International Business Research; Vol. 7, No. 3; 2014
ISSN 1913-9004 E-ISSN 1913-9012
Published by Canadian Center of Science and Education

# Developing IT Governance in Brazilian Public Organizations

Paulo Henrique de Souza Bermejo[1], Adriano Olímpio Tonelli[2] & André Luiz Zambalde[1]

[1] Department of Computer Science, Universidade Federal de Lavras, Brazil

[2] Departament of Management, Instituto Federal de Educação, Ciência e Tecnologia de Minas Gerais, Brazil

Correspondence: Paulo Henrique de Souza Bermejo, Department of Computer Science, Universidade Federal de Lavras, Lavras, M.G., Brazil. Tel: 55-35-3829-1545. E-mail: bermejo@dcc.ufla.br

Received: January 6, 2014 Accepted: January 26, 2014 Online Published: February 24, 2014

doi:10.5539/ibr.v7n3p101 URL: http://dx.doi.org/10.5539/ibr.v7n3p101

**Abstract**

This paper presents a method for developing IT governance in public organizations. The method was developed in a deductive way from the confluence of theories of IT governance, participative management, strategic management and planning, and public value. Qualitative data about the method application in five Brazilian public organizations showed that the proposed method allowed these organizations develop IT governance aligned with specific demands of this sector. Based on these case studies, results show patterns of demands for IT and IT governance mechanisms in studied organizations. This work contributes to better understand on how to strategically align IT to public organizations value proposal.

**Keywords:** IT governance, public sector, information systems strategy, public value, information technology, strategic management

## 1. Introduction

The IT Governance has consolidated itself as an important topic for organizations to achieve IT strategic alignment, return on IT investment and value delivery (ITGI, 2007; Van Grembergen & De Haes, 2008; Weill & Ross, 2004). On public sector context, this reality isn't different. IT governance has gotten increased attention specially motivated by demands to put in effect reforms to modernize public management (Alford, 2002; Ali & Green, 2007; Campbell, McDonald, & Sethibe, 2009; Suomi & Tähkäpää, 2004).

As long as the public management modernization efforts advance, governments have each time more attention to points related to performance management, public expenditures transparency, control and efficiency on public services (Almqvist, Catasús, & Skoog, 2011; Jääskeläinen & Lönnqvist, 2011). Inside this context, IT governance become an important component directed to IT utilization as a key resource to aggregate value to public services offered by the State to people.

Despite its importance for public management, the application of IT governance models, frameworks and methods have been permeated by limitations and challenges. From the point of view of research on IT governance, few works have been conducted on a way to investigate which mechanisms contribute to IT governance on this type of organization (Ali & Green, 2007). Additionally, the comprehension about how to implement an IT governance on a manner to enable strategic alignment and value delivery to public organizations is still deficient (Ali & Green, 2007; Weill & Ross, 2004). From the point of view of business management, traditionally, models of strategic management, business value propositions and performance indicators applicable to private companies have focused primarily aimed at financial issues involving revenue and profit (Lunardi, Becker, Maçada, & Dolci, In press; Polidano, 2000; Weill & Ross, 2004). However, the profile of public sector organizations points to different proposals of value and performance interpretation (Ferguson, Green, Vaswani, & Wu, 2013; Jääskeläinen & Lönnqvist, 2011). In large part, these questions are discussed in these organizations from benefits such as delivery of benefits to citizens, social welfare, adequate life quality and services for education and health (Moore, 1994; Peyvand & Gupta, 2005; Polidano, 2000).

Although models and IT governance practices available in literature (Ferguson et al., 2013; ITGI, 2007; Van Grembergen & De Haes, 2009; Weill & Ross, 2004) dealing with, in most cases, generic approaches applicable to private and public organizations in the conceptualization and definition of IT governance practices. However, researchers (i.e., Ferguson et al., 2013), have pointed that generic IT Governance models can have different perceptions when applied in public sector organizations, and so, adding special features of public organizations

in such models can consist of a major challenge.

In Brazilian context, government initiatives have been undertaken to improve IT governance in public organizations. Initiatives such as the creation of Instrução Normativa 4 and of Acórdãos do Tribunal de Contas de União (TCU) has demanded of the Brazilian public organizations the implementation of IT governance with a focus on delivering value to the citizen. Included in these requirements are: i) the adoption of IT strategic planning as a tool to promote the alignment of IT with corporate objectives; ii) transparency in the procurement of IT services and acquisition of IT resources, iii) information security, iv) management of IT personnel and v) monitoring and controlling IT performance (Brasil, 2010).

In front of this scenario, this work shows the follow research question: how IT governance can be implemented in public organizations and which specific mechanisms should be developed?

Specifically, the exposed issue considers the challenge of alignment between the development of guidelines of IT governance and specific characteristics of public sector organizations, including value concept peculiarities in this sector and the principles of participatory management. In Brazilian context, such challenge can be evidenced by the low performance of public organizations in relation to the proper development of IT governance. According to a survey conducted in 2010 by Tribunal de Contas da União, most Brazilian public organizations (57%) is in early stage of IT governance development (Brasil, 2010). Additionally, most indicators of IT governance have worsened since the survey in year 2007 (Brasil, 2010).

As long as IT governance aim, at least instance, the strategic alignment and value aggregation to business (ITGI, 2007; Van Grembergen & De Haes, 2009; Weill & Ross, 2004), it is necessary not just to understand the public value concept, but also how this concept fit in models and IT governance frameworks available on literature. In front of this challenge, the presented paper aims to propose and verify a method for IT governance planning and implementing on public sector. The proposed method was developed from a confluence of public value concept (Moore, 1994), participative management values (Huertas, 1996), IT strategic planning methods and theories (Amaral & Varajão, 2007; Boar, 1994; Earl, 2003; Lederer & Salmela, 1996; Lutchen, 2004) and IT governance (Sambamurthy & Zmud, 1999; Van Grembergen & De Haes, 2008; Weill & Ross, 2004).

## 2. Theoretical Background

### *2.1 IT Governance*

IT Governance can be defined as specification and application of decision rights, processes and communication mechanisms for IT direction and control, making information technology strategically aligned and possibility value delivery to business (Brown & Grant, 2005; Clark, 1992; ITGI, 2007; Weill & Ross, 2004). At this manner, according to Weil and Ross (2004), to implement IT governance, organizations must develop specific combinations of decision making structures, alignment process and communication approaches. So, these components must be developed illuminated by contingences associated to acting sectors, goals, regulatory environment, organizational environment and culture and desirable attitudes for IT use, in a way to direct IT function to a better strategic alignment and value delivery (Ahituv, Neumann, & Zviran, 1989; Brown & Grant, 2005; Clark, 1992; Tavakolian, 1989; Van Grembergen & De Haes, 2009). Considering this context, different tools have been developed for IT governance planning and implementing, including Cobit (ITGI, 2007), Balanced Scorecard (Kaplan & Norton, 1997), ITIL (OGC, 2007), ISO/IEC38500 rule (ISO, 2008) and IT Strategic Planning (Bermejo *et al.*, 2012), although that is not often cited on literature.

From IT governance fundaments (Sambamurthy & Zmud, 1999; Van Grembergen & De Haes, 2008; Weill & Ross, 2004) and ITSP concepts (Boar, 1994; Earl, 2003; Galliers, 1987; Lederer & Salmela, 1996), it is possible to classify IT Strategic Planning as an artifice to planning and implementing of decision structures, process and relationship mechanisms, beyond providing direction to align IT to business.

Following, will be describe IT strategic planning theory and models available on literature. From this description and joined to IT governance fundaments already presented, will be developed the model proposed at this work.

### *2.2 IT Strategic Planning: Concepts and Theory*

IT Strategic Planning can be defined as a management task that deals with considerations like information systems integration to corporate planning process, IT sourcing strategies g, applications development processes, among others (Galliers, 1987).

So, that is possible to associate ITSP to a dynamic process designed to IT strategic, tactical and operational structuring in front to business (Lutchen, 2004; Min, Suh, & Kim, 1999).

IT strategic planning theory, according Lederer and Salmela (1996), is based on seven components, as shown in

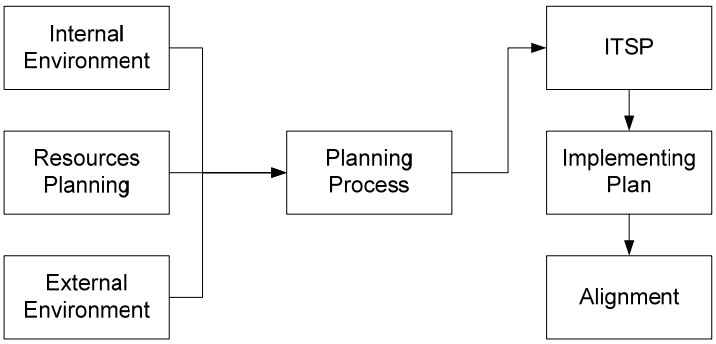


Figure 1. ITSP theory (Lederer & Salmela, 1996)

Figure 1.

Based on theory developed by Lederer and Salmela (1996), IT strategic planning (ITSP) is developed from a planning process influenced by internal environment characteristics (for example size, sector and organizational structure) and external (for example technological trends, customers and law) and by organizational resources planning (financial resources and people availability). ITSP, on the other hand, influence the implementation of IT strategies and IT-business alignment.

This ITSP theory highlights the importance of an ITSP process for IT business strategic alignment production. Faced to this perspective, a bunch of IT strategic planning methods have been proposed on literature (Amaral & Varajão, 2007; Boar, 1994; Lutchen, 2004). This can be justified by the importance of strategic planning on providing mechanisms for strategic alignment and IT direction in a proposal coherent to organizational demands and value propositions, at the same time that it takes care of internal and external environments and to organizational resources allocation.

Following, the public sector organizations main characteristics will be treat. Starting at this characterization and jointly to ITSP and IT governance review, the bases for the development of the method proposed at this work.

*2.3 Context of IT Governance at Public Organizations and the Search for Public Value*

Implement IT governance still consist on a challenge for public sector organizations (Weill & Ross, 2004), despite it being logically plausible and the existence of reports on literature. See examples on these studies on (Weill & Ross, 2004; Suomi & Tähkäpää, 2004; Campbell et al., 2009).

Traditionally, models for developing strategies focus on specific features such as market, customer profitability and competitors of private sector, not being adaptable to the realities of the public sector and nonprofit organizations (Moore, 1994; Weill & Ross, 2004).

Specifically, these models fail to capture a key feature of public sector organizations: the value produced on governmental organizations lies on social purpose achievement, instead of profit generation (Suomi & Tähkäpää, 2004).

Starting from these assumptions, public value concepts (Horner & Hazel, 2005; Moore, 1994; O'Flynn, 2007) could provide a more consistent comprehension of public organizations goals and of direction to implement IT governance.

Public value can be understood as a multi-dimensional construct that can be expressed by citizen preferences that are collectively expressed and politically measured (O'Flynn, 2007). Public value, including examples as economic prosperity, social capital increasing, cultural development, security and improved services, can be created from governmental actions (delivered services, laws and regulations), serving as performance measure criteria, decisions for resources allocation and public services delivery systems development (Horner & Hazel, 2005; O'Flynn, 2007).

Starting from public value notion and from its relevance for State management, suggest can be done that implementing IT governance activities at public sector must consider such construct as a main source for IT-business alignment.

Considering public value concept as the primary driver for IT governance, Weil and Ross (2004) and Campbell et al. (2009) identify the following related challenges to implement IT governance inside public and nonprofit

organizations: i) difficulty on measuring public value and performance; ii) IT architecture co-production between public organizations; iii) stakeholders different interests conciliation—customers, taxpayers and citizens. Related to this last challenge, Suomi and Tähkäpää (2004) highlight that the interest's conciliation of taxpayers—public activity sponsor—and customers and public services beneficiary must be on the center of definitions about public value and, consequentially, IT governance. Additionally, Campbell et al. (2009) identify the presence of multiples goals, higher regulation and fewer incentives to productivity as contextual factors that influence on public sector IT governance development. Starting at those challenges, Weil and Ross (2004) identify more efficient manners by which public and nonprofit organizations manage IT: promoting the alignment of value creation with the framework of IT governance, decision-making structures hybrid between business and IT to define principles and IT investment and decisions management about infrastructure as strategic to the business. On another work about IT governance on public organizations, Ali and Green (2007) analyze the influence of different mechanisms on IT governance performance. At evaluating different IT governance mechanisms inside Australian public organizations, Ali and Green (2007) identify the presence of IT strategic committees, performance measuring systems and corporate communication systems as having positive impacts on IT governance performance.

Although these studies had given significant contributions for IT governance comprehension at public sector, notes that Weil and Ross (2004), Ali and Green (2007) and Campbell et al. (2009) works, beside providing rich initial insights, they do not contribute at meaning of identifying and testing manners to implement IT governance in a way to consider alignment with public value purposes.

## 3. Methodology

This work is based on a qualitative research conducted by multiple case studies on five Brazilian public sector organizations.

The proposed method at this work was developed from a literature review related to IT governance, public value concept, IT strategic management, Information Systems Planning (ISP), and public management.

Once developed, the method was applied on five organizations from the Brazilian public sector, characterizing a simple random sampling (Jung, 2004). These organizations—that belong to different public management spheres—were selected considering their interest to provide required conditions for the case study to be conducted. It means, allow the full application of the proposed method, including support of high and middle level managers.

The focus defined to work in Brazilian organizations was motivated by the fact that they are submissive to a set of requirements for implementation of IT governance. In this sense, it is considered that this approach is appropriate as it captures organizations whose IT governance is an important requirement to justify IT investments and deliver public services to citizens.

Five groups formed by MBA candidates in IT Governance at Universidade Federal de Lavras, in southeastern Brazil, and the authors of this paper. All the selected students received training in IT governance topics and in the proposed method to allow them to develop the job.

During the method application, qualitative data were collect from IT leaders, top managers and managers of organizational sectors, from in-depth interview and focus groups. Once collected, the data were analyzed and structured according to proposed method prescribed models.

## 4. The Proposed Method

### *4.1 IT Governance Implementing Structure*

The structure for IT governance implementation, described at Figure 2, was developed based on IT strategic planning theory developed by Lederer and Salmela (1996). From this theory, concepts that reflect specific characteristics of public sector organizations were aggregated. The planning process, defined here by the method, is influenced by variables related to internal environment (public value, organizational and operational demands proposal), external environment (regulatory environment, technological tendencies and inter-firm integration demand) and to resources planning. The Strategic Planning was adapted to generate IT governance components combinations (structures, processes and relational mechanisms). The application results, ultimately, aim to align itself to public value and to the others internal, external and resources planning variables.

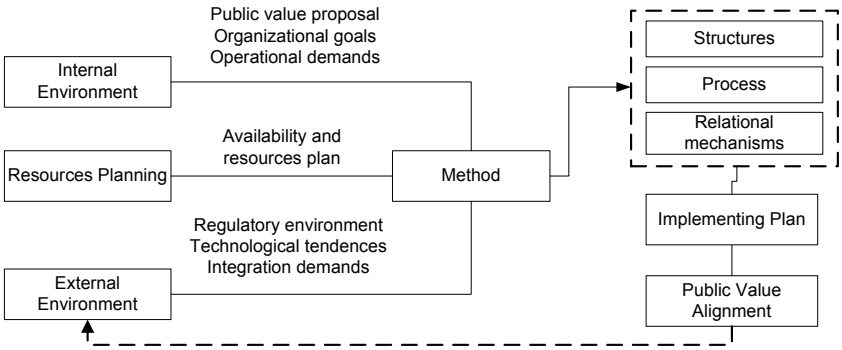


Figure 2. ITSP theory adapted to implementation of IT governance in the public sector

In what treat about contribution obtained from IT governance literature, initially were identified the decision-making structures (Sambamurthy & Zmud, 1999; Van Grembergen & De Haes, 2008; Weill & Ross, 2004), processes (ITGI, 2007; Van Grembergen & De Haes, 2008; Weill & Ross, 2004) and relational mechanisms (Van Grembergen & De Haes, 2008; Weill & Ross, 2004) that can be selected and developed on public organizations aiming to promote alignment and public value delivery.

*4.2 Method Description*

The proposed method is divided in seven phases (Figure 3) and is oriented to articulation of internal and external environments and resources planning for structure, process and related mechanisms development and implementing plan.

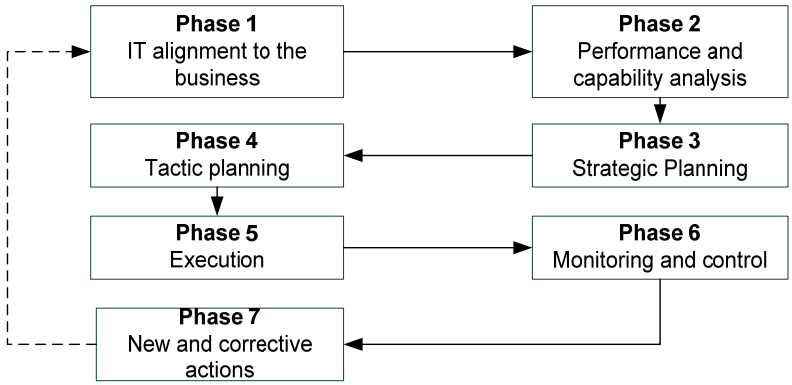


Figure 3. General overview of proposed method

Phase 1 is responsible for articulating the public value proposal, the organization goals and the resources planning for developing IT objects that will direct the IT contribution for strategic alignment and public value delivery. This phase is coherent with the first Van Grembergen and De Haes (2008) orientation and with Cobit hands-on approach (ITGI, 2007), where the IT governance implementation starts from business and IT definition.

In phase 2, technological tendencies and IT internal environment are evaluated, in a manner to identify current IT capacities and gaps that prevent the goal achievement and the value delivery. At this manner, this phase complete achieving: (i) assessment of the maturity of IT governance critical process, aiming to achieve IT goals and objectives (ITGI, 2007); (ii) SWOT analysis of IT resources applied to the critical processes; (iv) analysis of IT decision-making structures. These outcomes allowed identify gaps between the current status of IT Governance and the desired status.

Phases 3 and 4 were performed to define the strategic and tactical plans aiming to develop the IT governance. The strategic plan had, structured by balanced scorecards, actions to improve the maturity level of the critical processes, relational mechanisms and the structure to implement the performance management based on KPI and

KGI indicators. The tactical plans were created detailing actions organized by projects to implement the strategic plan. Phases 3 and 4 are coherent with Van Grembergen and De Haes (2008) following orientations for IT governance implementing: develop decision making structures, define IT governance process and manage and align investment portfolio.

In the phase 5, the project defined in the tactical plan were performed and in the phase 6, monitoring and control actions were performed aiming to identify deviations to be correct in the phase 7. Furthermore, in the phase 7, new demands also could be identified and be conducted to a new cycle of the method.

Looking to address concepts regarding public value, the method based took a participative focus involving a long range of people of the organizations, including IT leaders, high and medium level managers, and also collaborators representing different areas of the public organizations.

## 5. Results

This section presents the results of the method application in the studied public organizations. The results will be presented individually by each company and will consider the alignment between the proposed public value and institutional goals with IT goals and IT governance mechanisms derived from these goals.

Table 1 presents a description of the studied organizations. Fictitious names were adopted for confidentiality reasons.

Table 1. Sample description

| Nome | Description |
|---|---|
| Organization A | Federal court |
| Organization E | Federal agency for sanitary control |
| Organization H | Federal university |
| Organization K | Federal court |
| Organization Z | State court |

Following are reported the outcomes of the method application in these organizations.

### *5.1 Organization E: Defining IT Governance Processes*

Inside Brazilian context, the sanitary is characterized by its decentralization and articulation between National Sanitary System instances. So, this sector can be characterized by the autonomy and independency binomial.

At this context, strategic challenges appear to supply deficiencies related to sanitary control in Brazil, including: fragmented approach at performance field, few inter and intra-institutional articulation, insufficient information systems, unpreparedness on using existent information.

Against this background, public value proposition in Organization E must consider a high independency between different units spread by along all national territory.

Figure 4 shows the results related to definition of a process cycle for Organization E, based on public value, organizational goals and resource planning proposal.

By articulating organizational factors, organizational objectives and resource planning objectives (Figure 4), it was possible to define—during phase 1—a set of IT goals to drive actions that will implement IT governance in Organization E. Starting from these IT goals, a process framework was defined based on Cobit framework (ITGI, 2007), covering a cycle that comes from IT planning and organization (information architecture and IT investments that direct the infrastructure and services delivery), pass to resources acquisition and implementation (infrastructure and application acquisition and maintenance), delivery and services support (IT services management delivered through infrastructures to customer areas) and monitoring and evaluation (process framework performance measure in achieving IT goals).

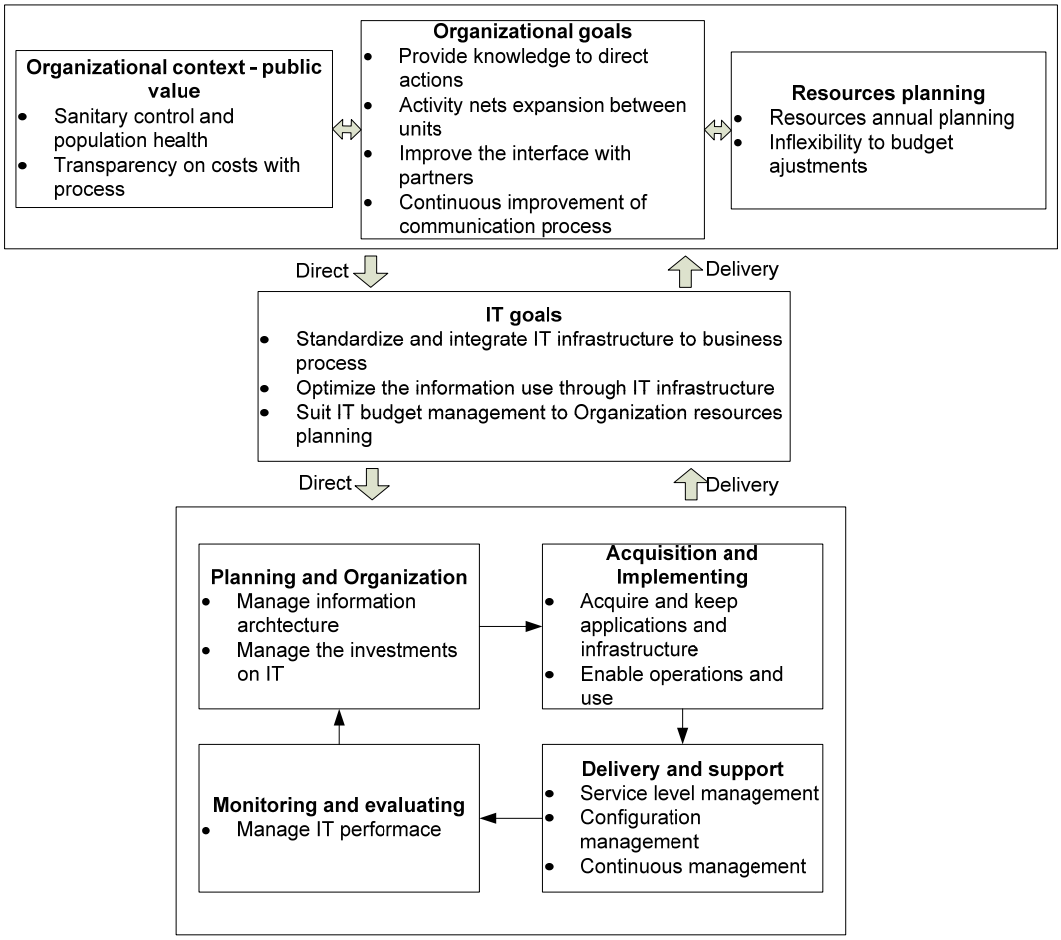


Figure 4. Alignment of the information technology and Organization E

*5.2 Organization H: Defining Decision Making Structures*

Inside Brazilian context, public higher education sector pass by a large transformation, characterized by the increasing of public federal universities. New courses, students and professors number increasing and campus expansion, often, for other cities, turn a lot of public universities distributed between two or more cities, representing an increase of the public value to citizens. Beyond the expansion to other cities, the universities have faced a current infrastructure expansion challenge, with increasing demands for applications integration and academic information management improvement. Based on this transformation, the Figure 5 shows the summary of the alignment of IT and business context and goals.

A participative situational analysis was done at phase 2 allowing the assessment of the IT governance structures. 25 high-level management representatives of the university were involved. This analysis revealed lack of alignment between the organizational context and business objectives defined in the phase 1. Middle level managers, that in most cases were not informed about the organization objectives individually, performed most of IT decisions. The analysis of IT decision-making structures showed that technical feasibility of IT decisions were not considered in most cases, resulting delays and inappropriate budgets in some cases. The lack of involvement of department representatives resulted in the lack of opportunities to establish more innovative actions for teaching and researching activities.

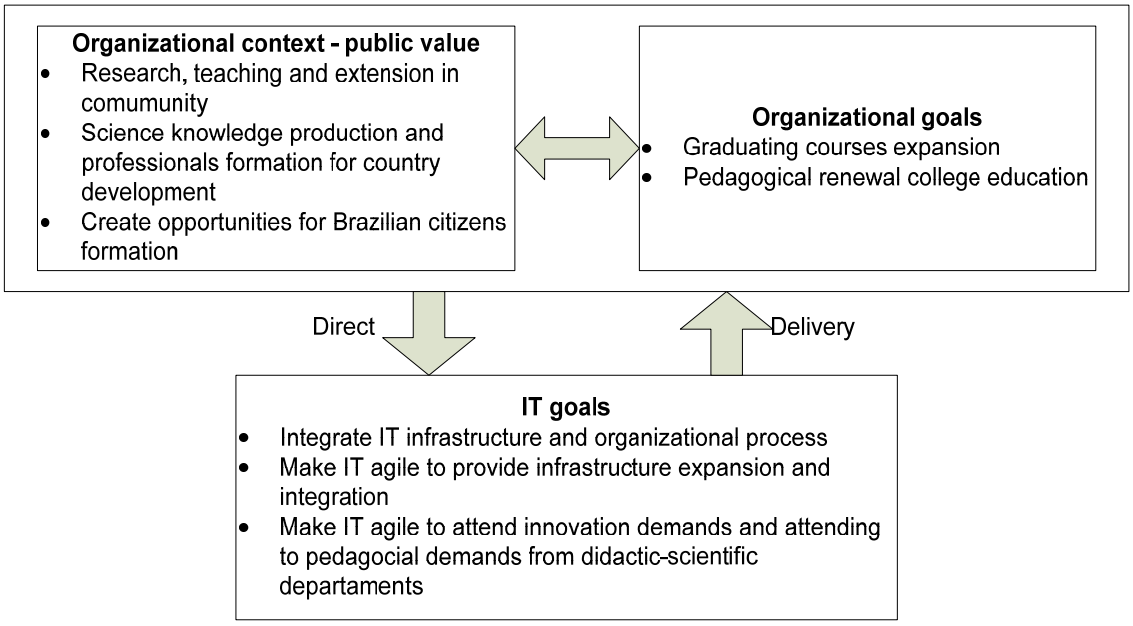


Figure 5. Alignment between information technology and Organization H

Considering the above outcomes, in the phase 3, it was proposed to create an IT Management Committee. Department Representatives and IT Director were also involved together the University high-level of management. This committee performed the following actions:

- Technical research to support IT investment decisions;
- Assessment of new technologies to support future decisions of investment for innovations;
- Continuous assessment of IT demands of the all departments of the university;
- Make available technical reports, plan for acquisition of IT resources and technical cooperation agreements with partners (service level agreement—SLA);
- Propose a set of priorities of IT shared services to the high-level manager (rector);
- Plan to expand information technology based on the growing plan of the university;

*5.3 Organization K: Defining Strategies for Relational Mechanisms Implementing*

According to phase 1 collection, data miss was identified as one of principal deficiencies to measure and support decisions related to efficient public politics planning for Brazilian public security. Such finding is consistent with Lima (2008) study that highlighted the availability of consistent information about crimes and criminals as the center in debates related to public security improvement on Brazil.

In Organization K, the application of the phase 3 resulted in a map containing perspectives for contribution to business, customers/stakeholders, internal process and learning and growth. This map contained a set of goals to achieve the organizational objectives. Public safety and crime suppression formed some objectives and represented the public value proposition. IT strategic actions to achieve these objectives were also defined, as they are shown in Figure 6. These actions were associated to encourage the gradual evolution of relational mechanisms until proper synergy is achieved among IT teams, senior management and business areas. Thus, IT governance can help achieve the IT objectives proposed for the organization as regards relational mechanisms.

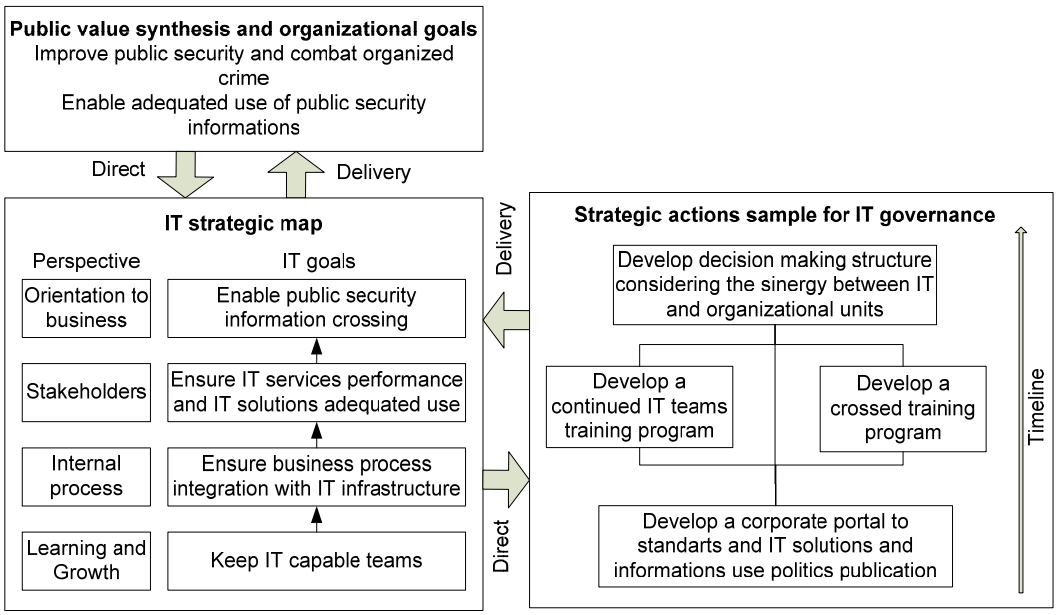


Figure 6. Public value drivers, strategic map and strategic actions proposed to implement IT governance in Organization K

*5.4 Organization Z: Defining Structures, Process and Relationships Mechanisms*

According to Maria Teresa Sadek (2009) published research, Brazilian judiciary system problems comes from the lack of management. So, system performance depends strictly on internal management. That is not sufficient having more judges, technological infrastructure and units, is necessary, so, an appropriated internal resources management (Sadek, 2009).

From these evidences about judiciary system slowness cause, IT governance implementing initiatives can be comprehended as being of large relevance for Organization Z, making IT as an important resource for the achievement of public value associated to make juridical process faster.

Facing with an increasing number of lawsuits, Organization Z has an urgent need to promote a more responsive justice. Considering this value proposal, IT objectives associated to the development innovative technological solutions and of an integrated and standardized IT infrastructure were proposed. Through new IT solutions and an integrated infrastructure to process information, judicial lawsuit could be accelerated.

Following the above mentioned IT objectives, a participative situational SWOT analysis of IT resources was conducted in phase 2 of the method. This analysis was applied applied in alignment with the theory of situational participative planning developed by Carlos Matus (Huertas, 1996). The participative analysis included representatives of the IT staff, functional managers and key IT users in Organization Z totalizing 30 participants.

Table 2 summarizes the main weaknesses, threats and opportunities appointed by the participants in the situational analysis. Together with the results of phase 1, the results of the participative situational SWOT analysis substantiate the development of strategic actions for decision-making structures, IT governance processes and relational mechanisms.

Table 1. Synthesis of the participative situational SWT analysis conducted in Organization Z

| **Weaknesses** |
|---|
| Inadequate service levels defined with functional departments due to: (1) the lack of a formal process for service level management; and (2) lack of mutual understanding between IT and functional departments. |
| **Threats** |
| Uncontrolled growth of IT |

| **Opportunities** |
| --- |
| Greater synergy among IT staff, functional areas and top management. |
| Participation of IT leaders in strategic planning decisions. |

Figure 7 illustrates the proposal to align public value, IT goals, and IT governance mechanisms in Organization Z. Based on a gap between the public value proposal, IT goals and internal IT capabilities identified during the phase 2, a set of strategic actions were proposed to develop adequate IT governance mechanism.

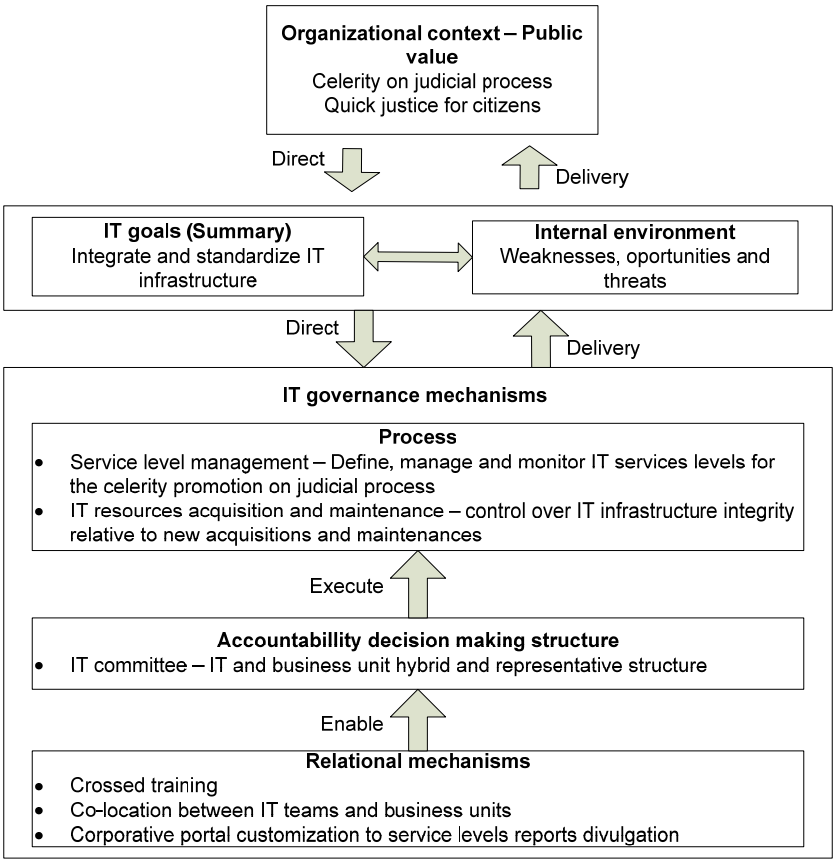


Figure 7. Alignment between public value proposal, IT goals and IT governance mechanism in Organization Z

## 6. Discussion

Based in the results described in the above section, this section will discuss the work contributions for the first two research questions posed: i) how to implement IT governance in public sector organizations? and ii) what are the specific mechanisms of IT governance for the public sector?

### *6.1 How to Implement IT Governance in the Public Sector?*

Considering the obtained results, the work suggests that, in the public sector, IT governance can be implemented through the articulation between the concept of public value, participatory management procedures, ITSP methods and IT governance mechanisms, as illustrated in the presentation and reports of the use of the method.

The study conducted in five organizations allowed to verify that the ITSP method allows to articulate public value and outcomes of participatory management mechanisms of IT governance—decision-making structures, processes and relational mechanisms—traditionally reported in the literature.

This work found that public value concept offer important direction to let public organizations contemplate IT governance key objectives. On contemplating such concept, IT governance implementation initiatives can perform a significant rule on directing information technology resources and people to society demands

treatment that is on State responsibility.

The participative management principles showed themselves as relevant as long they promote knowledge integration from different stakeholders to identify IT governance barriers on organizations. This can be verified specially on organizations H and Z, where the participation provide insights about inadequacy of decision making structures and integration inefficient, creating conditions for development of IT governance mechanisms destined to operational barriers overcoming and to alignment with organization value proposal.

The ITSP theory aggregation to method construction showed itself as being relevant to an organized structure creation, enabling to articulate and direct organizational factors, including, mainly, public value proposal, for development of IT governance mechanisms aligned to business and to organization value proposal. In this sense, while the ITSP provided a logic of planning guided by business demands and current state of IT, the ITSP served as a mechanism of articulation between the value propositions, the results of participatory management and IT governance mechanisms. Section 6.2 presents a discussion of the results aimed to answer the research question.

*6.2 What Specific Mechanisms of IT Governance in the Public Sector?*

The method application in studied organizations allowed to identify patterns of IT governance and related demands, providing an overview of which specific mechanisms need to be developed for implementation of IT governance in public sector organizations.

As can be observed on results, all studied organizations shows diverse public value proposals. However, on IT governance focus, among all four organizations, was found that these different values propose essentially translated itself on the following IT governance mechanisms:

- Hybrid decision making structures, organized essentially as duopoly archetypes;
- Mechanisms associated with relational and cross-training corporative portals, aimed at: i) improve communication between IT and organizational sectors and ii) develop skills necessary to IT decision making and execution of processes critical to IT governance;
- Processes essentially directed to acquisition, service quality and information architectures management;

From mechanisms profiles above cited, the need of giving a relational focus for IT governance on studied organizations is found. Such focus can be found from two factors: i) the importance of relational mechanisms to enable hybrid structures for decision making and IT and organization mutual understanding, as verified on organizations E, K and Z; ii) importance of decision making hybrid mechanisms, on duopoly form, aimed to promote a higher synergy of IT and "business" knowledge to support IT decision, as verified in organizations H and K.

Another important aspect verified at this work are the demands by infrastructure standardization and integration, in a way to delivery strategic information to let organizations offer to population systems aligned with respective public value proposes. At this sense, process for infrastructure acquisition and maintenance, IT services management and information architecture management could be detected. Once managed by collaborators capable as relational mechanisms and at hybrid decision making structures, such process aim an IT architecture maintenance coherent with standardization and integration demands and IT services delivery that, through IT structure, provide information according with organizational demands. Such relation can be observed in organizations E and Z.

Specifically about the context of the requirements for IT Governance Brazilian public organizations, the method application allowed the studied organizations the fulfillment of these requirements. In K Organization, for example, the method application has allowed the alignment between IT services hiring initiatives to IT strategic actions developed to support institutional goals and organization public value proposition. In this sense, the contracting of services for training program and corporate portal development aligns with institutional objectives associated with public safety and combating to organized crime. Additionally, the development of bases for aligning IT objectives and organization value propositions allowed developing directions for IT staff training. This could be seen especially in organizations K and Z, where cross-training programs (cross-training, i.e. public business process and IT process) were defined as essential to creating and sustaining capacity of IT on supporting public value proposition and institutional goals.

## 7. Conclusion

This paper presented and applied a specific method for implementation of IT governance in public sector organizations. In order to meet public sector peculiarities, the proposed method considered the linkage between (1) public value concept (Moore, 1994), (2) participatory management practices (Huertas, 1996), (3) ITSP method (Boar, 1994; Earl, 2003; Lederer & Salmela, 1996) and (4) IT governance mechanisms (ITGI, 2007;

Sambamurthy & Zmud, 1999; Van Grembergen & De Haes, 2008; Weill & Ross, 2004).

The results of the method application in five Brazilian public organizations showed that the linkage between these four components consists in an appropriate way to implement IT governance in public organizations. Additionally, the method application allowed verifying common patterns in terms of demand for IT and IT governance mechanisms, aligned with the achievement of organization value propositions.

On investigating IT at public value focus, this work contributes to better understand about how to strategically align IT to public organizations value proposal. At this manner, this work may offer important insights to let public organizations structure IT governance development initiatives, having as base the articulation of IT governance mechanisms, strategic planning theory and public value and participative management concepts. From this perspective, the presented work extends literature contributions related to IT governance implementation, specially the nine orientations to improve IT governance (Van Grembergen & De Haes, 2008), and the IT governance implementation guide (ITGI, 2007). It occurs specially by particularly consideration to public organizations demands.

Additionally, as long as processes, relational mechanisms and decision-making empirically identified, the work provide directions about which IT governance mechanisms can work better on public organizations. This work adds itself to Weil and Ross (2004), Suomi and Tähkäpää (2004), Campbell et al. (2009) and Ali and Green (2007) contributions, providing more evidences about mechanism profiles more adequate to public sector organizations reality.

Our results provide important contributions towards clarifying: (1) procedures of implementing in public sector IT governance mechanisms and (2) main demands for IT and IT governance in a group of Brazilian public organizations. So, in face of demands for a better understanding of how to implement IT governance considering the reality of the public sector, we believe that this work has great relevance and will spark interest in both practitioners and researchers involved in improvement projects and understanding of IT governance. In particular, we believe that the paper will arouse interest of those who seek to understand governance in emerging countries such as Brazil.

Finally, the contribution for extension of Moore (1994) public value concept to IT area on public organizations is highlighted. This can be considered of larger relevance as long as, as related on literature (Barzelay, 2000; Ferlie, Pettigrew, Ashburner, & Fitzgerald, 1996), information technology have coming each time more a tool to provide better services for citizens and public management improvement.

## 8. Limitations and Future Research

This research was conducted in a sample of 4 Brazilian public organizations. Furthermore, this research does not treat some post-implementations actions in the studies organizations. Therefore, further studies could investigate post-implementation aspects and the daily operations of the proposed IT governance mechanisms in the organizations. Additionally, in light of public value proposals, works could conduct exploratory researches in order to raise adequate metrics and indicators for IT governance in public management. Other new future researches could be done: Application of the proposed method on others Brazilian Public organizations in order to gain more insight about theories and concepts used in proposed method. Recommendations could be added to proposed method to enable treatment of occasional particularities in different spheres (municipalities, states and the federation) and types of organizations (for example, ministries, institutes, hospitals, banks, etc.). Another proposal for future research is the study inside different institutional contexts in different countries to verify possible different demands in terms of IT governance mechanisms and for adaptations in the proposed method.

## Acknowledgements

The authors would like to thank FAPEMIG (Minas Gerais State Foundation for Research Development), CNPq (Council for Scientific and Technological, Development), and CAPES (Coordination for the Improvement of Higher Level Personnel) for the financial support. A prior version of this paper was presented at the Hawaii International Conference on System Science (HICSS) in Kauai, Hawaii (Bermejo & Tonelli, 2011). The authors also thank the anonymous double blind reviewers of this conference, as well as the conference participants who attended the paper presentation in this conference and with the discussion they helped we to restructure, increment and improve the original paper.

## References

Ahituv, N., Neumann, S., & Zviran, M. (1989). Factors affecting the policy for distributing computing resources. *MIS Q.*, *13*(4), 389–401. http://dx.doi.org/10.2307/248722

Alford, J. (2002). Defining the client in the public sector: A social exchange perspective. *Public Administration Review, 62*(3), 337–346. http://dx.doi.org/10.1111/1540-6210.00183

Ali, S., & Green, P. (2007). IT governance mechanism in public sector organizations: An Australian context. *Journal of Global Information Management, 15*(4), 41–63. http://dx.doi.org/10.4018/jgim.2007100103

Almqvist, R., Catasús, B., & Skoog, M. (2011). Towards the next generation of public management: A study of management control and communication in the Swedish Armed Forces. *International Journal of Public Sector Management, 24*(2), 122–145. http://dx.doi.org/10.1108/09513551111109035

Amaral, L. A. M., & Varajão, J. (2007). *Planejamento de sistemas de informação*. Lisboa: FCA.

Barzelay, M. (2000). The New Public Management: a bibliographical essay for Latin American (and other) scholars. *International Public Management Journal, 3*, 229–265. http://dx.doi.org/10.1016/S1096-7494(00)00038-6

Bermejo, P. H. D. S., & Tonelli, A. O. (2011). *Planning and Implementing IT Governance in Brazilian Public Organizations.* 2011 44th Hawaii International Conference on System Sciences (HICSS), Kauai, HI, IEEE.

Bermejo, P. H. D. S., Tonelli, A. O., Zambalde, A. L., Brito, M. J. D., & Todesco, J. L. (2012). Implementation of information technology (IT) governance through IT strategic planning. *African Journal of Business Management*, *6*(45).

Boar, B. H. (1994). *Practical steps for aligning information technology with business strategies: how to achieve a competitive advantage.* New York: John Wiley.

Brown, A. E., & Grant, G. G. (2005). Framing the frameworks: A review of IT Governance research. *Communications of the Association for Information Systems, 15*, 696–712.

Campbell, J., McDonald, C., & Sethibe, T. (2009). Public and private sector IT Governance: identifying contextual differences. *Australian Journal of Information Systems, 16*(2), 5–18.

Clark, T. D. J. (1992). Corporate Systems Management: An Overview and Research Perspective. *Communications of the ACM, 35*(2), 61–86. http://dx.doi.org/10.1145/129630.129633

Earl, M. J. (2003). Approaches to information systems planning. Experiences in strategic information systems planning. In R. D. Galliers & D. E. Leidner (Eds.), *Strategic information management: challenges and strategies in managing information systems* (3rd ed.). Burlington: Elsevier.

Ferguson, C., Green, P., Vaswani, R., & Wu, G. (2013). Determinants of Effective Information Technology Governance. *International Journal of Auditing, 17*(1), 75–99. http://dx.doi.org/10.1111/j.1099-1123.2012.00458.x

Ferlie, E., Pettigrew, A., Ashburner, L., & Fitzgerald, L. (1996). *The new public management in action.* Oxford: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780198289029.001.0001

Galliers, R. D. (1987). Information systems planning in the United Kingdom and Australia: a comparison of current practice. In P. Zorkoczy (Ed.), *Oxford surveys in information technology.* New York: Oxford University Press.

Horner, L., & Hazel, L. (2005). *Adding Public Value.* London: The Work Foundation.

Huertas, F. (1996). *O método PES: entrevista com Carlos Matus.* São Paulo: Fundap.

ISO. (2008). *ISO/IEC 38500 Corporate Governance for Information Technology.* Switzerland: International Organization for Standardization.

ITGI, I. G. I. (2007). *COBIT 4.1: control objectives, management guidelines, maturity models.* Rolling Meadows: ITGI.

Jääskeläinen, A., & Lönnqvist, A. (2011). Public service productivity: how to capture outputs? *International Journal of Public Sector Management, 24*(4), 289–302. http://dx.doi.org/10.1108/09513551111133461

Jung, C. F. (2004). *Metodologia para pesquisa & desenvolvimento: aplicada a novas tecnologias, produtos e processos* (1st ed.). Rio de Janeiro: Axcel Books.

Kaplan, R. S., & Norton, D. P. (1997). *A estratégia em ação: balanced scorecard* (22th ed.). Rio de Janeiro: Elsevier.

Lederer, A. L., & Salmela, H. (1996). Toward a theory of strategic information systems planning. *Journal of Strategic Information Systems, 5*(3), 237–253. http://dx.doi.org/10.1016/S0963-8687(96)01046-3

Lima, R. S. (2008). *A produção da opacidade: estatísticas criminais e segurança pública no Brasil.* Novos Estudos 80.

Lunardi, G. L., Becker, J. L., Maçada, A. C. G., & Dolci, P. C. (In press). The impact of adopting IT governance on financial performance: An empirical analysis among Brazilian firms. *International Journal of Accounting Information Systems*. http://dx.doi.org/10.1016/j.accinf.2013.02.001

Lutchen, M. D. (2004). *Managing IT as a Business: A Survival Guide for CEOs.* Hoboken: John Wiley & Sons.

Min, S. K., Suh, E. H., & Kim, S. Y. (1999). An integrated approach toward strategic information systems planning. *Journal of Strategic Information Systems, 8*(4), 373–394. http://dx.doi.org/10.1016/S0963-8687(00)00029-9

Moore, M. H. (1994). Public value as the focus of strategy. *Australian Journal of Public Administration, 53*(3), 296–303. http://dx.doi.org/10.1111/j.1467-8500.1994.tb01467.x

O'Flynn, J. (2007). From New Public Management to Public Value: paradigmatic change and managerial implications'. *Australian Journal of Public Administration, 66*(3), 353–366. http://dx.doi.org/10.1111/j.1467-8500.2007.00545.x

OGC, O. O. G. C. (2007). *The Official Introduction to the ITIL Service Lifecycle.* London: The Stationery Office.

Peyvand , K., & Gupta, M. D. (2005). Public Management and the Essential Public Health Functions. *World Development, 33*(7), 1083–1099. http://dx.doi.org/10.1016/j.worlddev.2005.04.001

Polidano, C. (2000). Measuring Public Sector Capacity. *World Development, 28*(5), 805–822. http://dx.doi.org/10.1016/S0305-750X(99)00158-8

Sadek, M. T. (2009). Principais problemas do Judiciário decorrem da falta de gestão, revela estudo da AMB. *Associação dos Magistrados do Brasil.* Retrieved from http://www.amb.com.br/mod/1/index.asp?secao=mostranoticia&mat_id=19124%5D

Sambamurthy, V., & Zmud, R. W. (1999). Arrangements for Information Technology governance: A Theory of Multiple Contingencies. *MIS Quarterly, 23*(2), 261–291. http://dx.doi.org/10.2307/249754

Suomi, R., & Tähkäpää, J. (2004). Governance structures for IT in the Health Care industry. In W. Van Grembergen (Ed.), *Strategies for information technology governance* (pp. 357–381). Hershey: Idea Group Publishing.

Tavakolian, H. (1989). Linking the Information Technology Structure With Organizational Competitive Strategy: A Survey. *MIS Quarterly, 13*(3), 308–318. http://dx.doi.org/10.2307/249006

Tribiunal de Contas da União. (2010). *Levantamento de governança de TI de 2010: Tribiunal de Contas da União*. Brasil.

Van Grembergen, W., & De Haes, S. (2008). *Implementing Information Technology Governance: Models, Practices, and Cases.* New York: IGI Publishing.

Van Grembergen, W., & De Haes, S. (2009). *Enterprise Governance of Information Technology: Achieving Strategic Alignment and Value.* New York: Springer.

Weill, P., & Ross, J. W. (2004). *Governança de tecnologia da informação: Como as empresas com melhor desempenho administram os direitos decisórios de TI na busca por resultados superiores.* São Paulo: M. Books do Brasil.