

METHOD FOR MEASURING THE ALIGNMENT BETWEEN INFORMATION TECHNOLOGY STRATEGIC PLANNING AND ACTIONS OF INFORMATION TECHNOLOGY GOVERNANCE

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ABSTRACT

The purpose of this research is to present a method for measuring the degree of alignment between Strategic Planning and Information Technology Management practices and Information Technology Governance. A survey of IT governance maturity at the High Courts and the Supreme Court was carried out in order to reach this aim. The Attribute Table of the COBIT 4.1 was used both as a model for maturity analysis as for the degree of alignment of IT strategic plans of these bodies with the IT Strategic Planning established by the National Judiciary Council (CNJ). It was assessed the maturity of thirty four processes, according to six attributes, in the four COBIT domains. The proposed method, named COMPLAN-GTI, allows the linking of the guidelines of the strategic planning to the COBIT processes. The field research above mentioned shows that the alignment between the planning established by the CNJ and those established by the High Courts and Supreme Court is around 68%, leading to the conclusion that the policies and actions established by the National Council of Justice for the Judiciary are being followed. The application of the method is also used to confirm whether the management practices and the IT Governance are consistent with the strategic plan established by the organization. It was observed in the research carried out in the Courts that the average convergence between PETIs and management practices and Governance lies around 70%, leading to the conclusion that the strategic plans exerted influence on the action planning of these organizations.

Keywords: Information Technology Governance; Strategic Planning; COBIT.

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1. INTRODUCTION

The Brazilian Constitution, in its Second Article, states that the Legislative, the Executive and the Judiciary are branches of the government, independent and harmonious among themselves. Chapter III deals specifically with the Judiciary, and determines its composition, principles, the responsibilities of the several agencies that comprise it, as well as the guarantees of the Judiciary members and the Judiciary administrative and financial autonomy.

The Judiciary is constituted by the Supreme Court, the Superior Court, the Federal Regional Courts and their Federal Judges, Labor, Electoral and Military Courts and their respective Judges and the Courts and Judges of the States.

The Constitutional Amendment No. 45, dated December 30th, 2004, laid the foundations for the accomplishment of a comprehensive reform in the Brazilian Judiciary. One of the innovations introduced by the reform of the Brazilian Constitution was the creation of the National Council of Justice – CNJ (*Conselho Nacional de Justiça*), whose mission is to contribute to a decision made with morality, efficiency and effectiveness, for the benefit of justice.

The CNJ is an agency focused on the reformulation of the Judiciary's officials and the judicial procedures, especially regarding the administrative and procedural control and transparency, and it was set up in conformance with the Federal Constitution, in particular pursuant to article 103-B. It has a Standing Committee of Information Technology and Infrastructure, which proposes actions to:

- Implement adequate infrastructure for the intended operation of the Judiciary;
- Create the Information Technology Strategic Planning to ensure the appropriate technology for the proper performance of the activities of the Courts, the interoperability between different systems, and the improvement and implementation of the electronic judicial process, and
- Deploy the electronic judicial process.

In order to assist the CNJ in the Information Technology (IT) management and Governance activities, it was created a committee which has done relevant work on the Information Technology Strategic Planning for the Judiciary. This committee was approved by the Resolution No. 99 of November 24th, 2009, which established its mission, vision and attributes as well as the strategic objectives to be achieved by the Judiciary.

This research was conducted at the Superior Courts and at the Supreme Court and, although the Supreme Court it is not obliged to follow the recommendations of the CNJ, it has adopted all the practices related to the IT management and Governance.

The Supreme Court is also a member of the National Committee of Information Technology and Communications of the Judiciary.

2. THEORETICAL REFERENCE

2.1. Strategic Planning

In 2011 a research called Global Status Report on the Governance of Enterprise IT was conducted by ITGI. The research aimed to identify trends regarding the importance of the Information Technology and more than 800 IT executives from organizations located in twenty-one countries participated. The same survey was conducted in 2004, 2006 and 2008, in order to identify the growth or decline in the trends. This research showed that the vast majority of respondents see IT as an issue to the business strategies, thus confirming that IT increases the competitiveness of enterprises. (ITGI, 2011).

Strategic planning is critical to the survival of public and private organizations, since it establishes a guideline for the actions that should be followed by all units of the organization, aiming at the achievement of enterprise targets. It is a dynamic, systemic, participatory and collective process used to determine the goals, strategies and actions of the organization. The process starts with the identification of the problems within the organization. (REZENDE, 2011).

In order to meet its goals and objectives it is crucial for an organization to have its Information Technology projects and activities aligned with the demands and needs of the business. Some authors, as Henderson and Venkatraman (1993), have discussed the importance of the Information Technology for streamlining the activities of the organization, stating that this role requires the deployment of an efficient IT platform (including hardware, software and communication systems) for the management and control of all processes.

However, three scenarios are still observed in the relationship between IT and the business:

1. Focus on operational services and infrastructure of the organization;
2. Delivery of the IT solutions and support to enterprise strategies, without participation in strategy making;
3. Full integration of the IT activities with the business objectives and strategic goals of the company.

Scenario 3, which is considered the most suitable one for the delivery of the desired business value, can be achieved with the adoption of an IT strategic planning (PETI – Plano Estratégico de TI), which should be aligned and integrated with the institutional strategic planning. PETI is a dynamic and iterative process that defines, in a strategic level, the organizational information, the IT resources (hardware, software, data and information management, and information systems), the people involved in the process and the infrastructure necessary to meet all the goals and objectives established by the organization. (REZENDE, 2011).

2.2. Information Technology Governance

The Governance of Information Technology is part of the Corporate Governance and it consists of the leadership, the organizational structures and the processes that ensure the IT organization to sustain and extend the organization's strategies and goals, based on the guidelines of the strategic planning.

It is necessary to discuss the Corporate Governance, since all definitions of the Information Technology Governance are directly or indirectly related to it.

The Code of Best Practices for Corporate Governance, published by the Instituto Brasileiro de Governança Corporativa, (*Brazilian Institute of Corporate Governance*) states that Corporate Governance is the system by which organizations are directed, monitored and encouraged, involving the relationships among the owners, the board of directors, the management and the control bodies. Good Corporate Governance practices translate principles into objective recommendations, aligning interests in order to enhance and preserve the value of the organization, facilitating its access to the resources and contributing to its longevity. (IBGC, 2009).

This is not a new subject, but it deserved special mention in the press after the financial scandals at the beginning of this century, when important U.S. companies such as Enron, WorldCom and Tyco led thousands of customers into bankruptcy due to accounting manipulations and financial disruptions.

Weill and Ross (2006) proposed a framework to link corporate governance to IT governance. There are two groups in this framework. The first group describes the relationships of the board with the shareholders and other stakeholders. The senior executive team acting as an agent of the board is responsible for articulating strategies and behaviors to carry out the directions of the board. The other group encompasses the seven main assets (human, financial, physical, intellectual property, relationship, information, and IT), and, through them, the companies accomplish their strategies and generate business value. According to these authors, companies with common mechanisms for various assets present a better performance.

IT governance involves many aspects related to the practices established and consolidated in the market. IT governance development strategies should take into account aspects related to the available resources, the structure and the business of each organization. The proper goal setting and decision making should result in benefits for the organization.

In order to be considered effective, and according to Weill and Ross (2006), IT governance must answer three questions:

1. Which IT decisions must be made to ensure the effective management and use of IT?
2. Who should make such decisions?
3. How will these decisions be made and monitored?

To answer the first two questions, the authors proposed an array of governance arrangements, that relates five IT key decisions (IT principles, IT architecture, IT infrastructure, needs for business applications and IT investment and prioritization) to

seven organizational archetypes (business monarchy, IT monarchy, feudalism, federalism, duopoly, and anarchy). The IT key decisions concern to the major decisions to be taken in the domain of the IT governance, while the archetypes typify the decision makers.

The IT principles clarify the business role of IT; the architecture defines the requirements for integration and standardization; the infrastructure determines the shared services and the support services; the need for business applications specify the business needs for IT applications, which were acquired or developed internally, and the investments and prioritization of IT indicate which initiatives to fund and how much to spend on them.

Regarding the archetypes, the responsibilities of those who make the decisions are passed on to the senior management in business monarchy to IT managers in IT monarchy, to the managers of the business units in feudalism, to the headquarters and branches managers in federalism. In the case of IT duopoly, IT managers and some other group are the decision makers and, finally, in anarchy, the decisions are made individually or in small groups.

The ITGI (2007) defines the following focus areas in the IT Governance:

1. Strategic Alignment: align the IT operations with the organization's strategic objectives. It is responsible for ensuring alignment and prioritization of projects based on the strategic goals of the organization;
2. Value Delivery: ensures that IT delivers to the business the benefits foreseen in the IT strategy. It is responsible for the cost optimization and the provision of the IT intrinsic value;
3. Resource Management: focuses on the better use of investments and on the appropriate management of the critical IT resources: applications, information, infrastructure and people;
4. Risk Management: emphasizes a clear understanding of the organization's appetite for risk as well as the compliance requirements, the transparency about the significant risks to the organization and the inclusion of risk management into the routine activities;
5. Performance Measurement: tracks and follows up the implementation of the strategies, the progress of projects, the use of the resources, the delivery and the support services performance.

In the public sector some difficulties arise when it adopts the frameworks developed specifically for private companies. Therefore, Weill and Ross (2006) proposed a specific framework for nonprofits organizations, being categorized as government organizations which include defense, immigration, public services, police, education and health, as well as NGOs.

According to the authors, four major challenges of nonprofit organizations were identified: measurement of value and performance, investments in IT infrastructure, coproduction and architectures, and citizens, clients and buyers.

The measurement of value is difficult to implement because some factors like profit or cost reduction are not involved. Thus, the measurement of value should be

made taking into account other parameters such as the customer satisfaction, the quality of the product delivered and the quality of the support to the customer in the public sector, the customer is the citizen).

According to the authors, the investments in infrastructure can be justified in three ways: by holding office, i.e., without the need to submit justification; by expense reduction, that can be quantified and assessed; and by the enablement of new capabilities.

Co-production refers to the capacity of nonprofit organizations to encourage or compel the co-producers to commit to creating public value to a wider audience. Such capacity can bring direct benefits to the citizens as much as it allows reducing deadlines and anticipating the delivery of services to the society.

Citizens, customers and buyers should be identified in the provision of services by nonprofit organizations, since the treatment devoted to each one of them may be different due to the goals to be achieved.

The identification of these four major challenges, in association with others, influences how the organization implements its IT governance, thus justifying the importance of this identification.

Research developed by Xavier (2010) in the Federal Public Administration agencies concluded that the COBIT ® (Control Objectives for Information and related Technology) may serve as reference for the implementation of improvements aiming at the establishment of IT goals and indicators. Also, it allows monitoring the evolution of the IT governance maturity level in the agencies of the Brazilian Public Sector.

2.2.1 The COBIT Framework

The COBIT framework was developed by ITGI and the current version is number 5. This version was published in mid-April 2012 and it is a significant update to COBIT. However, the previous version, the 4.1, used in this study, still has wide acceptance due to its large knowledge base application.

COBIT 4.1 provides best practices for IT Governance using a model which consists of domains, processes and activities presented in a manageable and logical structure (ITGI, 2007). It provides a framework to manage and control IT activities and presents five key characteristics: focus on business, process orientation, overall acceptability, compliance requirements and common language.

The COBIT framework is based on the premise that IT has to deliver the information required by the business to help it achieve its goals. It provides a framework and a guide to implement IT governance, allowing the prioritization of IT processes that should be improved. The model combines the business requirements for information with the objectives of the IT function.

Thus, the basic principle of the COBIT framework can be summarized as IT resources which are managed by IT processes to achieve IT goals which, in turn, respond to business requirements (ITGI, 2007). This principle is illustrated in Figure 1, in the COBIT cube. In each dimension of the cube, in this figure, are shown the IT processes (thirty-four, divided into four domains), the IT resources (applications, information, infrastructure and people) and the business requirements (effectiveness,

efficiency, confidentiality, integrity, availability, compliance and reliability of information).

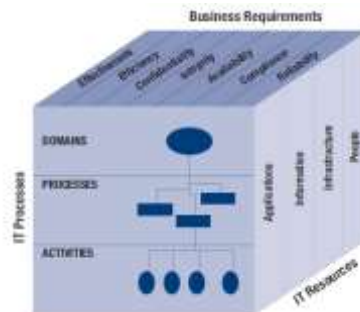


Figure 1 – The COBIT Cube
Source: (ITGI, 2007, p. 27)

IT processes are organized into four areas and divided into two hundred and ten activities. Each domain has its own set of control objectives and scope. They are the following: Plan and Organize (PO), Acquire and Implement (AI), Deliver and Support (DS) and Monitor and Evaluate (ME).

The maturity analysis of each COBIT process allows the organization to identify its current stage, the current state of the market (benchmarking), the maturity desired and the path to be traversed to go from the current situation to the future one. Each COBIT process is rated on a generic and complex scale, requiring a complete and systemic view of the organization (XAVIER, 2010). The scale used is shown in Table 1 that describes the general characteristics of the degrees of maturity.

0 - Non-Existent	Complete lack of a recognized process. The organization does not even acknowledge that there is an issue to be worked on.
1 - Initial / Ad hoc	There is evidence that the organization has recognized that there are issues which need to be addressed. However, there is no standardized process, but rather, an ad hoc approach which tends to be applied individually or on a case-by-case basis. The general approach to management is disorganized.
2 - Repeatable but Intuitive	Processes have evolved to a stage where similar procedures are followed by different people doing the same task. There is no formal training or communication of standard procedures, and the responsibility is left to the individuals. There is a high degree of confidence in the individuals' knowledge , and, consequently, errors may occur.

3 - Defined	Procedures were standardized, documented and communicated through training. It is mandatory that these processes are followed up. However, there is a possibility that deviations will not be detected. The procedures are not sophisticated, but there is a formalization of existing practices.
4 - Managed and Measurable	The management monitors and measures adherence to the procedures and takes action when the processes are not working well. The processes are constantly improved and, thus, they provide good practices. The use of automation and tools is limited or fragmented.
5 - Optimized	The processes have been refined to a level of good practice and are continually improved. IT is used as an option to automate the workflow, providing tools to improve quality and effectiveness, thus helping the organization to adapt quickly.

Source: (ITGI, 2007, p.21). Adapted by the authors.

The proposed measure of maturity, presented here, is supported by the study entitled IT Governance and Process Maturity of ITGI. This proposal is linked to COBIT, and it shows a simpler maturity evaluation process, compared to the maturity assessment mechanisms commonly employed (ITGI, 2008). The IT Governance and Process Maturity publication shows the details of a study involving fifty-one institutions in North America, Asia and Europe, which are organized, among other criteria, by area. These areas of expertise include capital-intensive industries (high cost of capital assets), utilities (infrastructure for public services), service industries, financial institutions, and finally, government and non-profit organizations.

The use of attributes attached to processes allowed the design of a methodology to assess the maturity in a simpler and more straightforward way. The original approach of the COBIT presents a specific model that provides a maturity scale for each of the thirty-four processes. Thus, each process has its own maturity model, which has been generated from a generic model.

This generic model provides for the identification of referential attributes (Awareness and Communication; Policies, Plans and Procedures; Tools and Automation; Skills and Expertise; Responsibility and Accountability and Goal Setting and Measurement). Such attributes are organized in a 0 to 5 scale (0 = non-existent, 1 = initial or ad hoc, 2 = repeatable but intuitive, 3 = defined, 4 = managed and measured and 5 = optimized) that allows its application to any process, i.e., there is no need, when evaluating the maturity of a given process, to use a specific maturity model linked to it, but to use only the Attributes Maturity Table (Table 2), where the generic model is presented.

Recognition of the need for the process is emerging There is sporadic communication s about the issues	There are <i>ad hoc</i> approaches to processes and practices The process and policies are undefined	Some tools may exist; usage is based on standard desktop tools There is no planned approach to the tool usage	Skills required for the process are not identified. A training plan does not exist and no formal training occurs	There is no definition of accountability and responsibility. People take ownership of issues based on their own initiative on a	Goals are not clear and no measurement takes place
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Source: (XAVIER, 2010)

Each maturity level, in this generic model, presents what is expected for each attribute. Indeed, there is a range of maturity levels for each one of the six attributes. According to this scale, it becomes easy to identify the level of maturity of each process simply locating the situation that best fits the current situation of the process in the Attributes Maturity Table.

3. METHOD TO COMPARE STRATEGIC PLANS AND IT GOVERNANCE ACTIONS - COMPLAN – GTI

The COMPLAN - GTI method was created to check the alignment between the strategic plans of the Courts and the plan established by the National Judicial Council for the Judiciary, as well as the alignment of IT governance and management practices with the related strategic planning.

This method proposes an objective analysis of the strategic planning of an organization by comparing and listing of all objectives, actions and goals of the strategic planning to the COBIT processes. It also evaluates whether management and IT governance practices are performed by the organizations in accordance with its strategic planning.

The step of the method dedicated to comparing the actions and goals of the strategic planning to the COBIT processes is justified by the fact that the Courts which have been evaluated had recently done a COBIT maturity evaluation that pointed out their strengths and weaknesses. The outcome of this evaluation casta doubt on whether the Courts were planning objective actions to overcome their shortcomings. Therefore, this is the purpose of this step of the COMPLAN-GTI method, i.e., to assess whether the planned strategic actions have support in the reality exposed by the COBIT maturity assessment.

A strategic plan aims to establish a guideline for the actions that should be followed by all units of the organization in order to reach its targets. The National

Council of Justice established, pursuant to Resolution No. 99 of November 24th 2009, the IT Strategic Planning for the Judiciary (BRAZIL, 2009), but it did not indicate, among the established objectives, which ones had the highest priority. Consequently, all actions must be undertaken with the same degree of importance.

The application of this method requires a previous analysis of the IT Strategic Planning of the organization in order to identify the themes (or perspectives) and the strategic objectives related to the lines of action to be carried out. The method seeks to relate every proposed action to accomplish a strategic planning goal to the COBIT processes. To achieve this, the following actions must be taken:

1. Identify the keywords of the proposed action;
2. Search the occurrence of the keywords in the whole set of processes (thirty-four) and in the detailed control objectives (two-hundred and ten) of the COBIT. If there is a match, it has to be assessed whether the process or the detailed control objective relates to the proposed action. This assessment, although subjective, should be performed by an appraiser with the following competencies, skills and characteristics:
 - 2.1. Professional experience: he/she should be a technical professional or a participant of the managerial staff of the Court; this person should have practical experience in the area of the evaluated process and he/she should know about the IT management processes practiced in the Court;
 - 2.2. Knowledge of the COBIT 4.1 framework, processes and detailed control objectives;
 - 2.3. Ability to relate the actions taken by the Court to the indicated COBIT processes;
 - 2.4. Ability to work in a team, if the assessment is carried out by more than one professional.
3. The identified process should comprise the column Related COBIT Process – Priority COBIT Process;
4. In case there is no match between one of the keywords and the processes and the detailed control objectives of COBIT, synonyms should be used in the conducted search in order to exhaust all the possibilities of relationship with those COBIT components.

Steps 1 to 4 must be repeated for all actions related to the strategic planning in order to identify all the COBIT processes related to the specific actions of the IT Strategic Plan (PETI).

This method was also applied to the IT strategic planning of each one of the Courts under study, therefore allowing the identification of the COBIT processes related to each theme or strategic objective listed in the IT strategic planning of the organization.

After the identification of the COBIT processes related to the actions set out in the IT strategic planning of both CNJ and the Court, it is possible to create a map to indicate the presence of these processes in the two plans.

This study identified four scenarios in the relationship between the strategic planning of the CNJ and the nth Court being analysed (TRIBUNALn):

- i) COBIT process present in PETI - CNJ and present in PETI - TRIBUNALn (Scenario 1),
- ii) COBIT process present in PETI - CNJ and absent in PETI - TRIBUNALn (Scenario 2),
- iii) COBIT process present in PETI - TRIBUNALn and absent in PETI - CNJ (Scenario 3) and
- iv) COBIT process absent in both strategic planning (Scenario 4).

The percentage of alignment is obtained by relating the quantity of processes belonging to scenarios 1 and 2. These are the scenarios where the COBIT process is present in the IT strategic planning established by the CNJ for the Judiciary. Then, it was decided that if the percentage of alignment exceeds 50%, the plans should be considered aligned. In order to obtain this percentage, the following formula was used:

$$\%alignment = \frac{Scenario\ 1}{(Scenario\ 1 + Scenario\ 2)} * 100$$

The application of the research questionnaire is also part of the method. The questionnaire identifies the maturity of each one of the COBIT processes in the Court which are analyzed according to six attributes (Awareness and Communication; Policies, Plans and Procedures; Tools and Automation; Skills and Expertise; Responsibility and Accountability and Goal Setting and Measurement).

The Process Maturity (MatProc) is the integer value obtained by truncation of the arithmetic mean of the values of each of the attributes related to that process. XAVIER (2010, p. 59). Thus,

$$MatProc = \frac{\sum_{n=1}^6 Atributtes}{6}$$

Every process was evaluated according to its current status at the time and what is expected two years from now (future status). All thirty-four COBIT processes were evaluated.

To check the alignment between the strategic planning of the Court and its IT governance and management practices, a table was created. It shows the current and future maturities of all COBIT processes and the improvement of the maturity necessary for the achievement of the future situation. To calculate this increase in maturity, the current maturity is subtracted from the future maturity. The application of this criterion aims to identify which processes will be subject to greater attention by the Court in the actions to be undertaken in the next two years. Such efforts are related to the status of the COBIT processes.

The actions to be taken concerning the processes of scenarios 1 and 2 are those related to the strategic planning of the CNJ. Thus, these efforts should be prioritized as

they aim to enforce the provisions of the CNJ. Processes related to scenarios 3 and 4 are not part of the PETI-CNJ because the processes of scenario 3 are listed only in the PETI of the Court and the processes of scenario 4 are not present in any of the strategic plans. Thus, the percentage of alignment of IT governance and management practices with strategic planning is obtained by applying the formula:

$$\%Alignment\ COBIT \times PETI = \frac{Esf\ Sit\ 1 + Esf\ Sit\ 2}{Esf\ Sit\ 1 + Esf\ Sit\ 2 + Esf\ Sit\ 3 + Esf\ Sit\ 4}$$

where: *EsfSit n = Increase of Maturity for Scenario n*

If the alignment percentage exceeds 50%, it was decided that the IT governance and management practices should be considered aligned with the strategic planning of the Court, since more than half of the efforts are directed to the guidelines set out in the IT strategic planning.

4. APPLICATION OF THE COMPLAN-GTI METHOD

The method was applied to the IT strategic planning of the Brazilian Superior Courts and the Supreme Court as well as to the PETI established by the CNJ for the Judiciary. It was also used to evaluate the IT governance and management practices of the Courts through the assessment of the priorities given to the COBIT processes. To protect the information provided by the Courts, they were identified only as TRIBUNALn, where n ranges from 1 to 5, since five Courts were surveyed.

The following values were set by the CNJ on the IT Strategic Planning for the Judiciary: speed, modernity, accessibility, transparency, social and environmental responsibility, fairness, ethics and probity. Thirteen strategic objectives were grouped into eight themes, which are presented in Table 3, with the lines of action established by the CNJ for its implementation. For each of the actions listed in PETI-CNJ the COMPLAN-GTI method was applied in order to identify the COBIT related processes.

The analysis of the PETI-CNJ identified major strategic objectives and actions to be undertaken for the achievement of themes. The themes identified by CNJ were: efficiency, access to the main Judicial information system; social responsibility; alignment and integration, institutional performance, people management, infrastructure and technology budget. Each theme had one or more related strategic objectives, with their respective actions.

For every action, keywords with their synonyms were identified and they were called search expressions. These expressions have been searched in the process table and in the detailed control objectives of the COBIT. On the selected processes, a subjective analysis was performed by the assessor to evaluate whether the process or the detailed control objective was actually related to the proposed action.

The method COMPLAN-GTI was applied to the IT strategic planning of the Courts. According to studies performed in the strategic planning of the Court, the main

themes/perspectives, the strategic objectives and the lines of action to be undertaken by the Court were identified.

After collecting the actions and the lines of action, a method to identify the COBIT processes related to each action was applied, as shown in Table 3.

The planning established by CNJ (BRAZIL, 2009) stated in its 2nd Article that: "The National Council of Justice and the Courts indicated in sections 11 to 92 of Article VII of the Constitution will establish their respective information technology and communications (ITC) strategic plans aligned with the National ICT Strategic Plan, with a minimum coverage of five years and it shall be approved in its plenary and special organs until March 31, 2009."

Thus, all the goals and targets set in the strategic planning of the Court under analysis must be aligned to the goals and targets set by the National Council of Justice.

5. ANALYSIS OF THE RESULTS

The results were organized according to three criteria, as follows: qualitative data analysis of the Courts; alignment between the IT strategic planning of the Courts and that same alignment concerning the National Judicial Council for the Judiciary and, finally, the analysis of the IT actions undertaken by the Courts in light of their IT strategic planning.

5.1 Alignment between PETI-CNJ and PETI-TRIBUNAL

To check the alignment between the strategic planning of the Courts and the one established by the CNJ for the Judiciary, a table was created. In this table, called Table 3, all the COBIT processes were listed and their presence or absence in the strategic planning of CNJ and the Courts was marked. The COBIT processes were selected using the COMPLAN-GTI method as described in Chapters 3 and 4.

The columns "CNJ" and "TRIBUNAL N" show the "yes" status if the related process is present in their strategic planning according to the four scenarios that may occur in the relationship between the strategic planning of the CNJ and the COURT.

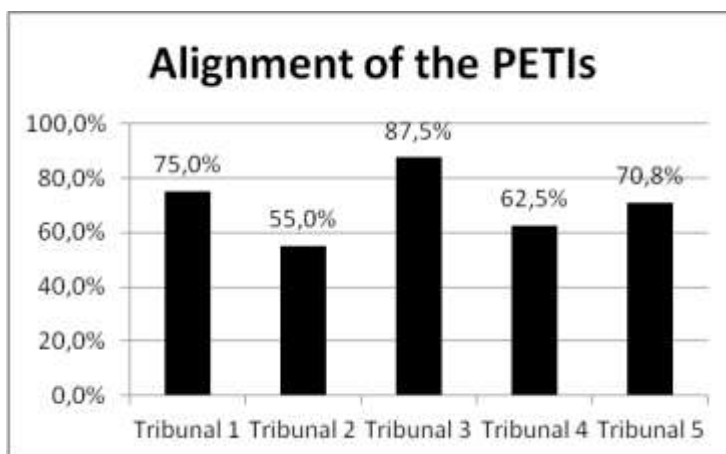
Table 3 – Alignment of the PETI of the Courts with the PETI-CNJ

PROCES SO	CNJ	TRIB.1	Scce. Trib 1	TRIB.2	Scce. Trib 2	TRIB.3	Scce. Trib 3	TRIB.4	Scce. Trib 4	TRIB.5	Scce. Trib 5
PO01	yes	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1
PO02	yes		Scenario 2		Scenario 2	yes	Scenario 1		Scenario 2		Scenario 2
PO03	yes	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1
PO04	yes	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1
PO05	yes	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1
PO06	yes		Scenario 2	yes	Scenario 1	yes	Scenario 1		Scenario 2	yes	Scenario 1
PO07	yes	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1		Scenario 2	yes	Scenario 1
PO08	yes	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1
PO09	yes	yes	Scenario 1	yes	Scenario 1		Scenario 2	yes	Scenario 1		Scenario 2
PO10	yes	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1
AI01			Scenario 4		Scenario 4	yes	Scenario 3		Scenario 4	yes	Scenario 3
AI02	yes		Scenario 2		Scenario 2	yes	Scenario 1		Scenario 2		Scenario 2
AI03	yes	yes	Scenario 1		Scenario 2	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1
AI04	yes	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1
AI05	yes		Scenario 2		Scenario 2	yes	Scenario 1		Scenario 2		Scenario 2
AI06		yes	Scenario 3		Scenario 4	yes	Scenario 3	yes	Scenario 3		Scenario 4
AI07	yes	yes	Scenario 1		Scenario 2	yes	Scenario 1	yes	Scenario 1		Scenario 2
DS01	yes	yes	Scenario 1		Scenario 2	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1
DS02			Scenario 4		Scenario 4	yes	Scenario 3		Scenario 4		Scenario 4
DS03	yes		Scenario 2		Scenario 2	yes	Scenario 1	yes	Scenario 1		Scenario 2
DS04	yes	yes	Scenario 1	0	Scenario 2	yes	Scenario 1		Scenario 2	yes	Scenario 1
DS05	yes	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1		Scenario 2	yes	Scenario 1
DS06		yes	Scenario 3	yes	Scenario 3		Scenario 4	yes	Scenario 3	yes	Scenario 3
DS07	yes	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1		Scenario 2	yes	Scenario 1

PROCESO	CNJ	TRIB.1	Scen. Trib 1	TRIB.2	Scen. Trib 2	TRIB.3	Scen. Trib 3	TRIB.4	Scen. Trib 4	TRIB.5	Scen. Trib 5
DS08	yes	yes	Scenario 1		Scenario 2		Scenario 2	yes	Scenario 1	yes	Scenario 1
DS09		yes	Scenario 3		Scenario 4	yes	Scenario 3		Scenario 4		Scenario 4
DS10		yes	Scenario 3		Scenario 4		Scenario 4	yes	Scenario 3		Scenario 4
DS11			Scenario 4		Scenario 4		Scenario 4		Scenario 4		Scenario 4
DS12			Scenario 4		Scenario 4		Scenario 4		Scenario 4		Scenario 4
DS13		yes	Scenario 3		Scenario 4	yes	Scenario 3		Scenario 4		Scenario 4
ME01	yes	yes	Scenario 1		Scenario 2	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1
ME02		yes	Scenario 3	yes	Scenario 3		Scenario 4	yes	Scenario 3	yes	Scenario 3
ME03	yes		Scenario 2		Scenario 2		Scenario 2		Scenario 2		Scenario 2
ME04	yes	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1	yes	Scenario 1

Graph 1 portrays the result of the analysis of the alignment between the PETI-CNJ and the IT strategic planning of the Courts (formula % alignment).

Graph 1 – Alignment between PETI-CNJ and PETI of the Courts



Graph 1 points out that all Courts had alignment percentages exceeding 50%, what indicates, as defined, that the strategic plans of these Courts are aligned with the strategic plans of the CNJ. These results answer “yes” to the first research question which is: Are the guidelines and recommendations of the National Council of Justice being met? In order to answer this question, it is necessary to have in mind that those

guidelines and recommendations aim to meet the guidelines of the controlling agencies, and, also, they especially aim to make the agencies of the Judiciary act with greater effectiveness and efficiency.

This result was expected because Resolution No. 99, in its 2nd Article, imposed that the Courts specified in sections 11 to 92 of Article VII of the Constitution (including the High Courts) would have "to develop their information technology and communications strategic planning **aligned with the National ICT Strategic Plan**, with a minimum coverage of five years [...]" (BRAZIL, 2009, authors' emphasis) .

On average, the High Courts and the Supreme Court had a percentage of 70.16% of alignment of their IT strategic planning with the planning established by the CNJ for the Judiciary. Nevertheless, this alignment is not complete due to the diversity of priorities set by the management of the Courts, and such management lasts only two years. Thus, all Courts undertake information technology actions not only to achieve the goals set by the CNJ but, also, to meet the guidelines of their respective administrations.

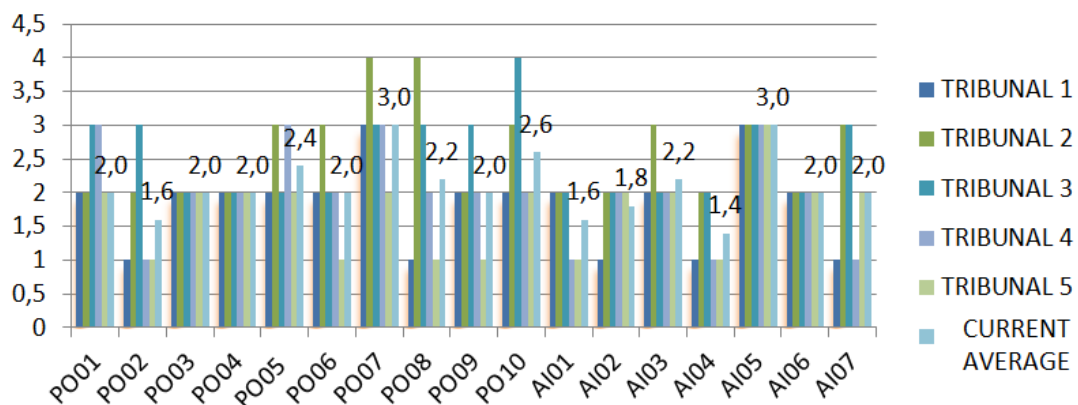
5.2 Application of the survey questionnaire of IT governance

The survey questionnaire was applied to the five Courts in order to assess the maturity of the IT governance using the COBIT attribute table, as explained in the description of the data collection phase.

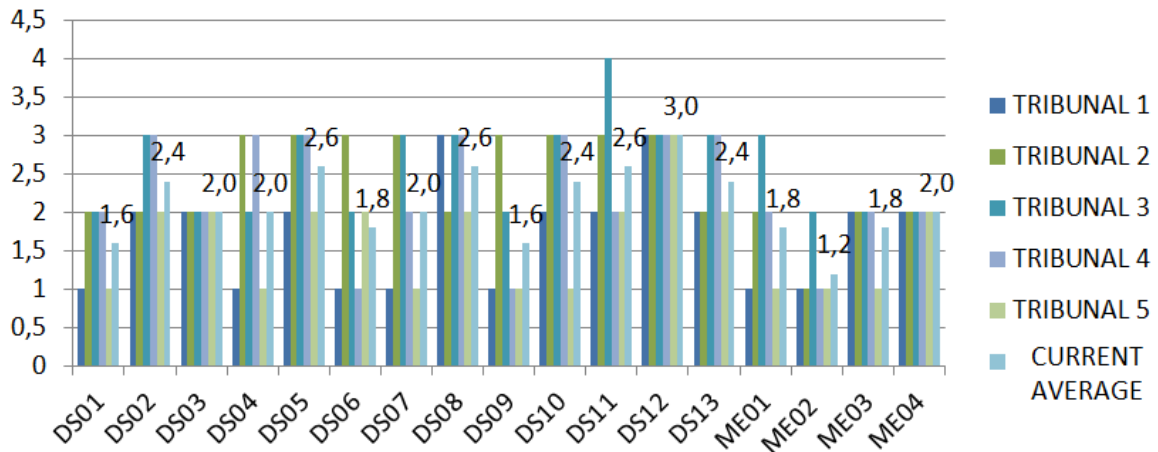
Each process was evaluated according to the six attributes of the COBIT (Awareness and Communication; Policies, Plans and Procedures; Tools and Automation; Skills and Expertise; Responsibility and Accountability, and Goal Setting and Measurement) on current and future perspectives. The maturity of the process was calculated with basis on the values obtained.

This research also aims to provide some information to the Courts in order to enable them to work out benchmarking. Graphs 2 and 3 show the maturities of all Courts, as well as the global average maturity. Thus, this data can be used by managers and administrators to conduct analysis to identify the position of one Court compared to the position of other Courts, and to search for creative solutions to solve common problems. The average maturity, per process, is also shown in the graphs in order to facilitate their identification.

Graph 2 – Current Average Maturity. Processes PO1 to AI7



Graph 3 – Current Average Maturity. Processes DS1 to ME4



The global average maturities, the average maturity of each of the High Courts and the average maturity of the Supreme Court were calculated in the current and future scenario. The maturity level values were calculated to one decimal place to allow a better understanding of the differences found between the Courts, although for the COBIT 4.1, these values should be presented in integer format without decimal places.

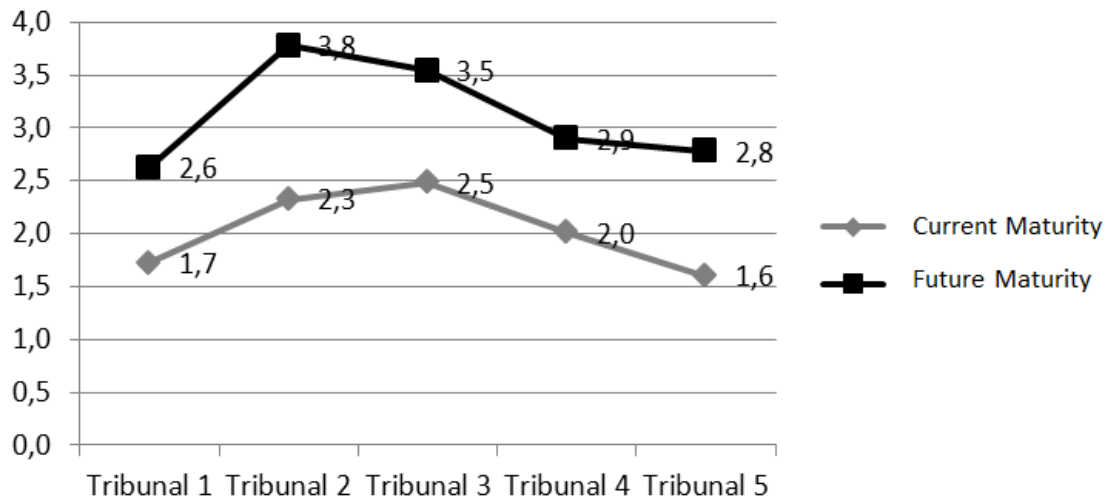
The maturities shown are the integer values obtained for each process, according to the set of attributes of the COBIT. The arithmetic mean was calculated for each process.

The following formula was used to calculate the average maturity, the current and future average maturity of each Court.

$$Maturity = \frac{\sum_{n=1}^{34} Maturity\ n}{34}$$

Graph 4 was plotted with the values obtained above.

Graph 4 – Current and Future Maturities of the Courts



The average maturity of the Courts was obtained applying the formula:

$$\text{Average Maturity} = \frac{\sum_{n=1}^5 \text{Maturity Court } n}{5}$$

The current and future average maturity of the High Courts and the Supreme Court was:

$$\begin{aligned} \text{Current average maturity} &= 2.0 \\ \text{Future average maturity} &= 3.1 \end{aligned}$$

The current maturity value, 2.0, shows that the management and the IT governance processes of the Superior Courts, although repeatable, are not documented and are just intuitive. Processes have evolved to a stage where similar procedures are followed and executed by different people. However, there are no formal training standard procedures and the official communication is not yet institutionalized. There is a tendency to focus the responsibilities on the individual, with the corresponding increase risk of errors.

The fact that the courts wish to reach a level of maturity in the next two or three years shows that the upper administration of the Courts is confident in sponsoring the IT projects. To reach this level of maturity, it is necessary that the IT governance practices are effectively sponsored by the high authorities of the Courts who should prioritize the creation of IT governance Committees, and, also, they should prioritize the actions related to the strategic alignment of IT with business and the delivery of value. It is expected that in two years from now the procedures be standardized, documented and

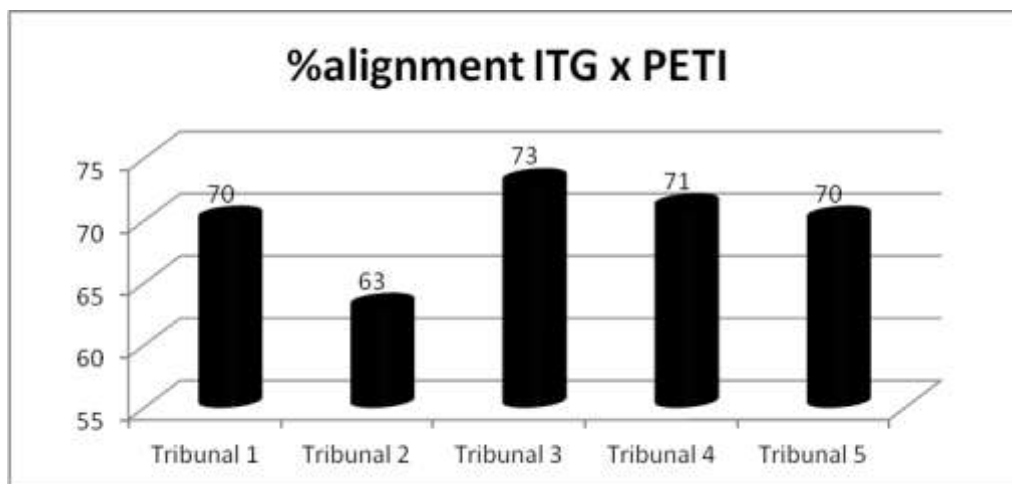
formally communicated as well as the monitoring of the adherence to the standard procedures be in effect.

5.3 Alignment between PETI-TRIBUNAL and IT governance

The application of the method to survey the alignment among the IT governance (ITG), the management practices and the strategic planning have identified which processes should be object of greater attention by the Court in the actions to be undertaken in the next two years. Such efforts are related to the situation of the COBIT process.

Graph 5 shows the percentage of effort dedicated to the actions related to scenarios 1 and 2, above 50%.

Graph 5 - % Alignment ITG and PETI-TRIBUNAIS



The average value found is 70%, what justifies the statement that the IT governance and the management practices of the Courts are in line with their strategic planning. These results answer the second research question: *Are the actions prioritized by the Courts aligned with their strategic planning?*

It is important to remark that effort calculations were performed in absolute terms, with each unity of maturity increase (future status - current status) corresponding to one unity of effort, regardless of the complexity of the process evaluated. Some COBIT processes require greater efforts than others in order to increase one unit into the maturity level. The framework COBIT 4.1 provides an annex, named Linking IT Processes to IT Goals, where the thirty-four COBIT processes are related to twenty-eight IT Goals. It is possible to confirm that some processes influence a larger number of goals (ITGI, 2007). For example, when analyzing IT Goals achieved by the process ME4 - Provide IT governance (five goals), it seems that these goals are more complex than the process AII - Identify Automated Solutions (only two goals). However, for the purposes of this research, these efforts were equally carried out.

6. CONCLUSION

The aim of this work is to propose a method to assess whether the guidelines of an information technology strategic planning (PETI) are observed on the IT governance and management practices, and to verify the alignment between IT strategic plans. In order to evaluate the applicability of the method the IT strategic planning of the Superior Courts and the Supreme Court were analyzed, and also the PETI established by the National Judicial Council for the Judiciary. As a model for maturity analysis, it was undertaken a survey of IT governance maturity of the Superior Courts and the Supreme Court using the Attribute Table of COBIT, which is composed of six attributes: Awareness and Communication; Policies, Plans and Procedures; Tools and Automation, Skills and Expertise, Responsibility and Accountability and Goal Setting and Measurement.

This research was carried out due to the low incidence of academic studies (thesis, articles and books) that deal with both IT Governance and Strategic Planning in public organizations, as well as the repeated interventions of internal and external control agencies. The research in the Court of Audit, specially, pointed out the weaknesses on IT Governance in the agencies and entities of the Brazilian Federal Public Administration. The huge financial resources that have been invested by the public sector in activities related to information technology were also considered. In the last ten years, for example, 12.5 billion dollars have been spent on IT resources, according to the Court of Audit.

The proposed method, called COMPLAN-GTI, allows linking the guidelines of an IT strategic planning to COBIT processes. In this study, the version 4.1 of the COBIT framework was used.

Initially, it was carried out an evaluation of the relation of the IT strategic planning established by the National Judicial Council for the Judiciary concerning the COBIT processes. The same analysis was done with the PETI of the High Courts and the Supreme Court, making it possible to determine the degree of alignment between the various strategic plans. The Courts are, on average, 68% aligned with the guidelines and actions established by the National Council of Justice for the Judiciary.

The application of the method permitted to check if the IT governance and management practices are consistent with the strategic plan of the organization. It was observed on the survey carried out in the Courts that the average convergence between PETI and IT governance and management practices lies at 70%, therefore concluding that the strategic plans have influenced the action plans in these organizations.

The results obtained will allow the Federal Public Administration agencies, in particular the Brazilian Supreme Courts, to conduct benchmarking aiming to identify the strengths and weaknesses and, with the support of those who implemented best practices in the Courts, to contribute to the improvement of the Brazilian public sector. It is also possible to perform an analysis to identify the position of the Court in relation to other Courts, in order to enable the search for creative solutions to solve common problems.

It is worth mentioning that the proposed method can, in principle, be applied to public or private organizations, as a general tool for the analysis of IT governance management practices.

As for the limitations of this research, it can be mentioned that the method requires minimum skills for the assessor, such as knowledge of the maturity measurement model based on attributes of the COBIT 4.1, knowledge of the actions of IT governance and management practiced on the agency, and ability to relate the actions taken by the Court and the related COBIT processes. In addition, as the survey did not have the characteristics of an audit, there was no evidence of responses, what requires caution on the analysis of the results. Finally, it is important to point out that this research has not undergone a validation process, given the difficulty of reproducing the conditions necessary for its implementation, such as the existence of an overall strategic plan of the sector, a strategic plan for each agency evaluated and a recent IT Governance maturity evaluation for each one of them. Nowadays, this situation is found only in the Judiciary, particularly in the CNJ and the High Courts, being unique on the Federal Public Administration.

It is suggested, as a future work, to undertake a focus group meeting with managers of the Federal Public Administration for model validation. In this focus group meeting the principles, guidelines and procedures of the COMPLAN - GTI method will be presented and the perceptions of the managers about the proposed model will be collected through semi-structured interviews. The contributions of these experts will be included in a new version of the COMPLAN-GTI method. Moreover, the proposed model can be enhanced to implement its guidelines on the new COBIT 5 framework, published by ISACA in April 2012. The evolution of the current model 4.1 to the version 5 model will bring benefits due to the separation of the governance practices from the management practices, simplifying the application of the method. Overall, this work may serve as a reference for other research studies related to the same general themes: IT governance, strategic planning, and IT management in public organizations

REFERENCES

Brasil. Conselho Nacional de Justiça. Resolução nº 99, de 24 de novembro de 2009. Planejamento Estratégico de TI do Poder Judiciário. http://www.cnj.jus.br/images/gestao-planejamento-poder-judiciario/petic_nacional.pdf

Henderson, John; Venkatraman, N. Strategic alignment: Leveraging information technology for transforming organizations. IBM Systems Journal, Vol. 32, No. 1, 1993.

IBGC. Código das melhores práticas de governança corporativa. 4ª Edição. São Paulo: IBGC, 2009.

ITGI (Information Technology Governance Institute). Cobit 4.1. USA: 2007. <<http://www.isaca.org/Knowledge-Center/cobit/Documents/cobit41-portuguese.pdf>>.

_____. Global Status Report on the Governance of Enterprise IT. USA, 2011. <<http://www.isaca.org/Knowledge-Center>>.

_____. IT Governance and Process Maturity. USA, 2008.

Rezende, Denis Alcides. Planejamento de Sistemas de Informação e Informática. Guia Prático para Planejar a Tecnologia da Informação Integrada ao Planejamento Estratégico das Organizações. 4º Edição. São Paulo: Editora Atlas, 2011.

Weill, Peter e ROSS, Jeanne. W. Governança de Tecnologia da Informação. São Paulo: M. Books do Brasil Editora Ltda., 2006.

Xavier, M. B. G. Mensuração da Governança de TI na Administração Direta Federal Brasileira. 2010. 123p. Dissertação de Mestrado. Universidade Católica de Brasília, Brasília, 2010.
http://www.bdttd.ucb.br/tede/tde_busca/arquivo.php?codArquivo=1333&PHPSESSID=21faebff671d65448560a0b967731d20