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## IMPACTS OF A RELATIONSHIP MODEL ON INFORMATIONAL TECHNOLOGY GOVERNANCE: AN ANALYSIS OF MANAGERIAL PERCEPTIONS IN BRAZIL

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### ABSTRACT

The aim of this article is to analyze the impacts, based on the perceptions of managers, of the deployment of a model to govern the relationship between business areas and IT in a large Brazilian financial organization. To undertake the case study of this deployment, the research firstly performed documental analyses of the process and then sent electronic surveys to a sample of managers in order to evaluate their perceptions of the model's impact in terms of the formalism of the organization's internal processes, strategic alignment between business areas and IT and levels of governance in the organization. The results revealed that managers perceived improvements in the quality of technological solutions, levels of IT governance, the understanding of IT area needs and business area demands, but they also stated that the negotiating process was more complex and there was no increase in their level of satisfaction with IT. These results of the study may contribute to the development of instruments for the evaluation of the impacts of the deployment of relationship models on important organizational aspects.

**Keywords:** Information Technology; IT Governance; IT Alignment; Relationship Model; IT Strategy

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## 1. INTRODUCTION

The Information Technology (IT) area is becoming increasingly important in organizations, whether as a main activity or a facilitator of a firm's business and to make business processes more agile. In the banking sector specifically, the reconfiguring of IT from mere back-office functions to its current position as a fundamental element of electronic banking reflects this growing importance. According to the 2010 figures from the Brazilian Bank Federation (Federação Brasileira de Bancos [Febraban], 2011), the main relationship channel with bank customers was self-service, which accounted for 32% of the 55.7 billion bank transactions performed followed by Internet-based transactions with a 23% share, with 27.8 million mainly individual customers using internet banking. According to this entity the banking sector's TI-related investments and expenditures totaled more than 22 million BRLs in 2010, representing a 15% increase over the previous year, thus revealing a solid growth in total IT and communication expenditure (Febraban, 2011).

This importance, shown by the fact that the banking industry is one of the biggest investors in IT worldwide and Brazil's largest consumer of IT products and services (Faria & Maçada, 2011), makes it crucial to perfect processes in order to align IT efforts with the strategic importance represented by each initiative in business terms, establishing the criteria governing competition between business areas according to the prioritization of IT activities. Determining which demands should take priority constitutes an important challenge for IT and business areas, either because initiatives with a greater potential return may be difficult to implement (Graeml, 2000) or due to the intangible nature of the services or innovations produced.

The findings of an international survey showed that the 548 executives who were consulted considered that there was still a significant gap between corporate IT area expectations and performance, and professionals of this area were recommended to improve their knowledge of business demands (Roberts & Sikes, 2008). In Brazil, Rodrigues, Maccari and Simões (2009) found a similar gap in a survey that focused on IT executives of the country's 100 largest firms.

Thus, IT governance can be used to foster the alignment between Information Systems (ISs) and business strategy, in addition to improving the performance and contribution of these systems to operational performance (Dameri & Perego, 2010). IT governance appeared during the 1990s and rapidly became an important instrument for promoting this alignment and the integration of organizational activities with IT (De Haes & Grembergen, 2004).

Although organizations, when deploying a model to govern the relationship between business areas and IT, focus initially on improving the strategic alignment between these areas, they also aim at achieving improvements in IT area processes. When business areas and the IT area work in a collaborative fashion to improve IT processes, the value added to the business tends to be proportionately greater (Graeml, 2000).

### 1.1 Research problem and objectives

The aim of this article is to analyze the benefits and limitations resulting from the deployment of a model to govern the relationship between business areas and the IT area, characterized as an IT governance mechanism, based on the perception of holders

of management positions. The term “relationship model” is used in the sense of a systematic approach aimed at developing norms for governing the relationship between the cited internal areas of organizations and this systematic approach can be reproduced as long as certain conditions are present. The methodology was based on a case study of a large Brazilian financial firm which observed and analyzed the perception of managers before and after the introduction of the relationship model, regarding the extent to which its implementation facilitated the alignment between IT project priorities and organizational strategy.

Before 2004, negotiations to prioritize IT initiatives in this firm occurred directly between business area customers and the internal areas of the IT division. No attempt was made to align the priorities to be given to these initiatives with the business strategies and investments as a whole or align them inside each business area. This situation led to constant interruptions in the development of technology demands due to the need to cater urgently to a demand that was considered to have a higher priority.

Seeking to improve its governance structures in this area the organization has developed and deployed, as of 2005, a model to govern the relationship between business areas and the IT area. This model attributes the responsibility for prioritizing demands directed to the IT area to the business area itself which bases its decisions on the corporation’s strategy. The model is operationalized through periodic meetings between executive managers of the firm’s business and IT areas, in which the prioritization of demands is aligned between areas.

The first section of this article, which consists of a bibliographical review, discusses the need for strategic alignment between business and IT areas, the contribution of IT governance, the relationship between these areas and the degree of formalism involved. The following section presents the method used, the relationship model analysed in the case study and the research hypotheses. The article proceeds with a section analyzing the study’s findings followed by the last section containing some final considerations.

## **2. THEORETICAL REFERENCES**

### **2.1 Relationship between business areas and IT**

The significant impact that IT investments and their decision-making processes have on an organization’s success (Dean & Sharfman, 1996; Devaraj & Kohli, 2003) and the difficulties encountered in aligning the expectation of business area and IT managers (Roberts & Sikes, 2008), make it fundamental to understand how organizations govern their investment decisions in this sphere (Xue et al., 2008). Given the strategic importance of this type of decision and the financial resources involved, firms have to refine their IT initiative selection mechanisms and various management tools have been used to involve and create awareness among business executives regarding IT-related decisions (Lunardi & Dolci, 2009).

The IT investment decision process consists of a sequence of actions that begins with the identification of a problem associated with systems, thus opening up an opportunity and culminating with the approval of an IT project (Boonstra, 2003). An IT investment prioritization mechanism should be based on the return of projects and assets for the organization and in their alignment with business objectives (Fernandes & Abreu, 2006).

Given that a variety of organizational actors influences the decision-making process, it is not enough to consider only final deciders, as this could generate a reductionist view of the IT investment decision process (Xue et al., 2008). All the main parties involved should be considered as part of the decision process – all the way from the pre-deciders, who make the IT investment proposals, to final deciders. Prahalad (2006) defends the potential of Chief Information Officers (CIOs) as facilitators of the implementation of business strategies through the use of IT operational excellence processes. Their functions are to assure the transformation of business through IT's aligned strategies.

It is important to highlight that these deciders may face limitations in their choices as in the case of regulated sectors. Facó, Diniz and Csillag (2009) observe that the definition of a firm's competitive priorities is a function of the market and the operational resources available, which include information technology. In the case of banking, which is one of the economy's most regulated sectors, it is also necessary to consider the delimitations imposed by the regulatory framework on activities and strategic choices, with impacts on both decisions regarding operational resources and the actual appointment of deciders given that, as observed by Andrade (2005), in the case of Brazil, Central Bank authorization is necessary for appointments to the bank's statutory bodies.

IT's effectiveness depends on the way it is organized and conducted within the parameters of a business. These are precisely the middle-level functions that link the operational base to the strategic top management. To achieve this, Lutchen (2003) advocates six critical steps: (1) CIOs should understand the firm's business and align IT with the fundamentals of this business; (2) CIOs should administer IT as a distinct business which supports corporate objectives and sustains its profits; (3) CIOs should link IT strategy to the strategy of the business in a pragmatic way, adjusting their processes with quality and efficiency; (4) CIOs should help business units to define their needs (and risks), improving their services through controlled and efficient management; (5) CIOs should consolidate a high quality, result-oriented customer service culture in IT; and (6) CIOs should be compensated based on the contribution of their IT initiatives to the firm's profitability.

Executives should recognize the IT's status as a primary factor of production and make it a top management responsibility, instead of isolating it as a technical segment, distant from leadership (Raghupathi, 2007). There should be an effective exchange of ideas in firms and a clear understanding of the initiatives needed to ensure the success of corporate strategies, with a view to aligning IT investments with these strategies (Lunardi & Dolci, 2009). Fernandes and Abreu (2006) define strategic alignment between businesses and IT as a process that transforms a firm's business strategy into IT strategies and actions that seek to ensure that business objectives will be supported. As IT is able to enhance business strategies that could not be implemented without its help, this strategic alignment is bidirectional, i.e., from business strategy to IT strategy and vice-versa.

Lunardi and Dolci (2009) identified the following advantages of the IT area's involvement with other areas: (i) prioritization of IT projects according to business strategy, (ii) enhanced perception of IT's value, (iii) participation of IT in the formulation of the firm's strategy, (iv) visibility and transparency of the IT area and (v) planning of IT initiatives according to the firm's strategy. The authors affirm that the use of various mechanisms to support the prioritization of IT projects that are most

aligned with the firm's strategy increases the other areas of the organization's perception of the IT area's value.

Corroborating this view, Graeml (2000) affirms that IT's alignment with the firm's business is enhanced when IT assumes a strategic support role aimed at achieving organizational objectives. Based on the CMM (Capability Maturity Model), the author describes the partnership between the business and IT areas as being a function of the alignment existing between the former areas and the role of the organization's IT area. This alignment may be in a phase in which it is still conducted by the business area or in the phase in which the IT area initiates the creation of opportunities for these business areas. This alignment can also be well established with strong ties existing between these areas. In terms of the IT area's role in the organization, it may either act as a mere receiver of requests, as an area that provides consultancy services for business areas or as an area that collaborates with other areas of the organization. According to this same author (Graeml, 2000), the degree of partnership that exists between business areas and the IT area can be classified as "non-existent", "increasing" or "established".

In Brazil, there seems to be an alignment between IT and basic business processes, despite the evidence of a lack of synchronization. Rodrigues *et al.* (2009) studied the design of IT management in the largest 100 Brazilian firms and observed that 63% of them have formal IT plans aligned with their business plan, although only 30% update these plans. However, 37% of IT executives did not perform this alignment or did not recognize its importance and only 14% bothered to continuously update alignment indicators.

## **2.2 Strategic alignment and IT governance**

The growing importance of IT for firms makes it essential to perfect control mechanisms (Weill & Ross, 2006). Muhanna and Stoel (2010) observe that, in general, investors attribute a higher market capitalization to firms with a greater IT capacity, based on the view that this area contributes to improving an organization's future prospects in terms of size and risk associated with future returns.

The dynamic synchronization of business strategies and IT is not sufficient to guarantee IT's effective in terms of its contribution to the business (Shpilberg, Berez, Puryear, & Shah, 2007), given the possibility that alignment problems may occur. The authors warn about the possibility of inefficiency associated with the IT group's competencies, in a situation where the IT group understands business objective priorities but is unable to respond effectively with adequate technologies or solutions, thus producing an alignment trap. They suggest that attention should be paid to three determining factors of IT's effectiveness for business: emphasis on simplicity, correct and efficient outsourcing and adequate attribution of responsibilities. Laartz, Monnoyer and Scherdin (2003) sustain that if there is overall inefficiency in project execution (in terms of time and budget), there may be ineffectiveness in IT's alignment with specific and important business objectives. Even so, IT can still be aligned. Thus, competencies may need to be examined and not necessarily the alignment strategy in use (Rodrigues Maccari & Simões, 2009). In addition, one should be aware that various structures, processes and mechanisms related to IT effectiveness may function in a specific organization but not in others (De Haes & Van Grembergen, 2004; Dameri & Perego, 2010).

These alignment problems are taken into account in the sphere of IT governance, a concept that became a widely used yardstick during the 1990s when Henderson, Venkatraman and Loh used the term to describe the complex process of aligning IT

with the business (Loh & Venkatraman, 1993; Henderson & Venkatraman, 1993). IT governance contributes to a better alignment between ISs and business strategies in order to improve IS performance and results and reduce IT risk. It thus has a dual objective: to contribute to organizational performance and involve ISs more closely in the future challenges of the business (Dameri & Perego, 2010).

The IT Governance Institute (Information Technology Governance Institute [ITGI], 2009) affirms that IT governance consists of organizational and leadership structures, as well as processes, that ensure that a firm's IT area maintains and extends an organization's objectives and strategies. Weill and Ross (2006) define IT governance as the specification of decision rights and framework of responsibilities in order to encourage desirable behavior in IT use. Fernandes and Abreu (2006) call attention to the fact that IT governance seeks to encourage the sharing of IT decisions with other areas of an organization and is not restricted merely to the implementation of "best practices". Rau (2004), understanding governance to be the way in which an organization defines, monitors and achieves its strategies, considers that its application to the IT area assumes that its effectiveness is associated with the ability of technology investments to ensure that business objectives will be attained in an effective and efficient manner.

It is difficult to find a single definition for IT governance, but it usually encompasses: alignment between information systems and business strategy, strategic decisions regarding investments in IT and IS and the generation of value through the use of IS in business (Dameri & Privitera, 2009; Luftman, 1996; Van Grembergen, De Haes, & Guldentops, 2004; Weill & Ross, 2006).

IT governance depends on multiple contingencies (Sambamurthy & Zmud, 1999): corporate governance model, corporate strategy, organization of the business, distribution of authority, etc. Xue et al. (2008) identified IT governance archetypes which varied according to the characteristics of IT investments in relation to the external and internal environments. Thus, one can perceive that it is important for IT governance mechanisms to be adequate for the firm in which they are being deployed, in order to fit in with the organization's other management mechanisms. Organizations should develop their own IT governance policies and procedures and disseminate them for implementation (Nolan & McFarlan, 2005; Raghupathi, 2007). Moreover, in order to deploy an effective IT governance system it is necessary to harmonize current functionalities with an orientation towards the future in IT investment decisions (Weill, 2004).

IT governance exists in all organizations that use IT given that, conceptually and despite its polysemic nature, governance "is about steering and the rules of the game" (Kjaer, 2004, p. 7), so that, independently of quality and its standards, it can be found in organized systems as the act or way of governing. However, the organizational quality and practices of IT governance varies among firms, depending on aspects such as whether rights and responsibilities are well distributed among appropriate people, whether formalized processes for important tasks are in place or whether there is adequate documentation (Simonsson, Johnson, & Ekstedt, 2010).

Thus, many firms are refining IT governance mechanisms in order to direct their expenditures in this area as a strategic priority. These firms initiated the deployment of IT governance so as to obtain alignment between business areas and the IT area, with the aim of generating value for the business (Fernandes & Abreu, 2006). Alignment is defined here as the degree of commitment of the IT group to the priorities of the

business, the allocation of resources and realization of projects and delivery of solutions that are consistent with the objectives of the business (Shpilberg *et al.*, 2007).

This alignment can be achieved by understanding that IT governance is part of corporate governance and by adjusting a model of IT governance according to best practices observed in the market (De Haes & Van Grembergen, 2004). Thus, IT governance is the responsibility of the management team as an integral part of corporate governance. Governance reflects the leadership, organizational structure and the processes that ensure that IT supports and enhances the organization's strategies and objectives (Raghupathi, 2007).

### **2.3 Advanced relationship: process formalism**

The evolution of IT's role in organizations – from providing technology to establishing a strategic partnership with business areas - has led this area to seek fresh ways of fulfilling its new role in organizations. In recent years, the duration of the business cycle and firms' technology cycle have both been reduced. However, this reduction in the time taken by the IT area to cater to business area demands has not been sufficient to correspond to the expectations and needs of other areas of the organization adequately. Thus, the perception is that the IT area is always late in terms of fulfilling business area demands (Graeml, 2000; Tavares & Thiry-Cherques, 2011).

According to Rodrigues *et al.* (2009), IT in Brazilian firms meets basic demands but is not equipped to use the best automated practices, acting much more according to a solution supplier logic than as a promoter of innovation. However, it is possible to observe a quest for new ways of achieving greater maturity in the governance mechanisms of its internal processes (Gartner, 2009). Through these improvements in IT processes, organizations are seeking, in conjunction with the other components of IT governance – organizational mechanisms and structures – to attain higher levels of efficiency in the IT area, achieve its strategic objectives and strengthen its role as strategic partner of business areas.

Organizations have increased the degree of formalism in the relationship between the business and IT areas especially in terms of the presentation of demands. The IT area has also increased its use of frameworks and market models (CMM, CMMI, MPS-Br, PMBoK, CobIT), in order to improve its internal processes and its quality, productivity, efficiency and communication with business areas, as well as also explore possibilities for innovation. Rodrigues *et al.* (2009), when researching Brazilian organizations, found that management is oriented towards systems (ITIL, COBIT) that do not optimize business processes. It is important to emphasize that models such as COBIT (Control Objectives for Information and related Technology): (i) are generic models, designed for a hypothetical firm; (ii) concentrate on SI audits; (iii) are instruments of control and not governance directives; (iv) are not adequate for aligning IS with strategy and to create value for the business based on ISs (Dameri & Prego, 2010).

Research undertaken in various countries by Deloitte Touche Tohmatsu (2009) into the balance between IT and business areas identified that firms are increasingly institutionalizing the relation between these areas and seeking the ideal point in this relationship. According to this study, this kind of formalized and structured management mechanism enables the IT area to listen to the needs of the business areas, thus constituting a good way of starting to align the organizations IT and business areas.

Khatri and Brown (2010) affirm that to design a governance structure it is necessary to identify fundamental decisions that need to be taken and those responsible for them. The authors show how structured and unstructured mechanisms can be used to deploy a governance structure. For example, a committee of business leaders can review and approve IT projects. Web portals can be used to disseminate procedures and policies. Compensation systems can be employed to reinforce the value the firm attaches to information assets.

### 3. METHODOLOGY

In order to identify benefits and limitations of the deployment of models to govern the relationship between business areas and the IT area, the research performed a case study of a large Brazilian financial firm in order to evaluate its managers' perceptions of the model. Data collection was based on documental analyses of the development and deployment of the model and the results of a questionnaire whose construction was based on hypotheses derived from the theoretical references and distributed electronically to a sample of managers.

#### 3.1. Definition of Research Hypotheses

The possible impacts of the deployment of this model governing the relationship between business areas and the IT area were divided into three categories of analysis, as shown below:

1. ***Formalism in the Organization's Internal Processes*** – this category evaluated the model's impacts on aspects related to the organization's internal processes. It is supposed that these impacts derive from the need to increase the degree of internal formalism in the execution of the organization's internal processes in order to support negotiations and enable them to be effective.
2. ***Strategic Alignment between Business Areas and IT***– in this category the results of the relationship model were evaluated in terms of impacts on the strategic alignment between the firm's business areas and the IT area. One may suppose that by fostering the alignment of IT initiatives with strategic directives, one of the consequences of the relationship model is to increase the perception of strategic alignment between these areas.
3. ***Levels of Governance in the Organization*** – in this category the research evaluated the perceptions of the relationship model's impacts on the organization's levels of governance. One may suppose that a relationship model that generated perceptions regarding both the formalism of the organization's internal processes and strategic alignment between the firm's business areas and its IT area should also be perceived as having had effects on the organization's levels of governance.

Based on the categories of analysis presented the research defined the following hypotheses:



No.	<b>Hypothesis: <i>In an organization with a relationship model instituted between business areas and the IT area,</i></b>	<b>Reasons/Consequences</b>
1	managers identify improvements in the quality of IT solutions developed.	The need for greater formalization in internal processes resulting from the adoption of a model of this kind should lead to the creation of more detailed and consequently better understood demands (on the part of business areas), as well as generating improvements in these areas' internal processes. One may suppose that some of the consequences of the deployment of a relationship model of this kind would include an increase in the perception of the quality of technological solutions developed an improvement in the organization's internal processes.
1.a	managers of the business areas identify an increase in the level of satisfaction of business area expectations on the part of the IT area.	
1.b	managers of the IT area identify a greater clarity in the demands passed on by the business areas to the IT area.	
2	managers identify an increase in the level of strategic alignment between areas.	As one of the objectives of the deployment of a model for governing the relationship between an organization's business and IT areas is to ensure that prioritized demands are the ones most aligned with the firm's corporate strategies, one may suppose that managers will perceive an increase in the level of this alignment.
2.a	managers of business areas know and understand the strategies and needs of the IT area.	
2.b	managers of the IT area know and understand the strategies and needs of the business areas.	
3	levels of IT governance and corporate governance are perceived by managers as being greater than without the use by the organization of this kind of model.	As a relationship model of this kind can be understood as an instrument of IT governance that can have an effect outside the organization, one may suppose that managerial perceptions in this regard will be enhanced.
3.a	managers of business areas understand that the organization's level of corporate governance are greater and that the risks represented to the organization by the IT area are known.	
3.b	managers of the IT area understand that the organization's levels of IT governance are enhanced and that the risks represented to the organization's business by the IT area are known.	

**Table 1 – Research Hypotheses**

### 3.2. Data Collection and Analysis

The research universe was composed of managers of the organization which constituted the object of the case study who worked in the areas that managed its business and technology. The research selected divisions and business units responsible for at least four technology solutions and, in the case of the technology division, all the areas responsible for the construction of technological solutions, both applications and infrastructure. 705 managers were selected from a universe of 1.000. They were each sent a questionnaire and 161 replies were received (22.84% of the total). In addition, documental research was conducted in the organization. The latter's aim was to describe and clarify the model used to govern the relationship between business areas and the IT area. The field research tool – an electronic questionnaire sent – was divided into the following sections:

Section	Objective	Operationalization
1	To obtain information about the respondent.	Selection of aspects such as number of years at the company and area, position, participation in relationship model meetings and knowledge of results.
2	Perform a general evaluation of the adequateness of the situation prior to the deployment of the model governing the relationship between IT areas and business areas.	Selection of the reasons given for their evaluation of the situation regarding the negotiation of IT demands in the organization before the relationship model.
3	Provide data to evaluate hypotheses related to the analytical category "Formalism in the Organization's Internal Processes".	Each of these sections was composed of 10 items for evaluation. The latter were evaluated once relating to the period before and once after the deployment of the model, with the difference between these periods being a consequence of this deployment. Each of the evaluations was performed using a Likert type scale of 5 items, in which respondents selected total inadequateness at one extreme and total adequateness at the other.
4	Provide data to evaluate hypotheses related to the analytical category "Strategic Alignment between Business Areas and IT".	
5	Provide data to evaluate hypotheses related to the analytical category "Levels of Governance in the Organization"	
6	Perform a general evaluation of the adequateness of the situation after the deployment of the model governing the relationship between IT areas and business areas.	Selection of the reasons given for their evaluation of the situation regarding the negotiation of IT demands in the organization after the relationship model.

**Table 2 – Sections of the Research Tool (Questionnaire)**

Sections 1, 2 and 6 of the questionnaire received a descriptive statistical treatment, aimed at (i) detailing the sample's profile, (ii) establish the level of adequateness of the demand negotiation process which existed prior to the deployment of the model under

evaluation and their main reasons and (iii) establish the level of adequateness of the situation regarding the negotiation of demands after the deployment of the relationship model and their main reasons. In the case of the remaining sections (3, 4 and 5), the research used two forms of evaluation for the research hypotheses: (i) a factorial analysis followed by an analysis of the difference between the averages of the groups formed by the situation before and the situation after the deployment of the model, and (ii) selection of significant variables undertaken by the authors according to face validity followed by an analysis of the difference between the averages of these groups.

#### **4. PRESENTATION AND ANALYSIS OF THE RESULTS**

##### **5. 4.1 Relationship Model**

The creation of a model to govern the relationship between business areas and the IT area sought to organize the requests and prioritization of IT demands in the firm. Before 2004 both the negotiation and prioritization of IT initiatives were based on direct negotiations between business areas customers and the internal areas of the technology division that were responsible for the application that automated the solution. This form of negotiation and prioritization hindered the alignment of the priorities of these initiatives with the organization's corporate and investment strategies and even alignment with the internal priorities of each business area. The effect of this situation on the IT area could be seen in the constant interruptions in the development of a specific technology demand owing to the need to urgently prioritize a demand that had been identified as having a higher priority than those currently being catered to.

As a result of this direct negotiation between business areas and the area responsible for the solution in the IT area, there was little formalism in the definition of demands, which would involve the simplification of specifications for the implementation of requests, given that those in charge of both the business area and the IT area had a thorough knowledge of the technological solution.

In order to organize the negotiation of IT-related demands between its internal areas, the firm developed a model to govern the relationships between the organization's business management areas and the IT area, which was deployed in 2005.

The first step in the creation of this new model as to assign a business manager to each of the organization's ISSs. Thus, all new needs or those that represent changes in systems are analyzed by the area that is responsible for specific business in the firm. The needs are then evaluated according to their degree of alignment with the organization's strategies and listed in order of priority. This list of demands is then forwarded to the IT area which assesses how each need can be met and the number of hours necessary to fulfill the demand.

After the IT area has performed its evaluation a final, monthly, prioritization meeting is organized joining all executive managers of the business area and the technology division. With the information regarding how each demand will be met and respective schedules now at hand, the business area maintains or alters the order of priority of its demands. The demand priorities negotiated during previous meetings can be changed due to the appearance of more urgent demands or the need to comply with a new law or norm. At these meetings participants also report the progress of demands prioritized in previous prioritization meetings.

## 4.2 Sample profile and descriptive analysis

The distribution of managers who replied to the 161 questionnaires according to their position in the organization is presented in Table 3. 24 managers of the business areas and one from the IT area stated that they did not have the knowledge or information necessary to evaluate the model and were removed from the sample, thus leaving only 136 valid questionnaires. In proportional terms, more IT area employees participated than those from the organization's business areas, or 33.17% and 13.72% respectively.

Area	Position	Quest. Sent	Quest. Replied		Valid Quest.	
			No.	%	No.	%
<b>Business Area</b>	General Manager	5	1	20.00%	0	0.00%
	Executive Manager	105	16	15.24%	8	7.62%
	Division Manager	392	76	19.39%	61	15.56%
	Team Manager	1	0	0.00%	0	0.00%
	<b>Area Total</b>	<b>503</b>	<b>93</b>	<b>18.49%</b>	<b>69</b>	<b>13.72%</b>
<b>IT Area</b>	General Manager	2	0	0.00%	0	0.00%
	Executive Manager	10	3	30.00%	3	30.00%
	Division Manager	48	18	37.50%	18	37.50%
	Team Manager	142	47	33.10%	46	32.39%
	<b>Area Total</b>	<b>202</b>	<b>68</b>	<b>33.66%</b>	<b>67</b>	<b>33.17%</b>
<b>Area Total</b>	<i>General Manager</i>	7	1	14.29%	0	0.00%
	<i>Executive Manager</i>	115	19	16.52%	11	9.57%
	<i>Division Manager</i>	440	94	21.36%	79	17.95%
	<i>Team Manager</i>	143	47	32.87%	46	3.17%
	<b>Overall Total</b>	<b>705</b>	<b>161</b>	<b>22.84%</b>	<b>136</b>	<b>19.29%</b>

**Table 3 – Questionnaire Respondents**

The descriptive data revealed the seniority of respondents: 94% of managers had worked at the company for more than 15 years and 40% for more than 25 years. It could be supposed that these executives' level of knowledge of the organization was correspondingly high. More than 70% of respondents affirmed that they took part or had already taken part in the relationship model's negotiation meetings, showing that they were familiar with the negotiation process. As regards respondents' level of knowledge of the results of the meetings, the research found that that slightly less than 70% of survey respondents knew about what was negotiated in the negotiation meetings. This percentage is more than 10 percentage points greater in the group of IT area managers (74.63%) than in the group of business area managers (63.77%). This

difference is possibly due to the fact that for the IT area the demands negotiated at these meetings constitute direct inputs for the planning of activities, whereas in the business areas monitoring is attributed to only some of the managers.

Table 4 presents the distribution of replies according to company area to the question that sought to evaluate the perception of respondents regarding the adequateness of the process involving the negotiation of demands between the business areas and the IT area, according to pre-defined reasons, before the implementation of the new relationship model, thus prior to 2004. Most managers considered that the previous situation was inadequate, mainly because strategic aspects of the requests were not considered and due to the lack of process formalism.

Reply	No.	%	Reason	No. *	Perc. of/ No.Repl
No reply	5	3.68%			
Inadequate	106	77.94%	Because direct negotiation between parties perhaps would not consider aspects such as the strategic importance of requests.	87	82.08%
			Because agility in the implementation of requests may cause system unavailability.	14	13.21%
			Because the lack of formalism may hamper the understanding of the request, which could cause problems in systems.	74	69.81%
Adequate	25	18.38%	Because the negotiation occurred directly between the business area and the person responsible for the application in the IT area without intermediations.	19	76.00%
			Because the agility one had to implement requests in the systems offset the problems resulting from lack of formalism.	17	68.00%
			Because the specifications for implementation of requests were simpler, given that responsible parties in both the business and IT areas had a deep understanding of the matter.	17	68.00%
<b>Total</b>	<b>136</b>	<b>100.00%</b>			

**Table 4 – Evaluation of the Situation Before the Relationship Model**

*Obs.: \* More than one reply was permitted*

After the deployment of the model the research found a significant difference regarding the perception of the model’s adequateness, with the managers of the IT area recording the perception of a higher level of adequateness. Table 5 presents the reasons selected by respondents to evaluate the model’s adequateness or inadequateness. The main reason given for justifying the inadequateness of the new model, given by 45 of the 71 managers who considered the model to be inadequate, or 63.38% of this group,

related to the fact that demands were prioritized by the business area responsible for managing the IT solution, thus enabling their interests to take precedence over the need for alignment with the organization's strategy. On the other hand, among the reasons given for justifying the perception of adequateness, one should highlight the attribution to business areas of the responsibility for prioritizing demands for applications under their responsibility.

Reply	No.	%	Reason	No*	Perc. of/No.Repl
No Reply	3	2.21%			
Inadequate	71	52.21%	Because it added complexity to the process by obliging business areas to first of all negotiate with the solution management area.	28	39.44%
			Because it permitted new prioritizations on very short notice, perhaps causing the suspension of activities.	20	28.17%
			Because it did not permit the prioritization of demands that were more aligned with the organization's strategy, privileging instead the demands of the business area that manages the solution.	45	63.38%
			Because it permits prioritizations outside the negotiating process, then reducing the transparency of the process.	31	43.66%
Adequate	62	45.59%	Because it stipulates business areas that are responsible for the prioritization of demands for applications under their responsibility.	51	82.26%
			Because it permits the reformulation of prioritizations at relatively brief intervals, which is fundamental for the dynamism of a firm in the financial area.	36	58.06%
			Because it permits the prioritization of demands that are more aligned with the company's strategy, which can be demonstrated by the good results obtained by the organization.	39	62.90%
			Because, in exceptional cases, it allows the negotiation to take place outside the negotiating agenda in order to make the process more agile.	34	54.84%
<b>Total</b>	<b>136</b>	<b>100.00%</b>			

**Table 5 – Evaluation of the Situation After the Relationship Model**

*Obs.: \* More than one reply was permitted*

Table 6 shows a comparative evaluation of the adequateness of the negotiation process before and after the deployment of the relationship model, revealing a significant improvement in perceptions of adequateness on the part of IT area managers. However, this was not observed in the case of business area managers:

Area	Reply	Before the Model		After the Model	
		No.	Perc. of/Area	No.	Perc. of/Area
<b>Business Area</b>	No reply	5	7.25%	2	2.90%
	Inadequate	40	57.97%	41	59.42%
	Adequate	24	34.78%	26	37.68%
	<b>Total Business Area</b>	<b>69</b>	<b>100.00%</b>	<b>69</b>	<b>100.00%</b>
<b>IT Area</b>	No reply	0	0.00%	1	1.49%
	Inadequate	66	98.51%	30	44.78%
	Adequate	1	1.49%	36	53.73%
	<b>Total IT Area</b>	<b>67</b>	<b>100.00%</b>	<b>67</b>	<b>100.00%</b>
<b>Area Total</b>	<i>No reply</i>	5	3.68%	3	2.20%
	<i>Inadequate</i>	106	77.94%	71	52.21%
	<i>Adequate</i>	25	18.38%	62	45.59%
	<b>Overall Area Total</b>	<b>136</b>	<b>100.00%</b>	<b>136</b>	<b>100.00%</b>

**Table 6 – Comparative Evaluation of Situations Before and After the Model**

### 4.3 Verification of the research hypotheses

The evaluation of the research hypotheses was performed using distinct methods. In the case of hypotheses 1, 2 and 3, the variables linked respectively to sections 3, 4 and 5 of the research tool, presented in Table 2, were grouped using factorial analysis - the aim of this procedure was to identify factors or dimensions underlying the data that summed up the evaluations (Hair, Anderson, Tatham, & Black, 1998) – and the research performed a difference of means test. For the other hypotheses, derived from the previous three, the variables were grouped, based on documental analysis, according to their face and construct validity (Babbie, 1995) in order to identify the variables that best summed up what the research was trying to measure with each of these hypotheses. The research thus used two forms of evaluation for the research hypotheses: (i) a factorial analysis followed by an analysis of the difference of means between the groups formed by the situation before and the situation after the deployment of the model and (ii) selection and grouping of significant variables – undertaken by the researchers - followed by an analysis of the difference of means between these groups.

The data grouped around factors, whether supported by the factorial or qualitative analysis, were substituted by the arithmetic average of the components of the new

factors/groups, and some missing values were replaced by averages, thus computing compound averages. (Hair *et al.*, 1998).

As a result of the factorial analysis process, the following factors – two for each of the main hypotheses (1,2 and 3) – were extracted to evaluate these research hypotheses: (i) “Internal Processes” and “Perception of Quality” factors related to hypothesis 1, (ii) “Strategic Prioritization of Demands” and “IT Area – Business Area Relationship” factors related to hypothesis 2, and (iii) “IT Governance” and “Perceptions Outside the Organization” factors related to hypothesis 3. The reliability of factors and groups of variables verified by Cronbach’s Alpha attained values of over 0.7 in all cases, thus above the acceptable limit (Hair *et al.*, 1998).

The evaluation of the differences between the averages of the factors and the groups of variables in the situations before and after the deployment of the relationship model used the non-parametric statistical test - Wilcoxon signed-rank test for matched pairs - in order to analyze differences between paired observations and which take into account the magnitude of differences (Malhotra, 2006). Thus, the test exhibits the number of negative differences, positive differences and equalities between the paired evaluations and also presents the probability associated with the Z statistic which, when lower than the level indicating the probability of occurring unwarranted rejection of the null hypothesis – significance level defined in this case as 0.05 – indicates a statistically significant difference.

Evaluating the significance level of the Z statistic, associated with the Wilcoxon tests, applied to the factors and groups of variable cited, it was possible to verify that, with the exception of the “IT Area- Business Area Relationship” factor and the group of variables related to hypothesis 1.a, the significance levels were lower than 5%, indicating significant differences between the averages. In the case of the factors/groups of variables that showed a significant difference, the research also verified that, in most cases, the evaluations relating to the situation after the deployment of the relationship model were considerably more favorable than in the case of the previous situation, thus evidencing perceptions of the model’s adequateness. Table 7 presents, for each hypothesis, the averages of the evaluations before and after the model. The averages of each of the factors related to the main research hypotheses and the groups of variables related to the additional assumptions are shown in the following table.

Hypothesis/Factor	Before / After the Model do Modelo	Qty.	Average	Sig. Dif.
Hypothesis 1 – Factor “Internal Processes”	Before	130	2,495	
	After	130	3,251	*
Hypothesis 1 – Factor “Perception of Quality”	Before	130	3,208	
	After	130	3,447	*
Hypothesis 2 – Factor “Strategic Prioritization of Demands”	After	128	2,396	
	After	128	3,162	*
Hypothesis 2 – Factor “IT Area- Business Area Relationship”	Before	128	3,040	
	After	128	3,099	



Hypothesis 3 – Factor “IT Governance”	Before	128	2,129	
	After	128	3,110	*
Hypothesis 3 – Factor “Perceptions Outside the Organization”	Before	115	2,304	
	After	115	3,276	*
Hypothesis 1.a	Before	63	3,107	
	After	63	3,223	
Hypothesis 1.b	Before	67	2,186	
	After	67	3,283	*
Hypothesis 2.a	Before	62	2,782	
	After	62	3,137	*
Hypothesis 2.b	Before	65	1,961	
	After	65	3,100	*
Hypothesis 2.c	Before	128	2,896	
	After	128	3,172	*
Hypothesis 3.a	Before	60	2,539	
	After	60	3,282	*
Hypothesis 3.b	Before	67	1,798	
	After	67	3,115	*

**Table 7 – Averages of the Evaluations of the Situations Before and After the Model**

\* P < 0,05

Thus, based on the tests performed, one can affirm that at a significance level of 5%, the averages between the groups are different for all factors, with the exception of the “IT Area – Business Area Relationship”, for which the null hypothesis of equality of means was not rejected, and for the group of variables related to hypothesis 1.a. Thus hypotheses 2 and 1.a. were rejected. In the analysis of hypothesis 2.a. owing to the large number of equalities, it was possible to conclude that the relationship model had only a moderate effect on this group of variables, although the hypothesis was confirmed.

Analyzing the overall results, one can see that, in all cases, the averages of the evaluations of the situation before the deployment of the model, performed by the business areas for all factors used to evaluate the main hypotheses, were greater than the averages of the evaluations of this same period performed by IT area managers. In other words, the perception of business area managers in relation to the situation before the model was more favorable than that of IT area managers.

While in the case of IT area managers the comparison of the situations before and after the deployment of the relationship model, measured by the averages of factors, shows an increase in the perception of adequateness in the case of all factors, business area managers only perceived this in the case of four factors (“Internal Processes”, Strategic Prioritization of Demands”, “IT Governance” and “Perceptions Outside the

Organization”). Table 8 summarizes the results of the evaluations of the research hypotheses, indicating which were confirmed or rejected:

No.	Hypothesis: <i>In an organization with a relationship model instituted between business areas and the IT area...</i>	Evaluation
1	managers identify improvements in the quality of IT solutions developed.	Confirmed
1.a	managers of business areas identify an increase in the level of satisfaction of business area expectations on the part of the IT area.	Rejected
1.b	managers of the IT area identify a greater clarity in the demands passed on by business areas to the IT area.	Confirmed
2	managers identify an increase in the level of strategic alignment between areas.	Rejected
2.a	managers of business areas know and understand the needs of the IT area.	Confirmed
2.b	managers of the IT area know and understand the strategies and needs of business areas.	Confirmed
2.c	managers perceive IT as a strategic partner of the business areas and not as a mere technology provider.	Confirmed
3	levels of IT governance and corporate governance are perceived by managers to be greater than without the use by the organization of this kind of model.	Confirmed
3.a	managers of business areas understand that the organization’s levels of corporate governance are increased and that the risks to the organization represented by the IT area are known.	Confirmed
3.b	managers of the IT area understand that the levels of IT governance are enhanced and that the risks to the organization’s business represented by the IT area are known.	Confirmed

**Table 8 – Results of the Evaluations of the Research Hypotheses**

## 5. CONCLUSION

One of the aims of IT governance, considered in conjunction with its associated mechanisms, is to facilitate alignment between ISs and business strategies. The case study presented in this paper, considering a relationship model designed to facilitate the selection and prioritization of IT projects, made it possible to demonstrate the validity of the hypotheses formulated - based on a review of the literature - regarding the model’s positive impacts. The managers of the organization, as a result of the deployment of this relationship model, were able to perceive improvements in the quality of the technological solutions developed, an increase in the levels of IT and organizational governance and the value of the IT area as a business partner. The managers of the IT area recorded a greater clarity in the demands made by the business areas, an increase in the levels of knowledge and understanding of the strategies and

needs of the organization's business areas and an increase in the levels of governance and risks involved in IT.

However, the managers in the sample did not observe an increase in the level of strategic alignment between the areas of the organization with the introduction of the model which could be attributed to the greater complexity resulting from the greater number of stages and actors involved. It is significant to also observe that managers did not identify an increase in the business areas' level of satisfaction regarding their expectations relating to the IT area. The results showed that for these managers the benefits expected from the deployment of the model were not perceived by the business areas to the same extent as by the IT area.

It is possible that the organization's business areas lacked adequate resources to cope with the greater complexity resulting from the new relationship model and which would have reduced the costs of adaptation and given the managers of these areas a clearer perception of the gains obtained from the implementation of this process. But it is also possible to suppose that other variables influenced managers' perceptions, such as the power relations between areas, past conflicts or even the actual training of managers related to the development of competencies in aspects necessary for the definition of models and the negotiation of prioritization agreements. Future studies could monitor other variables and contingent factors that could influence managers' perceptions.

The main contribution of this study lies in the evaluation of the way a relationship model of this kind affects some organizational aspects, such as (i) the quality of the organization's technological solutions, (ii) strategic alignment between the business areas and the IT area – contributing to the development of a closer degree of partnership between these areas –, (iii) management of the risks of technological solutions in the firm and (iv) the organization's levels of governance. The results described can be applied to various types of large organizations that also have a great number of business areas which demand technological solutions and need to develop their IT governance processes. These organizations can understand the impacts of this type of relationship model, obtaining information that could be useful for drawing up their own IT governance strategies.

However, one should consider the fact that the efficient functioning of these kinds of models depends on various contingent factors (Sambamurthy & Zmud, 1999; De Haes & Van Grembergen, 2004; Xue et al., 2008, Dameri & Perego, 2010) and this imposes limitations on the results of this research that are inherent to the case study method, given that it records only the contingencies of the firm and sector chosen. Moreover, the choice of an organization in the banking sector means that one should also consider the limitations imposed by the sector's high degree of regulation on the firm's strategic choices and decisions regarding operational resources.

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