IT GOVERNANCE IN A RESEARCH INSTITUTE WITHIN THE BRAZILIAN FEDERAL GOVERNMENT

Paulo Henrique Bianchi¹, Francisco Carlos Paletta²

¹ Instituto de Pesquisas Energéticas e Nucleares (IPEN / CNEN - SP) Av. Professor Lineu Prestes 2242 05508-000 São Paulo, SP phbianchi@ipen.br

² Instituto de Pesquisas Energéticas e Nucleares (IPEN / CNEN - SP) Av. Professor Lineu Prestes 2242 05508-000 São Paulo, SP fpaletta@ipen.br

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ABSTRACT

The organization of IT (Information Technology) areas within the Federal Government, through a governance structure adherent to mature practices widely recognized and used by successful companies, has been gaining strength and shape in recent years. Eager to link the goals of its IT Planning with the Corporative Planning objectives, intending to add the greatest possible value to the corporation when the role of IT is to support the central activities, the structuring of an IT Governance has already become part of the standards of the government Executive branch, such as its Normative Instruction No. 04, from November 12, 2010. In this context, the CNEN (*Comissão Nacional de Energia Nuclear* - National Commission for Nuclear Energy) has made its PDTI (*Plano Diretor de Tecnologia da Informação* - Information Technology Master Plan), setting off within their units the need to adapt their IT structures in order to comply with this plan. The IPEN (*Instituto de Pesquisas Energéticas e Nucleares* - Institute for Energy and Nuclear Research), one of the CNEN units, that has already been working to set up an IT Governance structure, has now to comply with the PDTI-CNEN, and this work, shaped as an analysis of the current state of IPEN's IT Governance and some suggestions of adequacy to the PDTI, is part of its adjustment efforts.

1. INTRODUCTION

The Information Technology Governance (IT Governance) became an important issue at organizations, considering that IT cannot be seen as just a support sector anymore. Its importance goes beyond that, being more and more recognized as a chief strategic concern by the senior management, given its capacity to develop competitive business advantage [1], and in some cases, as being a business enabler [2][3].

In Brazil, the organizations IT budget is increasing steadily (5.3% in 2005 to 6.7% in 2010), along with the number of employees that uses computers (circa 86% in 2010). That growth is probably due to the increase of Internet's importance to organizations, and can be visualized by the number of computers connected to networks (98% in 2010) inside organizations. These data, extracted from [4], can be considered as a sign of recognition from Brazilian senior managers of greater IT importance.

Given its increasing importance, cost and complexity, the Brazilian Federal Executive established standards to make its agencies comply with some of the IT management and governance best practices, currently in the form of its Normative Instruction No. 04, of November 12, 2010. Also, the Brazilian Legislature agency, named *Tribunal de Contas da União* – TCU, that is a Court responsible for auditing government agencies, also recommends constantly those agencies to comply with renowned best practices as CobIT and ITIL (CobIT - Control Objectives for Information and related Technology; ITIL - Information Technology Infrastructure Library).

That is the context where IPEN (*Instituto de Pesquisas Energéticas e Nucleares* – Institute for Energy and Nuclear Research) locates itself. Being subordinated to the same rules of its administrative and financial manager, the CNEN (*Comissão Nacional de Energia Nuclear* – Brazilian National Commission for Nuclear Energy), it has been facing the challenge of adapting to those new regulations and practices. This work aims to explore its current situation by the strategic point of view.

2. IPEN

The IPEN is a São Paulo State Autarchy linked to its State Development Secretary, associated with USP (*Universidade de São Paulo* – São Paulo University) for educational purposes and is managed technically, administratively, and financially by CNEN.

IPEN works in research, development, education and production in the nuclear, energetic and correlated areas. Its budget is passed by CNEN and it also receives funding from research support Agencies, Foundations and partnerships with public and private companies.

Through its plural actuation, IPEN has been contributing in the fields of: nuclear energy in industry, health and agriculture, radiopharmacy, radiochemistry, nuclear physics, biotechnology, laser and applications, chemical technology and environment, material science and technology, nuclear fuels, nuclear reactors and energy systems engineering, radioprotection, radioactive waste, nuclear and radiological metrology and fuel cell and hydrogen [5].

Currently IPEN is the coordinator of the RMB (*Reator Multipropósito Brasileiro* – Multiproposal Brazilian Reactor) project design and construction, whose main purpose is to increase the raw materials domestic production used in the radiopharmaceuticals' production for the Brazilian market, and is one of CNEN priorities [6].

2. CORPORATIVE GOVERNANCE AT IPEN

IT Governance can only be efficiently conducted if there are Corporative Governance processes well define within the Institution.

Corporative Governance at IPEN is at a mature state, where many of its processes is well defined and communicated throughout the Institution, oriented by the IPEN's Master Plans, which are constantly revised.

Techniques such as BSC (Balanced Score Cards) and making annual Management Reports and Action Plans are used in this governance process, making available to the senior management pertinent information to perform strategic analysis.

To perform quality management, IPEN promotes internal audits, and, in some cases, external audits. Because IPEN executes nuclear activities, it is necessary to comply with specific nuclear regulatory standards. Alongside with complying with these standards, IPEN Research Centers concerns to comply with ISO standards, being some of them already certified, and other seeking to acquire those certifications.

Within the strategic context, IPEN divides itself in three purposive areas, or macro-processes, which are:

- R&D&E Research & Development & Engineering
- Products and Services
- Education

R&D&E represents its technical and scientific production, along with its consulting work. Products and Services refer to radiopharmaceuticals production and specialized technological services, like irradiation, material analysis, and others. Its Educational actuation results in human resources formation, through scientific initiation programs, Masters and Doctorates supervisions, and also offering graduation disciplines to USP [5].

With those definitions on hands, it would be already possible to draw an IT Governance strategy to the Institute. But it is also necessary to take into consideration the CNEN's IT Master Plan, that is the great IT changes trigger in all CNEN Units concerning governance, and to consider also the current IPEN's IT Governance development state.

3. IT GOVERNANCE WITHIN BRAZILIAN GOVERNMENT

Currently, Brazilian Government regulates its IT activities by means of its legislation, and by Normative Instructions, which all public agencies must comply.

The recent Normative Instruction No. 4, from November 12, 2010, regulating the IT services contracting and emitted by Federal Executive to its agencies, is maybe the best example of Brazilian Government efforts to establish a good governance practice. It requires, among other things, the definition of the agency's IT Master Plan, the definition of different staff formation specific to each phase of IT services contracting, and other measures aiming to increase the transparency of the contracting process for the Brazilian population.

But a special attention of Brazilian Government to the IT sector dates back to 1997, when it was defined, by law, that the execution of IT services would be preferentially outsourced. This measure was part of the application of the New Public Management concept in Brazil, under the name of "*Reforma de Estado*" (State Reform) [7].

These and other standards altogether forms the current IT scenario within Brazilian Government, and delimit the scope of action possibilities to solve some issues, but at the other hand increases reliability and transparency of public agencies.

4. CNEN IT MASTER PLAN

The IT Governance organization process must establish a connection from IT to the Institution's strategic objectives, and with its purposive areas, in such way to transform IT into a tool of achieving its objectives and goals.

CNEN defined a PDTI (*Plano Diretor de TI* - IT Master Plan)[8] setting IT goals to align IT to its strategic objectives, to be fulfilled during 2010-2012 period. This PDTI defines that IT management at CNEN must use CobIT and ITIL as references.

CobIT measures IT governance processes maturity by a more general concept, based on CMM (Capability Maturity Model), which defines 5 levels of process maturity [9]

These are the two main references used at the private and public IT Market, according to surveys realized between 2007 and 2008 by different companies [10][11], and in the public sector CobIT was implemented with expressive success into important organizations [12]

A brief exposition of what these references are will be presented following.

4.1 COBIT

CobIT aims to be a set of IT Governance best practices, structured to orient some processes considered crucial to perform good governance. It is maintained by ISACA - Information Systems Audit and Control Association, which is an independent non-profit global association, which uses global industries' knowledge of IT best-practices [9].

The 34 key-processes are grouped within four domains, oriented by two objectives each. Those domains are nominated in accordance with these objectives:

- PO Plan and Organize
- AI Acquire and Implement
- DS Deliver and Support
- ME Monitor and Evaluate

4.2 ITIL

The ITIL (Information Technology Infrastructure Library) is also a set of best-practices, but specific to IT infrastructure, operation and maintenance of IT services. It was developed at the end of 1980's by CCTA (Central Computer and Telecommunications Agency) and is currently under the OGC (Office for Government Commerce - England) custody [13].

ITIL seeks to promote client focused management, and IT services quality. ITIL is organized in disciplines, being each discipline a set of processes and general procedures, with which an organization can perform its tactical and operational management aimed at achieving strategic alignment with the business. Some work has been done trying to integrate ITIL to CobIT, tracing a parallel between ITIL and the first two CobIT domains [14], strongly motivated by its recurrent combined use in the organizations, aiming to comply with audit requirements, like Sarbane-Oxley (SOX) [15].

5. IT AT IPEN – 2010

The Information Technology area at IPEN is divided into two administrations: the Systems Development Administration (*Gerência de Desenvolvimento de Sistemas* - GDS) and the Network and Technical Support Administration (*Gerência de Redes e Suporte Técnico* - GRS).

Concerning systems development and maintenance, demands are received by GDS directly from IPEN Centers, and are followed by a meeting to define scope and deadlines to comply with these demands. The demand prioritization is done considering the IPEN's Technical Administrative Council.

The IT infrastructure technology is constantly updated, being a GRS responsibility. The technical support is also its responsibility, counting with a computer system for opening technical calls, available to all IPEN employees at its intranet.

The IPEN efforts to deploy and run IT Governance processes are not recent, given that by the end of 1999, an Internal and Permanent IT Committee was formed (*Portaria* CNEN/IPEN n° 071, of 16/09/99), and its internal regiment was defined at the beginning of 2000 (*Circular* CNEN/IPEN n° 002, of May 11, 2000). Still in 2000, the Computational Resources Regulation was defined and divulged (*Circular* CNEN/IPEN n° 003, of May 11, 2000). The documentation on internal regulation at IPEN is divulged through its intranet, maintained by its internal staff.

In 2010, the French company Bull, at CNEN request, made a strategic and operational analysis of all its Units. That analysis resulted in a series of reports that includes: systems and data bases inventory, IT strategic alignment, among others, which originated the CNEN PDTI.

Several information, useful to orient the direction of IT activities, can be extracted from these reports, concerning both IT strategy and operations within the Institute. This work restrains itself to address only strategic problems. A brief summary of what can be inferred from this information will be presented next.

6. IPEN STRATEGIC OBJECTIVES AND PRIORITIES

The strategic priorities of IPEN IT Governance are directed by CNEN IT Master Plan (CNEN PDTI).

We must remember that, given the unique nature of some IPEN activities, this Institute governance must worry not only in fulfilling the CNEN PDTI, but also in align itself to IPEN peculiarities, in order to aggregate value.

6.1 Current Situation

The IPEN Evaluation of IT Strategically Alignment report, using the CobIT maturity model [9], classified 7 of 10 processes belonging to Plan and Organize domain applying questionnaires to managers of several IPEN areas. The general result was the following:

Process	Description	Classification
PO1	Define a Strategic IT Plan	1,78
PO2	Define the Information Architecture	1,39
PO3	Determine Technological Direction	2,07
PO4	Define the IT Processes, Organization and Relationships	2,76
PO5	Manage the IT Investment	2,62
PO8	Manage Quality	2,87
PO10	Manage Projects	0,89

 Table 1. CMM/CobIT classification to some IPEN IT processes

The first finding arising out of this data is that none of the processes is at the target level defined by CNEN, which is level three. Only three processes are close to this value, which are PO4, PO5 and PO8. The others require more work to reach that mark, and here we suggest some measures to contribute in this sense.

7. REACHING MATURITY THROUGH COBIT

CobIT 4.1 contains some instructions about how to measure the maturity of each one of its processes, based on specific evidence to each maturity level. Using those evidences as a basis, it is possible to identify some measures that could raise the maturity levels of the processes assessed by Bull.

Next, some of these evidences will be specified to each one of the analyzed processes, put in the less to more mature order.

7.1 PO10 – Manage Projects

IPEN manages IT contracts and projects with third parties, within the public management context (open tendering), and the tendency, as a governmental politics for IT, is that a major part of IT services be executed through outsourcing. There are evidences that organizations concerned more with strategic objectives have a bigger satisfaction with outsourcing [16].

Along with the development of strategic IT objectives, committed to support the IPEN strategic planning, it would be desirable to set (or identify and structure) a project management office, to all IT projects. The PMBOK (Project Management Body of Knowledge) approach is recommended.

7.2 PO2 – Define the Information Architecture

It is the job of defining the logical modeling and the syntax of IPEN related data, existing or desired in management systems, to ease the integration and consolidation of these data when necessary.

This work generally is made with most experienced developers and analysts, because they know in a detailed way the existing systems at IPEN.

After reaching a consensus, it is necessary to document the pattern defined to be adopted (Data Dictionary). The Institution needs to divulge it, so the next development works can already be conforming to these patterns, and also to make possible to do an assessment of systems complying or not to it.

An assessment of criticality and sensibility of these data is also recommended (classifying them like: public, confidential, among other patterns).

7.3 PO1 – Define a Strategic IT Plan

The IT Strategic Planning can be made through meetings with the managers, where the plan definitions will be set and a document produced and divulged to the Institution, informing what the IPEN IT strategic and operational guidelines are.

Indicating the IT Strategy relation to the Corporative Strategy is also necessary, making clear how the IT Strategy is designed to support the strategic objectives of the Institute. It is also important that a Risk Assessment be made based on what is being planned.

7.4 PO3 – Determine Technological Direction

A migration, or even a contingency plan can be made, to both computer systems and IT infrastructure, which must be part of the operational planning, which must be specified as a Technology Infrastructure Plan.

7.5 PO5 – Manage the IT Investment

Budget defining politics and processes must be defined, documented and communicated (divulged) through the Institution, to achieve a good maturity classification. The budget must be aligned with the strategic and operational IT plan. It is recommended that training and human resources formation in this area be made, to allow the correct and efficient specification needed to ask for investment on the diverse projects being sought.

Also, it is important to classify strategically the incoming investment requests and plans, and prioritize them in accordance with IPEN's strategic plan [17].

7.6 PO4 – Define the IT processes, organization and relationships

Here is necessary to verify is the role played by each employee is well defined, and must exist a definition of IT work processes. It is needed to expose clearly that the processes here exposed are aligned with the TI strategic planning.

The existence of Steering Committees, internal audits and supplier management is strongly desired [2].

7.7 PO8 – Manage Quality

In this process, IPEN almost reached level 3. The definition of one Quality Measurement System (QMS) documented and divulged could contribute to raise even more this process maturity level.

8. CONCLUSIONS

The CNEN IT Master Plan defines that the measure to be used, with respect to IT development, are the CobIT maturity levels.

Being so, in this work, the main issue was exploring the current IPEN IT state, referring to CobIT maturity levels, and seek to evaluate which would be the points to be improved, and how it could be done.

All the suggestions were made considering the characteristics of a public agency like IPEN, with so many particularities and branches of activities so plural. They need more discussion with IPEN senior IT professionals to deepen the analysis and define best fit action plans.

The consulting company Bull did not evaluate all CobIT processes within IPEN, so new assessments should be made to assure that IPEN will reach the desired maturity level. In the case of IPEN, maturity must be reached step by step, changing the Institution culture gradually, given the idiosyncrasies of the public sector.

Maybe the most important and immediate action to be taken is forming commissions and committees to prioritize actions and actor, defining goals for the short term, given the tight deadlines, but thinking on long term.

But the initiative of the current management of giving a special attention to IT governance is determinant, because it demonstrates that a major important step was given, that is the recognizing by the senior management that IT is not another cost center anymore, but is a decisive part of its strategic process.

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