

**IT GOVERNANCE IN BRAZILIAN PUBLIC ADMINISTRATION: analyzing processes
outcomes for groups of institutions**

FRANCISCO CÉSAR DE CASTRO NETO
UNIVERSIDADE DE FORTALEZA (UNIFOR)

FRANCISCO EBISON SOUTO CANUTO
UNIVERSIDADE DE FORTALEZA (UNIFOR)

PAULO HENRIQUE STUDART PINHO
UNIVERSIDADE DE FORTALEZA (UNIFOR)

CARLOS ALEXANDRE CARVALHO DOS SANTOS
UNIVERSIDADE DE FORTALEZA (UNIFOR)

IT GOVERNANCE IN BRAZILIAN PUBLIC ADMINISTRATION: analyzing processes outcomes for groups of institutions

Abstract

Information technology (IT) is a very relevant aspect to public corporate governance once it is a structure of processes and mechanisms accomplished to identify information technology resources and manage them so to empower general processes governance strategies. Based on this knowledge the present article aims at evaluating Brazilian Federal Public Administration (BFPA) level of IT processes corporate governance by analyzing it as unique variable (general index) and as a sort of variables (factors). Additionally a suggestion of BFPA members division is suggested and a statistical inference method attempts to find out significant means differences among these assembles with regard to level of IT processes corporate governance (general index for each group). For this purpose secondary data from *Tribunal de Contas da União (Brazilian Federal Court of Auditors - BFCA)* IT Governance Report 2016 is studied and object of an ANOVA test so to find out that there is statistically significant means difference. The results came to prove the existence of real levels distinction with regard to governance area according to the nature of company in the context of Brazilian Federal Public Administration.

Keywords: IT Process, Corporate Governance, Public Sector

Introduction

Corporate governance for public organizations is a subject whose relevance has increased in the last years thanks to private companies accountability and transparency importance acknowledgment as a model to be followed, refined and adapted to governmental management practice.

When it comes to public sector and its encompassing (federal, state and municipal spheres) corporate governance finds out extreme usability because of the consequent reliability necessity for public position occupant and public resource trust relationship establishment.

This perspective indorses the appropriate service of watching and surveillance against corruption agencies and strengthens the public corporate governance role as an important platform for governmental regulation (Saidin & Badara, 2014).

Based on this knowledge the present article aims at evaluating Brazilian Federal Public Administration (BFPA) level of IT processes corporate governance by analyzing it as a unique variable (general index) and as a sort of variables (factors).

Additionally a suggestion of BFPA members division is suggested and a statistical inference method attempts to find out significant means difference among these assembles with regard to level of IT processes corporate governance (general index for each group).

In this context and based on the lack of scientific studies that have tested IT processes governance among different public institutions groups, it will be state the following hypothesis:

H₀: There is no statistical significant means difference about IT processes governance among Brazilian Federal Public Administration groups of institutions.

For this purpose secondary data from Tribunal de Contas da União (*Brazilian Federal Court of Auditors - BFCA*) IT Governance Report 2016. This report dealt with 2016 survey data from a population made up of 339 public institutions.

In the sequence of the paper, there will be theoretical and method section to detail the article previous scientific content and methodological aspects. Results and discussion sections come afterwards respectively to demonstrate the analyses outcomes and to promote a debate on findings theoretical and empirical contributions.

IT CORPORATE GOVERNANCE

Public and private organizations are increasingly more dependent on IT to make its activities and processes feasible. Several assets are historically managed by the enterprises like people, capital, facilities, customer relationship, but more recently a new area has risen up concerned about data control collecting, storing and disseminating (Gonçalves, Gaspar & Cardoso, 2016).

Weil & Ross (2004) confirm this point of view when they state the necessity of an IT alignment with the business in order to warrant a complete synchronism between company and its IT processes effective use.

In this sense, IT governance might be defined in different understandings; the first, a decision-making supporting structure that shares responsibility with the executives according to the adopted strategy; the second, a modelling process assemble driven to organization functioning with regard to business alignment adequate resources use (Lunardi, Dolci, Becker & Macada, 2007; Assis, 2011).

Thus, IT governance presents two main objectives, delivering conjoint value to company business strategies and risks mitigation through organization processes responsibility sharing. IT governance displays itself as a tool whose goal is warranting operational and financial data accuracy, reliability, update and availability (Lunardi, Dolci, Becker & Macada, 2007).

Moreover IT governance is part of general corporate governance and managed by it in search of IT driving to comply with management business policies, goals and strategies (Abreu & Fernandes, 2006) as well as this relationship attempts to make IT control, security, traceability and processes transparency feasible (Assis, 2011).

This is why at present IT governance best practices models are quite relevant to private, but also public firms. While in the private sector there is a crescent monitoring demand by shareholders with regard to organizational control, transparency exigence and technology complexity, public business areas by their turn face scenarios equally defiant once auditing pressure rises against failures and frauds in public controlling systems progressively present and efficient (Tarouco & Graeml, 2011).

Within a similar perspective, Papachristou & Papachristou (2014) recognize corporate governance correct practices necessity perspective in public area through

governmental administration purposes and processes complexity existence comprehension.

By this way of thinking, these authors manage to define public CG as a governmental management procedure which attempts to satisfy stakeholders and to optimize public function by public resources administration.

For Madhani (2014), scope main differences between public and private firms are linked to goals, revenues obtaining models and expenditures profile. Yet there are also divergences with regard to costs, property and stakeholders extension.

In this context, information technology (IT) is a very relevant aspect to public corporate governance. According to Campbell, Mc Donalds and Sethibe (2009) IT CG for public sector is a structure of processes and mechanisms accomplished to identify information technology resources and manage them so to empower general processes governance strategies.

Baptista (2005) and Dunleavy & Margetts (2000) explain that only technology equipment and software infrastructure do not perform warranties for the necessary support IT must provide to governance, but inserted in a corporate control program it is able to ensure the necessary efficacy for this purpose.

Peterson (2004) divides IT governance in three categories. For him decision-making structures, processes and relational mechanisms compound its fundamental core.

While **decision-making** affords responsibilities and decision rights related to IT structures and **relational mechanisms** grant the appropriate communication levels throughout organizational environment, **processes** concern about execution, evaluation and direction of IT activities both in public and private firms. (Peterson, 2004; Van Grembergen & De Haes, 2008; Kooper, Maes & Lindgreen, 2011).

The next section describes the methodological process by which the research was conducted in order to achieve the article goal and to test the work hypothesis.

Method

This work was accomplished as a descriptive research aiming at presenting characteristics of a population, phenomenon or study (Bryman & Bell, 2011) and data collection was performed by quantitative method using mathematical language to describe a phenomenon causes, variables relations and other applications (Neuman, 1997).

The secondary data used in this research were extracted from Tribunal de Contas da União (*Brazilian Federal Court of Auditors - BFCA*) IT Governance Report 2016. This national agency has been making systematic studies about the theme in Brazilian Federal Public Administration (BFPA) in recent years.

The study dealt with 2016 survey data from a population made up of 339 public institutions. It is worth pointing out the fact the secondary data hither wielded compassed specifically IT Governance processes from BFPA companies.

BFCA Report questions were grouped in the following dimensions: top management leadership, strategies and plans, information, people, processes and results. The present study picked 76 questions out of IT Governance processes dimension and all of them are related to Federal Government Basic Guidelines (TCU, 2014).

It is worth highlighting the public administrations top managers were the responsables to provide applied questionnaire answers based on available information from their governance and management areas.

Five answers categories depicting practice adoption level were delineated: 1) Not Applicable; 2) No Adoption; 3) Adoption Plan Initiated; 4) Partial Adoption and 5) Full Adoption.

Table 1 below explains the factors associated to IT governance processes extracted from BFCA Report 2016 by describing its meaning to information technology governance practices.

Table 1

IT Governance – Factors Explanation

IT Services Management Process (ITSMP)	It aims at delivering and supporting customer focus IT services through processes oriented approach. In this sense services are supposed to comply with performance and costs requirements. ITSMP deals on business goals supporting services.
IT Services Level Management (ITSLM)	IT Services Level Management might be ascertained as an agreement between the internal IT services supplier and the internal customer/client/user by which the adequate and necessary service level supposed to support the organizational operations is defined.
IT Risks Management (ITRM)	It strives to protect IT assets by recovering information in case of disasters and keeping IT services normally.
Information Safety Corporate Management (ISCM)	Information Safety Corporate Management is influenced by threefold objectives measurement: CIA (Confidentiality, Integrity and Availability).
Software Process (SP)	The activity by which an organization develops/purchases softwares as well as it manages its lifecycle. It embodies software decision, developing, operation and withdrawal phases.
IT Projects Management (ITPM)	It comprises the organizational planned efforts in order to improve processes employing IT tools.
IT Services Hiring (ITSH)	The organizational activity of seeking external solutions in the shape of IT services.
IT Hiring Planning Process (ITHPP)	It comprehends all prospecting, evaluating, comparing and deciding IT services hiring.
IT Contracts Management Process (ITCMP)	With regard on IT Contracts Management Process, it deals with the monitoring of the hired services delivery, quality measurement and internal customers satisfaction.

In terms of data analysis, it was promoted descriptive statistics which according to Martins & Teóphilo (2009) deals with frequency answers measurement. Additionally analysis of variance (ANOVA) was engendered in order to make hypothesis test possible once it allows means difference statistical significance for different groups (Field, 2009).

Both descriptive and inferential analyses were run exploiting software SPSS version 26. The next part of this study will rely on the research outcomes demonstration.

Results

This research was conducted by ‘Tribunal de Contas da União’, a Brazilian bureau whose main activity is auditing national public administration institutions. For its periodic governance, assessment a questionnaire on Information Technology (IT) Good Practices was answered for 339 different public organs regarding to capture IT governance maturity in several aspects.

The chosen area for this paper was IT Governance Processes which focus on analyzing how well implemented IT governance good practices are through a Likert scale that goes from 0 (Not Applicable) to 5 (Full Adoption). Table 2 below demonstrates the segmentation description used in the research.

Table 2
IT Governance – Questions Segmentation

ID	Segmentation Description	Number of Questions
5.1	IT Projects Management	14
5.2	IT Services Level Management	6
5.3	IT Risks Management	5
5.4	Information Safety Corporative Management	21
5.5	Software Process	5
5.6	IT Projects Management	6
5.7	IT Services Hiring	9
5.8	IT Hiring Planning Process	5
5.9	IT Contracts Management Process	5
TOTAL		76

The surveyed companies were also segmented in four different groups of institutions according to their administrative nature (table 3). Thus a first conjunct represented by 53 companies deal on general matters like banking, energy, gas and oil, but they are controlled by government.

The second and more populous assemble (216 enterprises) comprises public organisms related to public administration subjects like ministries, armed forces, public hospitals and universities.

As the third components, judiciary organizations such as labor courts, elections courts and general courts (59 organisms). At last there is the fourth group joined by legislative houses, public auditing companies and NGOs (11 exemplars).

Table 3
Institutions Segmentation

Code	Institutions Segmentation	Total
FPO & MES	Federal Public Organization & Mixed Economy Society	53
ITRAS & FEPO	Information Technology Resources Administration System & Federal Executive Power Organization	216
JPO	Judiciary Power Organizations	59
LEG, FPM & 3S	Legislative, Federal Public Ministry and Third Sector	11
TOTAL		339

Once the data segmentation is already demonstrated, it is possible to begin to explain the sample descriptive statistics. Table 4 organizes the governance achievements percentages in crescent order by general factor assessment and includes likewise the same results for the institutions segmentation.

By analyzing the data from this table, the first impressions might be understood. The general average for governance achievement (here called as IT Process Government General Index) states 71,37%, i. e., in average the sample public companies comply with more than seventy percent of the IT processes government practices.

Table 4

Governance achievement percentage by assessment factors and institutions segmentation

Assessment Factor	Factor Code	Factor Governance %	FPO & MES	ITRAS & FEPO	JPO	LEG, FPM & 3S
IT Services Hiring	ITSH	86,93%	84,50%	86,79%	89,17%	87,27%
IT Hiring Planning Process	ITHPP	78,61%	73,74%	75,35%	80,27%	85,09%
IT Contracts Management Process	ITCMP	76,28%	77,66%	72,26%	70,85%	84,36%
Software Process	SP	72,94%	72,00%	69,67%	72,27%	77,82%
IT Projects Management	ITPM	70,68%	71,18%	61,85%	74,23%	75,45%
Information Safety Corporative Management	ISCM	68,29%	69,17%	64,56%	67,56%	71,85%
IT Services Management Process	ITSMP	64,43%	66,00%	59,30%	63,08%	69,35%
IT Services Level Management	ITSLM	63,52%	64,85%	61,02%	62,43%	65,76%
IT Risks Management	ITRM	60,69%	62,26%	56,89%	60,68%	62,91%
IT Process Governance General Index	ITPGGI	71,37%	71,26%	67,52%	71,17%	75,54%

Nevertheless the different governance factors (here understood as several distinct IT process management areas) float in a continuum which heads from 60,26% until 86,93% and this might be evaluated as an important research feature.

In terms of the general index the processes related to IT service hiring/purchasing (*IT Service Hiring, IT Hiring Process, IT Contracts Management and Software Process*) obtained higher scores when compared to IT service internal management (*IT Projects Management, IT Services Management Process, IT Services Level Management*) and IT Security (*Information Safety Corporate Management and IT Risks Management*).

With regard to the general index of IT processes governance analyzed by the institutions segmentation, it is possible to avouch that the highest scores belonged to *LEG, FPS & 3S* group (75,54%) which not by chance is the smallest group. Indeed the assemble comprises only eleven public organizations extremely well regulated (Brazilian Deputies Congress, Senate, several public ministries and so on), thus this fact might have granted the conjunct a better evaluation.

FPO & MES and *JPO* came after in the allotment once they presented respectively 71,26% and 71,17% as general index of IT processes governance. Also not surprisingly, they possess a resembling number of components (53 and 59 each one). On the other hand, it is paramount to highlight that judiciary power organizations demonstrate a similar IT processes governance level to federal public organizations and mixed economy societies.

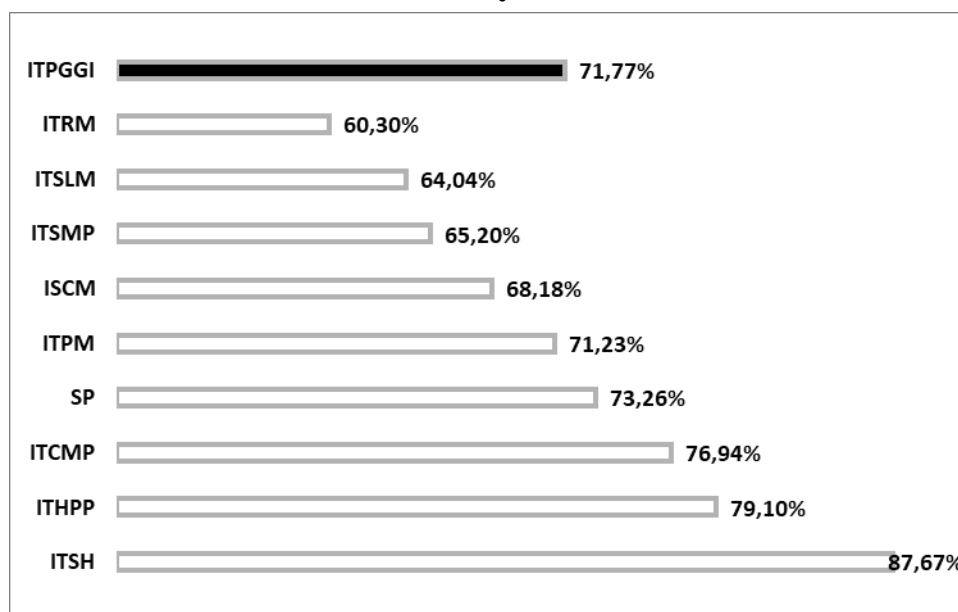
Lastly *ITRAS & FEPO* performed the lowest score for the general index (67,52%). Such a result may possibly be apprehended because of the larger number of companies gathered in the group and the fact they compound several branches of public administration with different maturity, responsibility and auditing levels.

Notwithstanding the foregoing, it is worth mentioning that within the groups there are no outstanding differences about scores distributions for each processes group (the so-called factors), that is to say once more time the processes related to IT service hiring/purchasing obtained higher scores when compared to IT service internal management and IT Security.

Figure 1 below displays graphically the factors achievement percentages comparison taking the general index as the benchmark. Namely, processes related to IT service hiring/purchasing exhibit longer bars than IT service internal management and IT Security ones.

Nonetheless, the descriptive statistics so far scrutinized are able to offer an initial perspective, it is imperative to make use of inferential methods to assure results discussion necessary accuracy.

Figure 1
IT Processes Governance Results By Factors



In order to compare the different group of institutions scores with regard to IT processes governance outcomes, Analysis of Variance (ANOVA) was chosen as the statistical technique because of its characteristic of testing through robust calculus the statistical significance of distinct groups means (Field, 2009).

Table 5
Levene's Test

Factor	Levene Statistic	df1	df2	Sig.
IT Services Management Process	3,214	3	335	0,23*
IT Services Level Management	1,403	3	335	0,242*
IT Risks Managemnt	0,675	3	335	0,568*
<i>Information Safety Corporative Management</i>	2,938	3	335	0,033
Software Process	0,597	3	335	0,618*
<i>IT Projects Management</i>	3,671	3	335	0,013
<i>IT Services Hiring</i>	4,527	3	335	0,004
<i>IT Hiring Planning Process</i>	5,277	3	335	0,001
<i>IT Contracts Management Process</i>	4,694	3	335	0,003
<i>IT Process Governance General Index</i>	4,479	3	335	0,004

For this attempt, it is necessary to perform Levene's Test to verify the groups variances homogeneity so to find out if this measure is not violated and able to guarantee data trustworthiness.

Table 5, for this purpose, informs that four factors data deny the homogeneity variances hypotheses (*ITSMP*, *ITSMLM*, *ITRM* and *SP*). This way for these ones will be run the normal F Test for ANOVA. In turn the other processes assembles (*ISCM*, *ITPM*, *ITSH*, *IHPP* and *ITCMP*) do not pass the test and will be analyzed by Welch's F Test.

Table 6
ANOVA Test

Factor		Squares	df	Average	F	Sig.
IT Services Management Process	Between Groups	7	3	2,45	4,585	,004
	Within Groups	179	335	0,53		
	Total	186	338			
IT Services Level Management	Between Groups	2	3	0,67	,957	,413
	Within Groups	234	335	0,70		
	Total	236	338			
IT Risks Management	Between Groups	5	3	1,50	2,210	,087
	Within Groups	228	335	0,68		
	Total	232	338			
Information Safety Corporative Management	Between Groups	4	3	1,25	2,462	,062
	Within Groups	170	335	0,51		
	Total	174	338			
Software Process	Between Groups	3	3	0,85	,966	,409
	Within Groups	295	335	0,88		
	Total	298	338			
IT Projects Management	Between Groups	25	3	8,43	10,926	,000
	Within Groups	258	335	0,77		
	Total	284	338			
IT Services Hiring	Between Groups	2	3	0,51	1,180	,317
	Within Groups	145	335	0,43		
	Total	146	338			
IT Hiring Planning Process	Between Groups	6	3	1,94	2,660	,048
	Within Groups	244	335	0,73		
	Total	250	338			
IT Contracts Management Process	Between Groups	7	3	2,45	3,136	,026
	Within Groups	262	335	0,78		
	Total	269	338			
IT Process Governance General Index	Between Groups	4	3	1,24	3,314	,020
	Within Groups	126	335	0,38		
	Total	129	338			

Table 6 demonstrates ANOVA Test for all the factors. For a better disclosure and in order to make easier the comprehension, the items which passed Levene's Test were highlighted in gray; the remaining ones are displayed in white.

As a result, only the factors whose names are printed in bold letters passed the statistical significance criterion, that is to say, ITSMP is the only factor among these ones Whose statistical significance criterion is obeyed, that is to say, ITSMP is the only factor among these ones here tested that shows a statistically significant means difference between the four groups of institutions.

Table 7
Welch's Robust Test

Factor		Statistic	df1	df2	Sig.
IT Services Management Process	Welch	4,631	3	42,435	,007
	Brown-Forsythe	4,593	3	112,694	,005
IT Services Level Management	Welch	,783	3	41,058	,510
	Brown-Forsythe	,849	3	71,224	,472
IT Risks Managemnt	Welch	2,083	3	42,153	,117
	Brown-Forsythe	2,257	3	101,027	,086
Information Safety Corporative Management	Welch	2,253	3	41,648	,096
	Brown-Forsythe	2,374	3	78,839	,076
Software Process	Welch	1,177	3	42,873	,330
	Brown-Forsythe	1,092	3	103,849	,356
IT Projects Management	Welch	11,102	3	41,177	,000
	Brown-Forsythe	9,792	3	73,050	,000
IT Services Hiring	Welch	1,691	3	44,177	,183
	Brown-Forsythe	1,621	3	103,312	,189
IT Hiring Planning Process	Welch	3,513	3	43,004	,023
	Brown-Forsythe	3,145	3	87,581	,029
IT Contracts Management Process	Welch	4,260	3	43,842	,010
	Brown-Forsythe	4,045	3	105,636	,009
IT Process Governance General Index	Welch	3,843	3	42,580	,016
	Brown-Forsythe	3,472	3	98,633	,019

In the sequence table 7 exposes the Welch's Robust Test for the items that failed Levene's Test. Similarly, to the previous explanation, once again, the factors which passed Homogeneity Variances Test were highlighted in gray, the remaining ones are displayed in white.

As a result, only the factors whose names are printed in bold letters passed the statistical significance criterion, that is to say, ITPM, ITHPP and ITCMP shows a statistically significant means difference between the four groups of institutions.

Representing all the factors average value, IT Process Governance General Index (ITPGGI) also passed Welch’s Robust Test which allows to asseverate that, taken in a general outlook, the IT processes governance also exhibits statistically significant means difference among the four groups.

Table 8
Complete Analysis on Assessment Factors

Assessment Factor	Factor Code	Factor Governance %	FPO & MES	ITRAS & FEPO	JPO	LEG, FPM & 3S
IT Services Hiring	ITSH	86,93%	84,50%	86,79%	89,17%	87,27%
IT Hiring Planning Process	ITHPP	78,61%	73,74%	75,35%	80,27%	85,09%
IT Contracts Management Process	ITCMP	76,28%	77,66%	72,26%	70,85%	84,36%
Software Process	SP	72,94%	72,00%	69,67%	72,27%	77,82%
IT Projects Management	ITPM	70,68%	71,18%	61,85%	74,23%	75,45%
Information Safety Corporative Management	ISCM	68,29%	69,17%	64,56%	67,56%	71,85%
IT Services Management Process	ITSMP	64,43%	66,00%	59,30%	63,08%	69,35%
IT Services Level Management	ITSLM	63,52%	64,85%	61,02%	62,43%	65,76%
IT Risks Managemnt	ITRM	60,69%	62,26%	56,89%	60,68%	62,91%
IT Process Governance General Index	ITPGGI	71,37%	71,26%	67,52%	71,17%	75,54%

Table 8, in turn, reveals the final and complete analysis for the IT processes governance factors for the researched organizations. There is a 71,37% of compliance with IT processes governance in these public companies.

While the highest scores are registered in legislative, federal public ministries, third sector organizations and the lowest were found out in federal executive power organizations, the outcomes intermediate regions are represented by federal public organizations, mixed economy societies and judiciary power organizations.

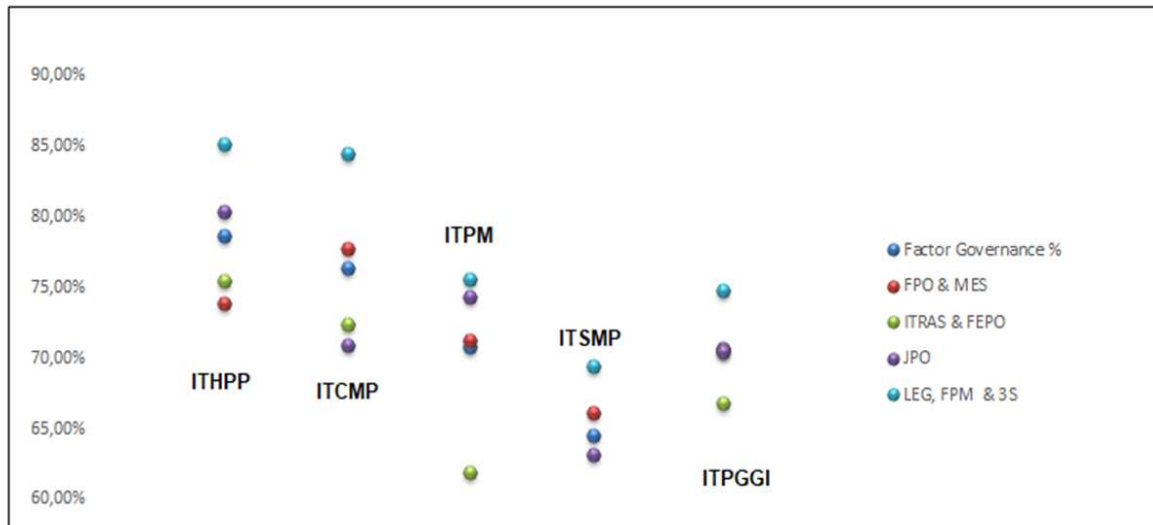
Both general index and institutions segmentation results show that the processes related to IT service hiring/purchasing (*IT Service Hiring, IT Hiring Process, IT Contracts Management and Software Process*) obtained higher scores when compared to IT service internal management (*IT Projects Management, IT Services Management Process, IT Services Level Management*) and IT Security (*Information Safety Corporate Management and IT Risks Management*).

Through ANOVA and Welch’s Robust Tests for the factors taken individually only IT Hiring Planning Process (ITHPP), IT Contracts Management Process (ITCMP), IT Projects Management (ITMP) and IT Services Management Project (ITSMP) passed the statistical significance criterion and represent proven different means among the institutions groups.

Representing all the factors average value, *IT Process Governance General Index (ITPGGI)* also passed Welch’s Robust Test which allows to asseverate that, taken in a general outlook, the IT processes governance also exhibits statistically significant means difference among the four groups.

Similarly, figure 2 displays graphically the research outcomes summary by demonstrating the statistically significant factors for which the mean is different among the institutions groups and its percentual relation to the IT process governance general index.

Figure 2
IT Processes Governance Results By Factors



From this point on the conclusions section will detail the outcomes so far described.

Conclusions

The results above demonstrated bring relevant questions to be examined from now on. Firstly the value attributed to the general IT processes corporate governance for the expressive number of sample companies reveal a consistent outcome (71,37%) which means approximately 3,56 in average for the scale and positions itself in the right middle between *Adoption Plan Initiated* and *Partial Adoption*. The fact seems to reflect a development ongoing process for information technology governance.

What can be considered a relevant finding, the preponderance of IT service related to hiring/purchasing (*IT Service Hiring, IT Hiring Process, IT Contracts Management and Software Process*) in terms of process governance level over IT service internal management (*IT Projects Management, IT Services Management Process, IT Services Level Management*) and IT Security (*Information Safety Corporate Management and IT Risks Management*) deserve a deeper contextualization and new researches.

Apparently external processes acquired receive a stronger governance treatment than internal ones since the procurement activities until the contracts administration. A possible explanation may explore Brazilian regulation about public goods purchase and services acquisition as a pressure driver so to motivate such a behavior.

On the other hand *IT Security* presenting shrunken cyphers may point out the requirement of stronger IT processes governance policies and the matter deepening.

When it comes to analyze the data divided into institutions groups the resulting scores are not exactly surprising when one verifies the groups size and nature.

LEG, FPS & 3S group comprising only eleven public organizations extremely well regulated presents the highest general score while *FPO & MES* and *JPO* came after informing that judiciary power organizations demonstrate a similar IT processes governance level to federal public organizations and mixed economy societies.

Lastly *ITRAS* & *FEPO* performed the lowest score possibly due a more heterogeneous assemble once it is compound by several branches of public administration with different maturity, responsibility and auditing levels.

Finally it is possible to discuss the article hypothesis described once again below:

Ho: There is no statistical significant means difference about IT processes governance among Brazilian Federal Public Administration groups of institutions.

The inquiry about the IT processes governance among the group of institutions investigated reported a statistically significant means difference that proves the existence of real levels distinction with regard to this governance area according to the nature of company in the context of Brazilian Federal Public Administration. Therefore this hypothesis was denied.

Theoretically, this finding seems to verify the importance of the public sector in which the enterprise is allocated as a mechanism of motivation for IT processes governance development as well as the compliance stage found out in the processes that are already implemented.

Also it is supposed to represent a meaningful fact, although no inferential test was run in this sense, the preponderance of external IT processes governance factors when compared to internal ones.

In feasible terms, it is worth notifying Brazilian public administration to the absence of a higher level of IT Security governance level and the conceivable trouble this situation may bring to governmental management. Furthermore a suitable reflection for public agents would be knowing the reasons by which there is a higher level of process governance when it comes to hiring services than to the inside leadership concerning to management and level of service.

References

- Assis, C. B. (2011). *Governança e Gestão da Tecnologia da Informação: Diferenças na Aplicação em Empresas Brasileiras*. (Master's Thesis). Escola Politécnica de São Paulo, São Paulo, SP, Brazil.
- Baptista, M. (2005). E-government and state reform: Policy dilemmas for Europe. *The Electronic Journal of e- Government*, 3(4), 167-174.
- Bryman, A., & Bell, E. (2011). *Métodos de pesquisa de negócios* (3rd ed.). New York: Oxford
- Campbell, J., McDonald, C., & Sethibe, T. (2009). Public and private sector IT: Identifying contextual differences. 16(2), 5-18.
- Dunleavy, P. & Margetts, H. (2000). The advent of digital government: Public bureaucracies and the state in the internet age, *Paper to Annual Conference of the American Political Science Association*, Washington, USA.
- Field, A. (2009). *Descobrendo a Estatística usando o SPSS*. Porto Alegre: Artmed.
- Gonçalves, A. de P., Gaspar, M. A. & Cardoso, M. V. (2016) Governança de Tecnologia da Informação: Uma Análise do Nível de Maturidade em Empresas Atuantes no Brasil. *Gestão e Projetos – GeP*. 7(1). 56-69.

- Kooper, M. N., Maes, R., & Lindgreen, E. E. O. R. (2011). On the governance of information: Introducing a new concept of governance to support the management of information. *International Journal of Information Management*, 31(3), 195–200.
- Lunardi, G. L., Dolci, P. C., Becker, J. L., & Macada, A. C. G. (2007). Governança de TI no Brasil: uma análise dos mecanismos mais difundidos entre as empresas nacionais. *Simpósio de Excelência em Gestão e Tecnologia*. Resende, Brazil, 4.
- Madhani, P. (2014). Corporate governance and disclosure: Public sector x private sector. *SCMS Journal of India Management*, 11(1), 5-20.
- Martins, G. de A., & Theóphilo, C. R. (2009). *Metodologia da investigação científica para ciências sociais aplicadas*. São Paulo: Atlas.
- Neuman, L. W. (1997). Métodos de pesquisa social: abordagens qualitativas e quantitativas (3rd ed.). Boston: Allyn & Bacon
- Papachristou, G., & Papachristou, M. (2014). The worthiness of corporate governance in public sector: the case of public healthcare sector in Greece. *Corporate Ownership & Control*, 12(1), 490- 501.
- Peterson, R. (2004). Crafting information technology governance. *Information Systems Management*, 21(4), 7–23.
- Saidin, S. Z., & Badara, M. S. (2014). Assessment of the principles of corporate governance practice in the public sector organizations in a developed domain. *Journal of Public Policy and Governance*, 1(1), 7- 13.
- Tarouco, H. H., Graeml, A. R. (2011). Governança de tecnologia da informação: um panorama da adoção de modelos de melhores práticas por empresas brasileiras usuárias. *RAUSP*, 46(1), 7-18.
- TCU – Tribunal de Contas da União. (2014). *Referencial básico de governança do TCU – 2014*. Retrieved from <https://portal.tcu.gov.br/biblioteca-digital/referencial-basico-de-governanca.htm>.
- TCU – Tribunal de Contas da União (2016). Levantamento de Governança de TI 2016.
- Van Grembergen, W., & De Haes, S. (2008). *Implementing Information Technology Governance: Models, Practices, and Cases*. New York, NY: IGI Publishing.
- Weill, P., & Ross, J. W. (2004) *IT Governance: how top performers manage IR decision rights for superior results*. Boston: Harvard Business School Press.