Fiscalização a serviço da sociedade

REVISTA do TCU

Federal Court of Accounts Journal • Brazil • year 47 • Issue nº 133 • May/August 2015 • English version

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Federal Court of Accounts

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Mission Statement
Improving the Public Administration for the benefit of society through external oversight

Vision Statement
To be a reference in promoting an effective, ethical, agile and responsible Public Administration

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Letter to the Reader

Bruno Spada

Aroldo Cedraz de Oliveira
President of the Federal Court of Accounts – Brazil and Supervisor of the Editorial Council of the TCU Journal

Dear reader,

This issue of the *TCU Journal* covers two topics that are of great importance to Brazilian society and to the Public Administration. They have an impact on the social and economic development of the country: **ethics and innovation**. Our intention is to show that such topics need to be present in the Court's actions. This occurs because we attempt to continuously improve oversight of public expenditures and, at the same time, be agents of change of the Brazilian State, with constant innovation and following the principles of legality, ethics and transparency.

For External Control, professional ethical behavior is a key element to make oversight more and more relevant and useful in facing the challenges that are inherent to oversight of the public sector. Society has high expectations regarding the oversight agencies and the correct conduct on the part of its members is essential in order to gain the confidence and cooperation of the social players. Therefore, the Courts of Accounts must be model organizations and lead by example in Public Administration.

Innovation in the Court must be understood as the process of transforming a new idea into solutions that will ensure improvement of the methods and techniques used when performing oversight. With this in mind, our Court created the Center for Research and Innovation - CePI, whose main mission is to promote improvement of the oversight activity and of state management. The CePI acts mainly through the Innovation and Co-participation Laboratory - coLAB-i, where we seek to encourage creativity in an environment that is conducive to development of new ideas, focused, especially, on the use of technological resources as an important tool to strengthen External Control.

Out of the articles in this issue I would like to highlight three that represent the importance of the topics covered in this Journal and that are consistent with the moment the Court is going through.

In the article "How to audit ethical performance in a public agency – a proposal", the author writes about the importance and challenges of auditing the implementation of ethical principles in the public sector.

In "The use of geotechnologies as a new tool for External Control" the author presents innovations that will contribute to improving the oversight actions carried out by the Court, such as remote sensing with geoprocessing techniques and application of multicriteria analysis for geographic information. Such technological solutions will provide, among other benefits, an increase in the oversight capacity and the expansion of the spatial scope of control and real time verification of critical activities.

In turn, the article "Innovation, transparency, and citizen participation in the oversight activities performed by oversight agencies: the portal *Contraloría y Ciudadano*, of the Comptroller General of the Republic of Chile", discusses the importance that has been given to the use of information and communication technologies to increase citizen participation and to provide space for interaction between the Government and society, based on transparency, accountability and social control.

With respect to the highlights, I would like to point out the important election of the Federal Court of Accounts – Brazil to the Presidencies of the Capacity Building Committee of the Organization of Latin American and Caribbean Supreme Audit Institutions - CCC/Olacefs and the Professional Standards Committee of the International Organization of Supreme Audit Institutions - PSC/Intosai.

I also consider equally relevant the interview given by Minister Bruno Dantas, in which he talks about aspects of his life story as well as his performance in topics that are very important to this Court, such as health and digital inclusion.

Enjoy the reading!

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Bruno Dantas
Minister of the Federal Court of Accounts of Brazil

Bruno Dantas has a notable career as a public servant and specialist in civil law. He is the youngest minister ever to take office at the Federal Court of Accounts – Brazil (TCU). He has 11 years of experience as a legislative aide, four of which as the Chief Legislative Aide of the Senate. He also worked at the National Council of the Public Ministry (CNMP) and National Justice Council (CNJ). Since 2014 in TCU, Dantas carries out his role combining in-depth knowledge of the practical aspects of the law and the theoretical framework that is the basis for legal doctrine and academic studies This is a result of his doctor's and master's degree in Civil Procedural Law, from the São Paulo Catholic University (PUC-SP). His is a university professor and teaches classes in undergraduate and graduate courses. He is the author of several books and scientific articles. As a TCU minister, he performs in areas that have a great potential for innovation, such as telecommunications and digital inclusion, as well as areas that pose significant ethical challenges, such as judicialization of health. In this interview for the TCU Journal, minister Bruno Dantas comments on relevant topics related to the current moment in the Country, talks about his career and about results obtained in TCU audits.

1. You are the youngest minister of the Court. It was like that in the Federal Court of Accounts (TCU), in the Senate's Office of Legislative Aides and in the National Justice Council (CNJ) and the National Council of the Public Ministry (CNMP). Your successful history in the Public Administration started early, at age 20, in a high school level examination for admission to the Justice Court of the Federal District (TJDF), where you worked in the Family Court in Samambaia, a city of the Federal District. How do you think that the concepts of ethics and innovation made a difference in your career?

I was raised in a low-income family and, though I was born in the capital city Salvador, I spent all my childhood and adolescence in the interior of Bahia, in Feira de Santana. When I moved to the Federal District, I was only 19 years old and I went to live in Taguatinga, where I lived from 1998 to 2003. In spite of the financial hardships and sacrifices, my parents always managed to provide me with good education and I always thought that studying hard and focusing on the preparation for a good career in the public sector would be the best way to show them that the investment had paid off. As my family had no tradition whatsoever in the legal area – my mother was a bank employee

and my father, a dealer, and I was the first person in the entire family to earn a higher education degree -, I always knew that I would have to build my own path. Of course, I came across brilliant and generous people throughout this journey, people who taught and helped me a lot. Looking back, I see that I would not have had so many good opportunities if people had not seen me as a determined, honest, and capable person. Whenever possible, I try to repay the success I have had in life by encouraging and advising my students, collaborators and friends. I truly believe that the world is full of opportunities and we definitely need enthusiasm to pursue good objectives and a little bit of luck to come across good people who may, although subtly, suggest us safe paths to follow.

2. You were the rapporteur of a major telecommunications audit, in the data collection modality. This work resulted in an executive Summary of the digital inclusion public policy, and was the basis for the Public Dialogue event carried out by the Federal Court of Accounts (TCU). In this event, participants discussed issues related to the management of the digital inclusion public policy, issues related to infrastructure and access policy; in addition to issues related to digital content and literacy What would you highlight of this work in the field of innovation?

The change of attitude. Especially on the part of the court as a result of the audits that it conducts, regarding the successful implementation of a digital inclusion public policy capable of overcoming the challenges posed by the current reality in Brazil and that effectively achieves its goals. This is actually innovation. The studies conducted in this area, consistent with the importance of the use of information and communication technologies for the economic, social, and political growth of the country stood out in the audit, which resulted in the Judgment (Acórdão) 2.151/2015 – Plenário. The audit modality was data collection, conducted by the Department of External Control - Civil Aviation and Telecommunications Infrastructure (SeinfraAeroTelecom), specialized and responsible for overseeing the policies and actions related to the digital inclusion policy of the federal government. The work of the audit team allowed us to define the fundamental bases for a successful digital inclusion public policy, in addition to identifying the possible challenges to be faced in the future, not only by the TCU, but also by all players committed to the success of this policy.

"The issues related to the Judicialization of Health, limits, possibilities and impacts of this phenomenon, could not go unnoticed within the TCU, which prompted the performance of the "Public Dialogue" on the theme. In summary, the debates addressed aspects such as the challenges resulting from the phenomenon of Judicialization of Health, the health mediation as an alternative, as well as the reflection and presentation of good practices, paths to be followed and possible solutions."

3. Another major debate coordinated by you within the court was connected with the Judicialization of Health. Notwithstanding the ethics and the use of innovation in the resolution of health issues within the Judiciary, what would you highlight of the discussions raised in another recent TCU event, the Public Dialogue – Judicialization of Health?

The issues related to the Judicialization of Health, limits, possibilities and impacts of this phenomenon, could not go unnoticed within the TCU, which prompted the performance of the "Public Dialogue" on the theme. In summary, the debates addressed aspects such as the challenges resulting from the phenomenon of Judicialization of Health, the health mediation as an alternative, as well as the reflection and presentation of good practices, paths to be followed and possible solutions. It is evidently a complex issue, which involves the Society, the Public Administration and the Judiciary. This is so because the concretization of the fundamental right to health, in this perspective, involves different players. Among them, the person entitled to the right to health, which may be represented by a private lawyer or by the Public Defender-, the Public Prosecutor's Office – in the defense of inalienable individual rights, in addition to homogeneous, social, diffuse and collective rights -, the

federal state responsible for the provision of the health service-, the Federal Government, the States, the Municipalities, in the concurrent competence-, and the judging authority – state and federal judges and tribunals. In addition to the complexity resulting from the plurality of characters involved, the debate on the Judicialization of Health becomes even more intricate and controversial in light of a clear dilemma, which is the right to health, the limit of resources to concretize this right, as well as the issue of the concretization of the right of an individual and the exercise of the collective right to health. Taking this context into account, I understand that it is essential to reflect and present a coordinated action which involves these different players, for the improvement of the activities conducted, taking into consideration all the dimensions of the right to health and maximizing the use of the available resources.

4. Taking into account the activity conducted by the Judiciary, how is the issue of the Judicialization of Health faced?

When conducting a historical digression about the Judicialization of Health in Brazil, we may highlight that, for some time, the judicial action had been strongly oriented by the very personal convictions of the judges, with no major concerns about the overall effects of this individual and pulverized action on the public policy as a whole. Undoubtedly, this activism caused the decisive expansion of the health services by the judicial way, in several areas, with one of the paradigmatic instances being the acknowledgement of the responsibility of the Government to grant antiretroviral medication to HIV patients. In the past years, however, the Judiciary has wished to act in a systematic way, with the goal of presenting to Society decisions that are not made in an "isolated" manner. Today, the Judiciary is increasingly aware of its responsibility to standardizing the jurisprudence and to keeping it stable, integral and coherent, fundamental aspects in the concretization of the principles of juridical security, effectiveness and isonomy. The judicial protagonism, in terms of health, required the setting up of a more coordinated and strategic action. This is what one may clearly notice these days.

5. How does the National Justice Council present itself when analyzing the phenomenon of the Judicialization of Health in Brazil?

Before becoming a Minister of the TCU, I was an Advisor of the National Justice Council (CNJ) for two years, as a representative of society appointed by the Federal Senate, and I more systematically the action of the Judiciary, with a view to establishing a participated actively in an assignment, which makes me very proud. Throughout the past decade, The National Justice Council (CNJ) has led and encouraged "Judiciary Health Policy". The strategies involve from the creation of the National Forum of the Judiciary for the Health as well as State Health Committees up to recommendations on how the judges can decide the demands under their responsibility. With the commitment of the National Justice Council, it has been devised a judiciary policy that involves not only the action of the legal institutions, but also its interface with political and participative institutions.

6. Amongst the several suggestions presented by the CNJ, indicate one that is an example of an innovative action within the Judiciary?

Amongst the several actions taken, we may highlight that in 2010, the CNJ published Recommendation nº 31, with a view to providing guidelines to the tribunals in relation to the performance of actions that helped the magistrates in their decisions. Among other actions, this Recommendation encouraged the tribunals to enter into covenants with the goal of providing technical support comprised of physicians and pharmacists to assist them in the analysis of the clinical issues presented by the parties, taking into consideration the regional peculiarities. It is an innovative step, because by acknowledging the technical-scientific complexity of the issues related to the right to health, it is established a mechanism of collaboration between the judging authority and experts who might provide essential information for the proper resolution of the conflict.

Which other recommendations presented by the CNJ deserve to be highlighted, taking into account the action of the magistrates when facing issues related to the right to health.

In addition to collaboration based on technical support, as mentioned, the CNJ listed measures that the magistrates and tribunals should consider. For instance, (i) informing the cases, as much as possible, with medical reports, description of the disease - including the ICD (International Classification of Diseases) code - prescription of drugs - with generic name or active principle - products, orthoses, prostheses and inputs in general, with exact dosage; (ii) avoiding authorization of drugs that have not yet been registered by the Anvisa (Brazilian Health Surveillance Agency), or that are in experimental phase, except in the cases expressly defined in the legislation; (iii) when-

ever possible, and preferably via an electronic medium, listening to the public managers before analyzing emergency measures; (iv) including legislation related to health law in the administrative law program of the respective public examinations for admission to the career of magistrate, in addition to incorporating health law in the capacity building and improvement programs of the, magistrates; (v) visits by magistrates to the Municipal and State Health Councils, as well as to the public health centers or to those centers associated to the Unified Health System (SUS), to drug dispensaries and to hospitals capable of providing Oncology services like the Unit of High Complexity Assistance in Oncology (Unacon) or the Center of High Complexity Assistance in Oncology (Cacon).

7. Currently, as a result of your initiative and having you as the rapporteur, the TCU is conducting, the first audit related to the quality of the mobile telephony service in Brazil. What led you to make this proposal?

Brazil has been undergoing in the past decades a healthy denationalization process of public services. The first stage of this process was fundamentally focused on the universalization of the services and, in order to achieve that, it was important the establishment of goals to be fulfilled with the passing of time. However, this universalization has often been achieved at the expense of quality, and this is the general perception of society in the field of mobile telephony. My idea was to create an audit matrix, together with the TCU technical staff, to reflect indicators that have more correlation with the life of the citizen. This would make it possible to assess whether or not ANATEL (the National Telecommunications Agency) has been satisfactorily fulfilling its legal duty of ensuring that the telephone companies provide a quality public service to the Brazilian population.

"The Brazilian legal framework is quite complex and the administrative law rules assign to the Government negotiating supremacy and power of empire precisely because it represents the whole of the citizens. However, those same rules bureaucratize and restrict the flexibility and the agility of the Government to a great extent with the purpose of preventing misconduct, like corruption"

8. One of the recurrent themes in the TCU Plenary in 2015 was the condemnation of the use by the public authorities of Special Purpose Entities, the so-called SPEs, with private companies with the goal of bypassing the bidding process requirement. How do you analyze this phenomenon?

The Brazilian legal framework is quite complex and the administrative law rules assign to the Government negotiating supremacy and power of empire precisely because it represents the whole of the citizens. However, those same rules bureaucratize and restrict the flexibility and the agility of the Government to a great extent with the purpose of preventing misconduct, like corruption. Therefore, it is common the view that, when compared to the private companies, the Government action is heavy and slow. The fact is that this modeling has a reason and the managers often do not accept it and intend to obtain the best of both worlds. In an attempt to escape the rigor of the bidding law, some state-owned companies like Petrobras, Caixa and Correios, have been resorting to a sophisticated, although condemnable, resource. Instead of purchasing a product or hiring services through a bidding process, they choose to pick a private partner and constitute with this partner a Special Purpose Entity with minority participation of the state-owned company. With this distribution of the social capital, the new company then becomes a private law entity. However, in order for this SPE to be hired by the public authorities, it would have to participate in and win a public bid. Now comes the cunning that the TCU has been condemning: a shareholder's agreement is made in order to transfer the formal control of the entity to the state-owned company thus artificially fabricating the hypothesis of waiver of bidding process defined in tem XXIII, article 24 of Law 8,666. As rapporteur, I observed this resource in two cases and I order that the TCU General Secretariat of External Control (SEGECEX) conduct a survey in order to learn how many similar corporate structures exist in the Country. From this result, we will find out the exact dimension of the maneuver and decide what to do in order to curb this illicit practice.

TCU now presides strategic committees of INTOSAI and OLACEFS

67th INTOSAI Governing Board Meeting in Abu Dhabi

The Federal Court of Accounts (TCU) has been prominent in the international organizations in which it participates due to its leadership in capacity building and qualified training of its technical body. Its importance is corroborated by the fact that, in an event of the International Organization of Supreme Audit Institutions (Intosai), held in Abu Dhabi, in the United Arab Emirates, on November 10 and 11, 2015, TCU was elected to preside over Intosai's Professional Standards Committee (PSC).

The court was likewise elected by unanimous vote on October 5 to preside over the Capacity Building Committee (CCC) of the Organization of Latin American and Caribbean Supreme Audit Institutions (Olacefs) for the years of 2016 to 2018. On that occasion, President Aroldo Cedraz pointed out the technical aspect of the election of the Court to such duty, the results already obtained by means of online courses offered by the latter and coordinated audits, as well as the opportunity to cooperate more closely in the institutional and professional development of the audit departments of the region.

STRATEGIES FOR OLACEFS

Among the initiatives and strategic priorities presented in the document for Olacefs, the regional bloc that it presides over, TCU emphasized the purpose of systematizing CCC initiatives based on the capacity building cycle of ISO 10015 rule (that includes the detection of needs and assessment of results, in addition to monitoring in all stages) and enforcing technological and pedagogical innovation in actions of Olacefs for building capacity in order to reach a larger number of auditors, as well as to obtain qualitative advances.

In the abovementioned document, TCU also proposes to develop a government audit graduate program, promote audit research and innovation, and cooperate in the development of an international certification for auditors, as well as to strengthen the key role and articulation of CCC in Intosai. These proposals were discussed in the annual on-site meeting of CCC, held in October in Santo Domingo, Dominican Republic. The Supreme Audit Institutions (SAI) part of the committee must prepare the first draft of an Annual Operating Plan (AOP) for 2016, with the purpose of proceeding with the activities in progress – including coordinated audits and online courses – and incorporating some of the new initiatives presented by TCU.

TCU adopts data analysis models and tools to improve its audits

Analyzing both data and information is a routine task for an auditor of the Federal Court of Accounts of Brazil (TCU). This is what happens, for example, when the auditor compares prices offered in a public bid to those seen in the market, or whenever assessing whether the administrative acts performed by civil servants comply with current legislation. Nowadays, most of the administrative acts and facts - the object of analysis of auditors - are digital and are registered in often flawed and inconsistent information systems. This situation demands a new way to work, since analyses of information tend to become both more comprehensive and difficult. In such cases, in order to improve the efficiency of our work, it is essential to use specialized methods and technology tools to improve effectively our assessments.

In order to face the increasing complexity of public administration problems, TCU has been investing to become an even more intelligent

institution that plans and executes its oversight activities with the help of data analysis techniques and tools. Among such measures, it promotes the strategy known worldwide as Data Analytics. We are positive that the combination of technical expertise in the area of oversight and the skills to use technology tools will allow the oversight tasks of the Court to be performed in a faster, cheaper and more sophisticated way.

Rainerio Rodrigues Leite, Secretary-General of the External Control Secretariat (SEGECEX), sees this field as one of the greatest advances of external control history. "The digital revolution has provided the world with a radical change in the treatment of information. Data and information that were once only available to few people or were virtually impossible to assess are now a thing of the past. Any and all information available in digital form - whether structured or not, in large or small amount - can be accessed and analyzed by computers. It was virtually impossible for an auditor to carry out this work alone. Now, auditors can use a series of analyses that can be interpreted and used in their work," the secretary states.

TCU is an extremely stimulating environment for the development of these tools and methods. Rodrigues points out that besides including the improvement of technology tools in the Court's Strategic Plan ("Improving the use of Information Technology-IT as an innovation tool for control"), TCU's current administration, especially its president Mr. Aroldo Cedraz, has provided all necessary support for training, appointing and allocating expert civil servants to provide

technological tools for the improvement of the Court's line of work.

The Secretary adds that some departments of the court have already started to perform data analysis aimed at improving external control, thus, fostering more effective actions. Among such departments are the Departments of External Control - Environment and Agriculture (SecexAmbiental), Government Procurement (Selog), Personnel Actions (SEFIP), Information Technology (Sefti) and Social Security, Labor and Welfare (SecexPrevidência), among others. "Just to give you a concrete example, SecexPrevidência has already begun to carry out a systematic and automated control of social benefits in the areas of Social Services, Labor and Social Security such as the Family Grant, Continued Payment for the Elderly Benefits (BPC), retirement, pensions, federal aids, unemployment benefits, salary bonuses."

Secretary Fabio Barros, from SecexPrevidência, points out that the automatic control of social benefits - also known as Continuous Monitoring - represents the systematic and routine control of the granting and maintenance of benefits that currently represent approximately R$ 500 billion/year. Moreover, this new system allows the secretariat to define its control actions in a more selective way and also with a more error-risk based approach. It also helps prevent frauds and deficiencies in transactional systems and internal controls.

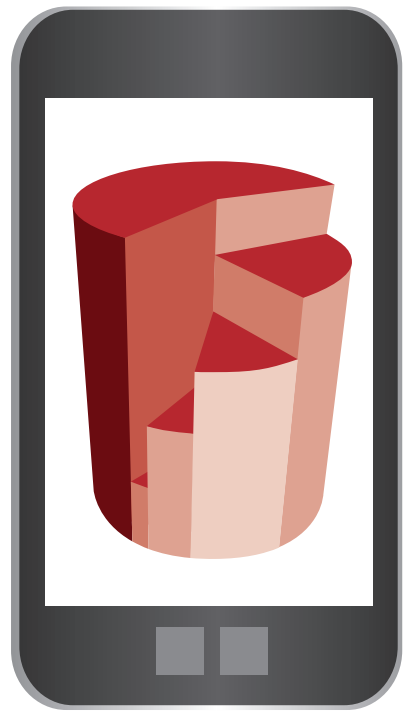
Encouraging the use of such technologies and methods is part of a strategy that seeks to spread such skills among all technical units of the court, so they are no longer restricted to a small group of civil servants.

"This is not about a need to change institutional structure nor the skills of the technical units. What matters is that TCU auditors have access to user-friendly technologies so they are able to, use new methods, techniques and tools in their daily work, each according to their own abilities," states Wesley Vaz, Head of TCU's Department of Information Management for External Control (Seginf). According to him, the purpose is to use the technological tools available to better solve the problems, be they related to the planning of a technical unit, to obtaining inputs to inform cases or the planning and execution of audits.

Seginf supports the technical units in a number of projects that demand intensive data analysis. Among its duties, it is in charge of answering questions about information available for auditor review, as well as the search for new tools related to data analysis and the training programs for each department. "In addition, we have helped the technical units identify auditors who have the abilities and interest in developing data analysis with the use of technology, so that, within the work of the departments, auditors are able to have the information and technical tools that help their tasks", says Vaz.

The use of large sets of information and technology to improve efficiency in external control is not something new at TCU. However, according to the Head of Seginf, "the growing complexity of the problems of public administration coupled with the growing use of technology and the increasing volume of digital information creates a challenge for the court. We must be prepared to face it. Therefore, it is necessary to train constantly our auditors so they can exercise their duties as best as possible. This guideline has been adopted, for example, by encouraging training programs in financial, public works and data audit, etc. Furthermore, I believe that the more complex the challenge of control, the more appropriate it will be to face it with multidisciplinary teams (experts or not in the use of Analytics) will become, comprising a group of professionals, each with their own talent, that can work in effective collaboration towards better results for external control. In this sense, it is clear that it is not necessary that all auditors have such knowledge. The important thing is that there are enough civil servants using these tools, so they can produce useful and appropriate information for the work that they aim to develop."

In the same context, the Center for Research and Innovation (Cepi) of the Serzedello Corrêa Institute (ISC) also plays an important role.



Cepi offers training programs for civil servants so they can become experts in the subject. It also enters into partnerships with universities and negotiates cooperation agreements. "We believe that the court's staff that when a TCU team does field work after having analyzed the data base of a future audit, they will act with greater insight and better defined targets, thus providing improved results," argues Fabiana Ruas, director of the center. She says a community of practices was created in which civil servants can exchange information and, based on this, Cepi can find new talents and professionals interested in the topic. The idea is that auditors that who do not work at either Seginf or Cepi, but who know the subject, can assist colleagues in other departments. "We believe that the best way to disseminate the data analysis culture is not by centralizing its demands, but allowing everyone to collaborate and help one another, making access to technology more democratic, so the Court will become more and more intelligent ", emphasizes the director.

TCU, as well as other Supreme Audit Institutions, have made it one of its priorities to invest in the training of its team to foster data analysis in their oversight work. In addition to offering courses since the beginning of 2015, Cepi also launched the Data Analysis Training Program, which includes a series of educational initiatives to address the gaps concerning skills. Our goal is to make the courses inclusive and that they provide contact with data technology to those who have no experience in the area as well as to those who are specialists and will have the opportunity to improve their skills.

TCU encourages professional certification

For four years, the Federal Court of Accounts – Brazil (TCU) has encouraged the professional certification of its public officials by means of fee funding provided through internal selective processes. Up to 2015, TCU has refunded the costs of 48 (forty-eight) officials who obtained professional certification. The areas covered in these certifications were auditing, information technology (IT) and project management, as well as processes management.

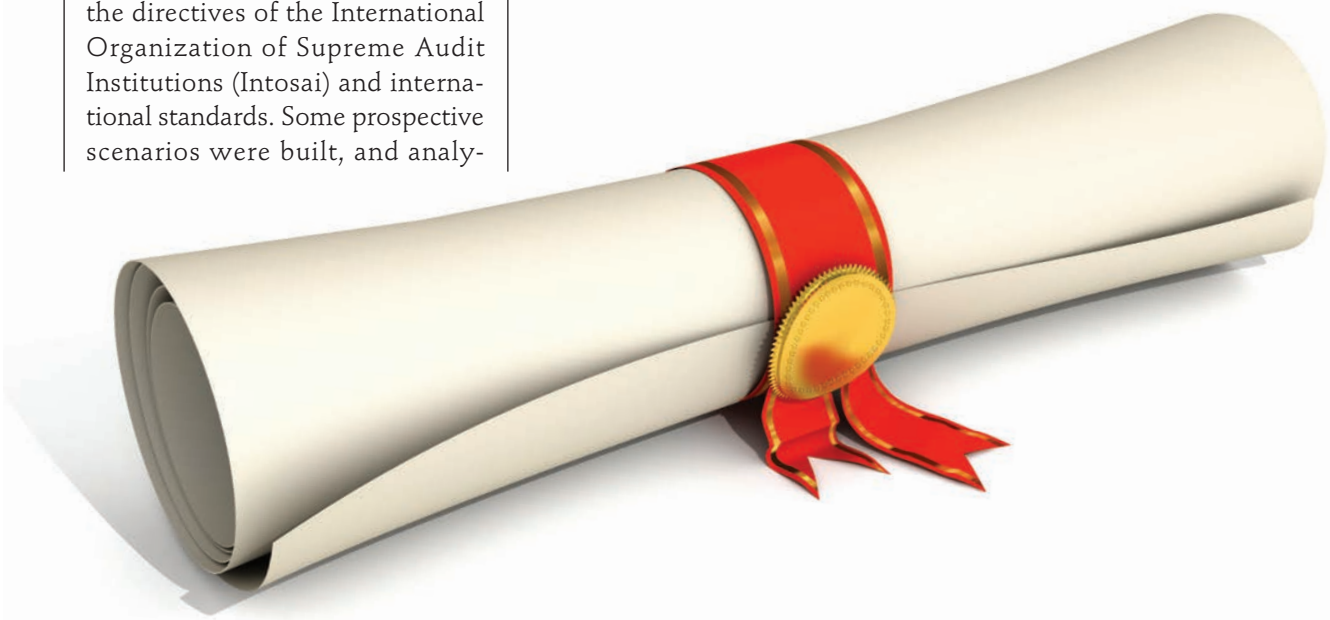
Since the creation of the incentives program, the average annual budget available to refund these costs was R$190,000. This refund is destined to cover 100% of the total amount spent on application for test taking or renewal of certification, study material and costs of a preparatory course, if any.

Currently, there is a project to promote actions to structure the Court as a certifier of audit professionals, acting in conformity with the directives of the International Organization of Supreme Audit Institutions (Intosai) and international standards. Some prospective scenarios were built, and analyses to be submitted to the TCU's General Coordination Commission (CCG) are being made.

The actions referring to this project are considered primary to TCU and are scheduled to be completed by December 2016. The project is under the responsibility of the Serzedello Corrêa Capacity Development Institute (ISC) in collaboration with the Department of Human Resources Management (Segep), the Department of Methods and Support for External Audit (Semec) and the Department of International Relations (Serint), and are also being coordinated by senior auditor André Jacintho dos Santos, of the ISC. The definition and validation of basic audit competences to be certified will be made building upon a competency model defined by Segep.

The certification topic is also highlighted in Intosai. To explore this matter, an international group was created, in recognition of the major importance and the necessity of professional development through certification, since there is not yet a certification that addresses the specific needs of public sector auditing.

This work group defends a few fundamental principles to be followed so that the certifications are aligned with the interests of the Supreme Audit Institutions. Some of these principles are that the certification should be based on International Standards of Supreme Audit Institutions; they should be inclusive; the model should mandate periodic maintenance and be consistent with an adaptable core. Other certification-related principles relate to the fact that the certification should provide for gradual learning, have a modular approach, create partnerships and be sustainable.



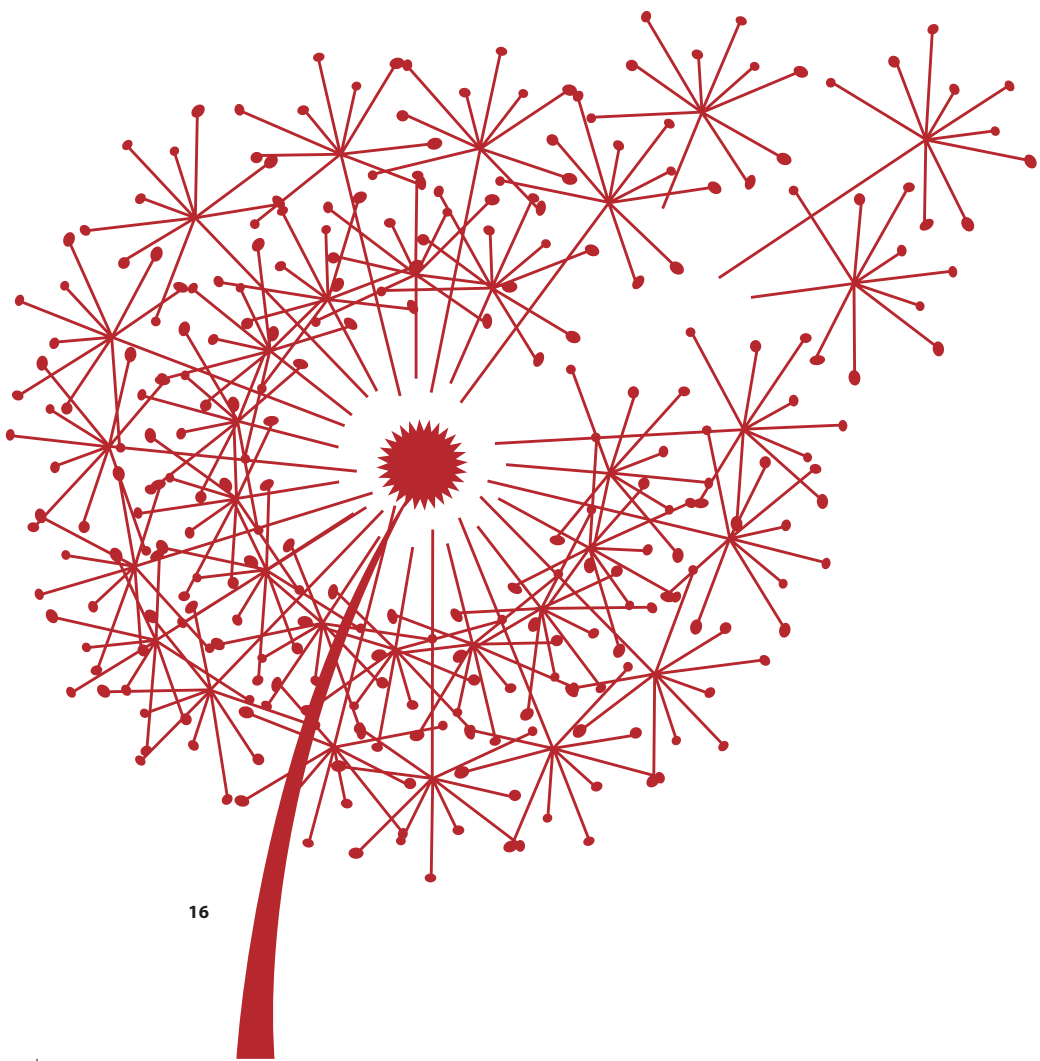
The TCU Innovation Program

TCU crates the Innovation Center (co**LAB**-*i*)

TCU Innovation Program (*InovaTCU)* was created to promote the development of innovation culture within the Federal Court of Accounts – Brazil, through encouragement, support and monitoring of innovative initiatives and practices. Following the TCU guideline of promotion of innovation, this February the Serzedello Corrêa Institute inaugurated the Research and Innovation Center (CePI).

The purpose of the CePI is to promote applied research in the Court and coordinate the coLAB-I, which is the first government innovation laboratory in an oversight agency. From its creation, coLAB-i has been supporting units of the Court in the development of innovative projects, ensuring knowledge management of the developed solutions, coordinating cooperation actions and promoting capacity building activities and events on topics related to the frontiers of knowledge. CoLab-i established partnerships with universities and other public and private entities to gather knowledge and experiences that can accelerate the achievement of expected results.

Here are two agreements signed in July 2015:



COOPERATION AGREEMENT WITH IMPA

The Federal Court of Accounts – Brazil (TCU) and the National Institute of Pure and Applied Mathematics (Impa) signed a cooperation agreement. According to the president of TCU, Minister Aroldo Cedraz, the objective of the partnership is to exchange experiences, information and technologies, to promote capacity building, improvement and technical specialization of human resources. Another part of the agreement is institutional development and public management, through the implementation of joint actions or mutual support and through complementary activities that are of common interest. Impa is an institution that can also deliver services for the improvement and evolution of institutions.

"The proposal aims at bringing together the institutions in the development of methodologies capable of optimizing the audit process", states

César Camacho, director of Impa, "a fundamental factor to meet present and future demands". Impa is a teaching and research unit qualified as a social organization within the scope of the Ministry of Science, Technology and Information - MCTI. For the incumbent Minister, Aldo Rebelo, who also participated in the signing of the agreement, cooperation is a form of finding in mathematics a utility beyond those already known. The president of TCU highlighted that the agreement will contribute to provide tools for the technical staff of the Court and capacity building in methods and technologies that will bring effectiveness to their work. It is possible to use the technology in several areas: government procurement, budgetary and financial execution of public expenditure, among others.

PARTNERSHIP WITH THE CATHOLIC UNIVERSITY OF BRASÍLIA

This partnership aims to develop applications that encourage the use of open data to favor transparency in public management. The University will offer its expertise in the development of applications and the Court will make open data available. For President Aroldo Cedraz, this cooperation is a simple act but one of great significance. "Establishing partnerships to support research and development of techniques that aim to improve public management is one of the main objectives of the Court", he stated.

TCU has been expanding the search for partners to implement several initiatives that will enable it to offer new services and improve those that already exist. Always attempting to build a government platform with the potential to shift the paradigm regarding the relationship between public administration and society. The applications and other technological elements developed can translate the data in products that are of interest and utility for the population. With this initiative, pioneer in government oversight institutions in the world, the Court also intends to be an example so Public Administration can find in innovation the means necessary to reach higher levels of efficiency and quality when delivering services to Brazilian society.

President Aroldo Cedraz opens the Innovation Center (coLAB-*i*)

From invention to innovation

TCU welcomes visitors in the exhibit Leonardo da Vinci: the nature of invention

The exhibit *Leonardo Da Vinci: the nature of invention* opened on July 21, at the headquarters of the Federal Court of Accounts (TCU), in Brasília, and it was visited by over 26 thousand people. Of this total, nearly 19 thousand were students from the Federal District and its surrounding areas. Students from public and private schools participated in guided tours organized by the educational program of the exhibition, which gathered 40 objects conceived according to the drafts and drawings left by the Italian artist and inventor who lived from 1452-1519. The pieces were produced in 1952, to celebrate the fifth centenary of birth of Da Vinci. The set of projects and models is part of the *Museo Nazionale della Scienza e della Tecnologia Leonardo Da Vinci*, of Milan, in Italy.

At the exhibition, it was possible to see, for example, reproductions of flying machines (Da Vinci was an aviation pioneer and created pieces based on studies of bird anatomy), a vehicle similar to war tanks, studies on submarines, human anatomy, and set design projects. In addition, the exhibit had reproductions of the equipment designed by the inventor to enable underwater breathing (an ancestor of the wetsuit). Most of Da Vinci's inventions were never executed. Others were essential for labor during his lifetime, such as the 4.5-meter high and 500 kg crane designed for the construction of the dome of the Santa Maria del Fiori Cathedral (Florence, Italy). It was the crane that made it possible to build the Cathedral's imposing cooper sphere, over one hundred meters high.

The president of TCU, minister Aroldo Cedraz stressed the opportunity of bringing the works to the Court and highlighted the importance of Da Vinci's work for society. Not only as an artist but also as an engineer and scholar. "The innova-

tive spirit of Leonardo Da Vinci inspired the world and has inspired actions in the Federal Court of Accounts. Innovation has been the word of the moment, a real trademark of TCU", he said at the opening of the exhibition.

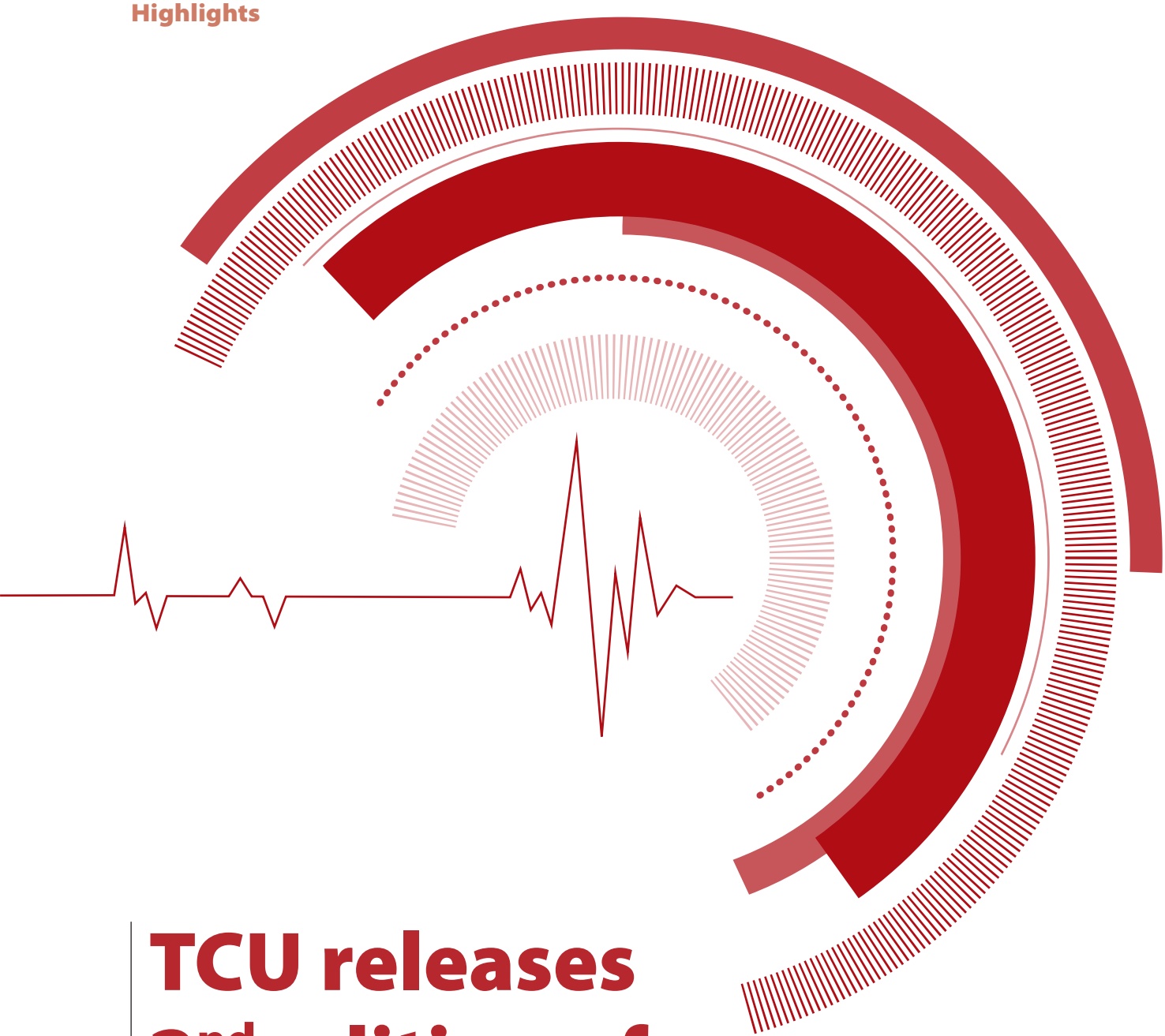
The governor of the Federal District, Rodrigo Rollemberg, described the opportunity as unique for students and for the population in general. "The possibility of our students, our youth and children, sharing such works is of great importance to build a culture of access to knowledge."

Several personalities visited the exhibition, among them minister Gilmar Mendes, from the Federal Supreme Court, the Ambassador of Italy in Brazil, Raffaele Trombetta, and the governor of the State of Goiás, Marconi Perillo. Still within the exhibition program, on September 24, Lúcia Helena Galvão, from the Nova Acrópole organization, gave a lecture "Leonardo da Vinci, a genius in search of life's secrets."

The exhibition was brought to Brazil by Industrial Social Service of São Paulo (Sesi-SP), Federation of Industries of the State of São Paulo (Fiesp) and the *Universcience* (a French organization created from the fusion of the *Cité des Sciences et l'Industrie* and the *Palais de la Découverte*, in Paris) and came to Brasília through a partnership between Fiesp and TCU. In TCU, the Cultural Management Service was in charge of producing the exhibition, which has already been in Paris, Munich, and São Paulo. From Brasília, the exhibition will go to London.

Thanks to the exhibition "The Nature of Invention", visitors had the opportunity to learn more about the creative genius that was Da Vinci, capable, as few, of integrating knowledge in areas as diverse as arts, biology and engineering, to produce scientific studies and inventions much ahead of his time.

Thus, in addition to providing access for the population of the Federal District and its surrounding areas to the works by Leonardo and to TCU, this exhibition allowed employees of the Court to be inspired by Da Vinci's genial creations and to understand and apply the "nature of innovation" as a tool to continually improve the activities that are the responsibility of the TCU.



TCU releases 2nd edition of "Guidance for Health Counselors" booklet

The Federal Court of Accounts (TCU) released the 2nd version of the "Guidance for Health Counselors" booklet. With such publication, TCU seeks to enhance the scope of the guidelines, which have been widely used as a manual, to strengthen the training of counselors, so that such agents are able to develop the perspective of all parties involved as to the role that they may have in formulating public health policies.

BACKGROUND

Audit works conducted by the court to verify the daily work of health counselors concerning their knowledge and duties intrinsic to their mission, in accordance with Act no. 8,142/1990 and Resolution no. 333/2003, in force at the time, showed that, despite the time elapsed from enactment of such rules, the low level of qualification of such government agents, combined with the population unawareness of their power to change health policies, constituted a compelling reason for concern.

In order to assist Health Council members in the proper exercise of their duties, TCU released, in 2010, the first edition of the "Guidance for Health Counselors" booklet, of a pedagogical nature.

With the enactment of Decree no. 7,508/2011, Supplementary Act no. 141/2012, and Resolution no. 453/2012, it is necessary to update the publication to adapt it to the new normative scenario. Such legislative framework resulted in changes to the work of health counselors, considering that, in addition to creating new rules for the operation of the Unified Health System (SUS), the legislative framework also expanded the duties of such agents.

TCU PUBLICATION ENCOURAGES GOVERNMENT ORGANIZATIONS TO START DATA OPENING PROCESS

The Federal Court of Accounts (TCU) believes it is essential for public managers to be sensitive to the need for providing society with full access to government information, not only because it is determined by the Brazilian laws, but also to allow citizens, companies, teaching and research institutions, non-governmental organizations and the government itself to fully enjoy the potential offered by open data. The purpose of the publication "Five reasons for data opening in the Federal Government" is to further the creation of such culture in the Brazilian Public Administration, which encourages government organizations to start a process for opening their data.

Aware of the benefits of open data to society, in 2014 TCU conducted an audit with the purpose of becoming acquainted with initiatives of the Federal Government for publishing such data.

Transparent government actions and active social participation are major instruments for promoting efficient public administration and for fighting corruption. Within this context, opening government data, by increasing the availability of complete and current information, promotes transparency and, at the same time, encourages people's participation.

To openly make public data available allows the access and processing of a great amount of information by means of information technology resources, which are nowadays widely used.

Accordingly, the citizens may actively take part in developing initiatives aimed at overseeing and improving the management of public resources. Furthermore, private initiative has been using such data to offer to society services of relevant public interest not usually rendered by the government.

Although Brazil has been adopting initiatives towards disclosing government data, such as the creation of the Brazilian Open Data Portal, there is still a long road ahead for the consolidation of an open data culture in Brazil.

Second edition cover of "Guidance for Health Counselors" booklet

Potential use of BIM in the oversight of public works

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ABSTRACT

Every year, the Federal Government spends billions of dollars on infrastructure. The external control body audits part of these public works and usually irregularities are found, mainly regarding basic design and poor monitoring. Thus, there is a need for technologies and processes to improve effectiveness in these areas. Improving the quality of projects using Building Information Modeling (BIM) technology has been reported in several studies, which has led to the adoption of this technology in multiple countries of the world. In Brazil, the use of BIM technology to audit public works is not completely clear. This paper studies the potential use of BIM in auditing public works through a comparative analysis between external control activities guided by the Public Federal Administration and the uses and academic findings on the benefits brought about by BIM. This technology has the potential to assist in the main external control activities through more qualified information to oversee and demand the fulfillment of the contracts, thus increasing the probability of performing better quality, more cost-effective and more time-efficient public works.

Keywords: Building information modeling; Public works; External control; 4D and 5D Modeling.

1. INTRODUCTION

In 2014, 54 billion reais were invested in the Federal Government's Growth Acceleration Program (PAC) (BRASIL, 2014b, p. 40). In the same year, the Federal Court of Accounts – Brazil (TCU) conducted 102 audits in public works to which 12.38 billion reais of the budget were allocated. Severe irregularities were detected in 56.9% of these projects, other types of irregularities were detected in 38.2%, and only 4.9% were entirely clear of problems. Most irregularities were detected in the following fields: execution of public works (41.2%), basic or executive project (34.3%), and oversight of the construction work (20.6%) (BRASIL, 2014e, p. 5, 16 e 24).

In view of this scenario, we need technologies and processes to assist the execution, design and oversight of public works in order to ensure better investment of public funds. In this regard, BIM technology has emerged as an innovative way to manage projects; it offers predictability and increases collaboration among project teams, thus making projects more cost-effective and time-effective, in addition to improving costumer-client relations (AZHAR et al., 2008, p. 445). This is made evident by the rapid emergence of different handbooks and users' guide written by various public agencies all over the world that aim at defining the requirements and the final products of BIM (SUCCAR, 2009, p. 358). One example of this phenomenon is the adoption of BIM in the United Kingdom, where the use of this technology in all public sector contracts celebrated will be mandatory as of 2016. The aim is to solve the issue of imprecise, incomplete and ambiguous information that results in unnecessary costs, which end up increasing the value of goods by 20% to 25% (THE BRITISH STANDARDS INSTITUTION, 2013, p. V).

As previously stated, the advantages of BIM technology in designing and conducting public works are evident. However, regarding public works oversight, there are not enough studies that prove the benefits of BIM. According to TCU audits, this particular field is where most irregularities are found. The Federal Public Administration must oversee the contract to check whether all its aspects are being complied with (BRASIL, 2014d, p. 43). In this context, this paper intends to demonstrate the potential of BIM in public works auditing. In view of the lack of theoretical references on the topic and the early stage of the use of BIM technology in the oversight of public works in Brazil, this paper is based on bibliographic review and establishes a parallel between oversight duties and the applicability and results of BIM. Therefore, it may be considered an entirely new study in Brazil.

2. BUILDING INFORMATION MODELING (BIM)

According to Eastman et al. (2014, p. 1), BIM technology is the construction of an accurate virtual

model of building; it contains relevant and necessary data to support the construction process and includes functions that are necessary for the lifecycle of a construction project. "When appropriately implemented, BIM enables a more integrated design and construction process that results in better quality facilities, as well as in reduction of costs and project delivery time" (EASTMAN et al.,2014, p. 1). The BIM model can be used for various purposes, such as: visualization and 3D rendering; design for fabrication; analysis of the legal requirements for the project; cost estimation; construction sequencing; interference detection; analysis of simulations and conflicts; and management and operation of constructions (AZHAR,2011, p. 242-243). The use of BIM brings benefits from the project design to the execution phase. This occurs because it enables a more precise visualization of the project, automatic corrections of changes made in the project, automatic generation of 2D drawings, compatibility between all project information, automatic extraction of quantities, synchronization with planning, better management and operation of constructions (EASTMAN et al., 2014, p. 16-21). These benefits were confirmed in a study by Bryde, Broquetas & Volm (2013, p. 974-976) based on the compilation of 35 case studies dated from 2008 to 2010, in several countries, in which the positive and negative effects of the use of BIM technology were mentioned. The results were grouped based on project management fields of knowledge contained in the Project Management Body of Knowledge (PMBOK), and the summary of the study is presented in Table 1 below:

BIM may be classified in 3D, 4D and 5D. BIM 3D refers to the virtual construction of the public work using 3D modeling computer tools in which it is possible to automatically generate 2D plans and connect various pieces of information in a centralized model. This makes it easier to maintain an updated set of documents, in addition to enabling its use in the analysis of interferences and conflicts among the various aspects of the construction project. This minimizes problems during execution as well as the need for project designers in the construction site. The visualization of the 3D model, virtual tours and countless possibilities of cuts and views increase the level of understanding of the project, and enable the identification of errors in the project's execution phase. BIM 4D links the 3D components to the tasks in the schedule; in other words, it already includes the time aspect. In turn, BIM 5D refers to the intelligent connection made by BIM 4D and cost-related information.

The data obtained from the case studies suggest that BIM is an efficient tool that enhances key aspects in the delivery of construction projects. Among all the success criteria created to analyze the case studies, cost was the aspect most positively influenced by the implementation of BIM. It was followed by time, communication, improved coordination and quality. There were relatively few negative impacts or challenges in the implementation of BIM, and most of them were related to software or hardware issues. These challenges refer to how changes for the adoption of BIM were managed and may be overcome through better training of employees involved and activities that aim at engaging stakeholders (BRYDE, BROQUETAS & VOLM, 2013, p. 978).

Table 1: Ranking of BIM success criteria

	Positive Effect			Negative Effect		
Success Criteria	**Total occurrences**	**Total number of projects**	**% of total of projects**	**Total occurrences**	**Total number of projects**	**% of total of projects**
Reduction of costs or control	29	21	60,0	2	2	5,7
Reduction of time or control	17	12	34,3	3	3	8,6
Communication improvement	15	3	37,1	0	0	0,0
Coordination improvement	14	12	34,3	3	3	8,6
Increase in quality or control	13	12	34,3	0	0	0,0
Reduction of negative risks	8	6	17,1	1	1	2,9
Clarification of scope	3	3	8,6	0	0	0,0
Organization improvement	2	2	5,7	2	2	5,7
Software issues	0	0	0,0	7	7	20,0

Source: Adapted from Bryde, Broquetas & Volm (2013)

3. THE USE OF BIM IN BRAZILIAN PUBLIC WORKS

The Federal Government, through the Brasil Maior plan, has established the following objectives in its strategic civil construction agenda: intensify the use of information technology applied to construction projects and implement the information classification system for construction – BIM standards (BRASIL, 2013, p.64). To attain this goal, the following measures are being taken: implement the library of civil construction components, making it available on the Internet so that everyone will have no-cost access to it; implement BIM technology in the Army construction projects system; and disseminate and complement the Brazilian set of standards for BIM (BRASIL, 2014a, p. 78).

As for the adoption of BIM in the Federal Public Administration, the Brazilian Army and Petrobras have been using BIM in some of its projects. In addition to these examples, in 2013 and 2014, the Banco do Brasil opened various bids for projects using BIM within the scope of the Programa Regional de Aviação [Regional Aviation Program].

In terms of standards and handbooks on BIM technology, only the State Government of Santa Catarina has published its guidelines in the "Caderno de Apresentação de Projeto BIM" [BIM Project Presentation Handbook]. "It defines the standards and formats that shall guide the development of projects using BIM in contracts with the State Government" (SANTA CATARINA, 2014).

4. EXTERNAL CONTROL OF PUBLIC CONSTRUCTION PROJECTS

Two laws govern the celebration of contracts for conducting public works in Brazil: the Lei de Licitações [Open Bids Law] and the Regime Diferenciado de Contratações públicas [Differentiated Regime for Public Contracts] (RDC). The Lei de Licitações is more comprehensive and establishes general rules on bids and contracts for the Three Branches of Government, States, Federal District and Municipalities (BRASIL, 1993, art. 1º). The RDC is more limited and used only in certain public works provided by law (BRASIL, 2011, art. 1st).

Art. 67 of the Lei de Licitações provides that the execution of the contract must be overseen by a representative of the Administration and allows the hiring of third parties to assist it and provide it with pertinent information on the task (BRASIL, 1993, art. 67). The RDC does not provide this, but it establishes in its Art. 39 that administration contracts must follow the norms established by Law nº 8,666 of June 21 of 1993, except for the specific rules defined by the Law itself (BRASIL, 2011, Art. 39). Therefore, the RDC also provides that the oversight of the contract execution process is mandatory.

As guidance for public works oversight, the Federal Government makes available on the Governmental Purchases webpage, the publication "Manual de Obras Públicas – Edificações –Práticas da SEAP – Construção" [Public Works Handbook – Buildings – SEAP Practices – Construction], written by the Secretaria de Estado da Administração e Patrimônio [Administration and Assets Secretariat] (SEAP) of the Ministry of Planning, Budget and Management (MPOG). The publication establishes general guidelines for oversight of public works (BRASIL, 1997, 10-2 to 11-2). The same document is also indicated as reference for oversight activities in the publication "Obras Públicas: Recomendações Básicas para a Contratação e Inspeção de Obras de Edificações Públicas" [Public works: Basic Recommendations for Public Buildings Construction Projects Contracts and Oversight] produced by TCU (BRASIL, 2014d, p.44).

5. DISCUSSION

Observing the activities described in the SEAP handbook, it is evident that they are very interconnected with project management. This fact suggests the benefits of the use of BIM as shown in Table 1. In the following sections, available references and research will guide an analysis on how BIM can assist audit activities described in the SEAP Handbook (BRASIL, 1997, p.10-2 a 11-2). The titles of the following sections refer to a summarized description of the activities contained in the SEAP Handbook and follow the same order found in the publication.

5.1 KEEP A COMPLETE AND UPDATED FILE CONTAINING ALL DOCUMENTS RELATED TO THE WORKS

One of the characteristics of BIM is the model developed in 3D, in which parametric rules are used and where generation of 2D plans is automatically extracted from views and section cuts of the model.

This significantly reduces the amount of time and the number of errors usually involved in the generation of drawings (EASTMAN et al., 2014, p.17). Another feature of BIM is the availability and connection of all pieces of information in one centralized model made accessible through links (KYMMELL, 2008, p. 49). For example, the specifications may be linked with libraries of objects in such a way that one specification is automatically applied when an object from the library is included in the project. It also offers IT applications for the selection and editing of specifications that are relevant to a given project and cross-references them with relevant model components (EASTMAN et al., 2014, p. 185). These features make it easier to update documents that compose the basic/executive project, mitigating inconsistencies among its various elements and, therefore, it helps the work of the construction inspector regarding the organization of the project's documentation.

5.2 ANALYZE AND APPROVE TEMPORARY FACILITIES AND CONSTRUCTION SITE PROJECT

Biotto, Formoso & Isatto (2015, p.87-88) observed the limitations of common planning techniques in terms of identifying space conflicts involving temporary facilities, inventories and equipment. These activities are related to BIM 4D modeling. In one of the case studies conducted by the authors, BIM 4D enabled the identification of several interferences between the execution of services and the fields of inventory, access and other elements of the construction site. In addition, BIM 4D assists with construction layout planning and anticipate future space-related problems involving the supply of the towers using a mobile crane, and even identifying obstructions to the equipment operator's visual field that would hamper its safe operation. To make these benefits possible, the scope of BIM modeling must be expanded to include transportation equipment, collective protection equipment, temporary facilities, among others (BIOTTO, FORMOSO & ISATTO, 2015, p.93). So, if the use of BIM 4D includes temporary facilities and construction site, the construction project inspector is able to do carry out a more accurate and better quality analysis of these elements.

5.3 ANALYZE AND APPROVE THE EXECUTION PLAN AND THE DETAILED SCHEDULE OF SERVICES AND PUBLIC WORKS

BIM 4D model allows testing different sequencing alternatives of the construction project, anticipating constructability issues in the planning phase (STAUB & FISCHER, 2006, p. 2-3) and increasing the probability of the project to be completed as planned and designed (FISCHER, HAYMAKER & LISTON, 2005, p. 30). To attain these benefits, the development of the BIM 4D model must consider the suitable level of detail for project items that must be communicated, the capacity to reorganize or create groups of the geometric entities, representation of temporary structures, decomposition of objects shown with single view line drawings, and inclusion of other schedule properties. It must also consider the start and finish dates (EASTMAM et al., 2014, 231-232). The most popular BIM tools do not have functions to respond to all the mentioned guidelines, but there are specialized 4D tools that produce 4D models based on 3D models and schedules that include such features. (EASTMAN et. al, 2014, p. 211 and 226-229). So, the use of BIM 4D models will offer a better visual communication of the schedules, increasing their feasibility and reliability, thus maximizing chances to finish the project in the established deadline, which will make oversight planning easier.

5.4 OBTAIN THE QUALITY MANUAL FROM THE CONTRACTOR AND CHECK WHETHER IT IS USED

Considering that demanding qualification in the Programa Brasileiro da Qualidade e Produtividade do Habitat [Brazilian Program on Habitat Quality and Productivity] (PBQP-H) to determine technical qualification has been repeatedly considered illegal by the TCU (BRASIL, 2014c, item 9.10.3), the bids for public construction projects at the federal level no longer require this certification. Therefore, checking whether the Quality Manual is being used does not apply.

5.5 PROMOTE MEETINGS ON THE DEVELOPMENT OF THE PROJECT AND TAKE NECESSARY MEASURES TO FULFILL THE CONTRACT

In this case, BIM is not used to promote the meeting, but to establish its agenda. One of the benefits of the 4D model is that is allows professionals to compare schedules and monitor the progress of the construction works. This enables professionals to identify if the project is on time or delayed (EASTMAN et al., 2014, p. 224). To offer these benefits, the model should provide a report on the phase of the project and on the construction of each component, aiming at monitoring and validating the progress of the project's components; however, no BIM tool meets this demand (EASTMAN et al., 2014, p. 210-211). These limitations are mitigated by using specialized 4D tools that enter information contained in the 3D model in more sophisticated schedule functions offered by the app itself, such as the software Sychro 4D or Vico Sofware, which allow professionals to compare the actual performance with the anticipated performance (EASTMAN et al., 2014, p. 222-229). Therefore, having more qualified information, the meetings on the control of the project's progress may attain their goal of monitoring and guiding the project to ensure their purposes will be fulfilled.

5.6 CLARIFY OR SOLVE INCOHERENCIES, FLAWS AND OMISSIONS IN THE PROJECT'S ELEMENTS, AS WELL AS PROVIDE NECESSARY INFORMATION AND INSTRUCTIONS FOR THE DEVELOPMENT OF PROJECTS.

BIM modeling "enables a better visualization of the project, and its development process allows the identification of interferences related to lack of or incoherence in information, when there is any." These geometric interferences and inconsistencies found based on BIM modeling are not found in the conventional process due to the limitations of two-dimensional representation (GOES, 2011, p. 132). Thus, the systems of all fields can be put together and compared; interfaces with multiple systems are easily verified; and conflicts are identified before they are seen in the building process (EASTMAN et al., 2014, p. 19). Therefore, the use of BIM minimizes the chance of errors and conflicts in the project, which will decrease the inspector's workload in this task.

5.7 SOLVE DOUBTS REGARDING THE SEQUENCE OF SERVICES AND INTERFERENCES AMONG WORK TEAMS

The previous sections addressed the benefits regarding communication regarding planning, sequencing of services, evaluation of constructability and logistics of the construction site brought about by the 4D model. This model helps the construction team to coordinate the work flow and the use of the space of the construction site. This gives contractors and subcontractors more productive and safe operations, which contribute to the obtention of more cost-effective and time-efficient construction projects (FISCHER, HAYMAKER and LISTON, 2005, p. 30). Therefore, the use of the BIM 4D model allows professionals to anticipate in the planning phase the problems that would surface during the construction process regarding sequencing and interferences among services, and, consequently, decrease the inspector's workload regarding these aspects.

5.8 PROMOTE THE PRESENCE OF PROJECT DESIGNERS IN THE CONSTRUCTION SITE TO CHECK WHETHER THE ACTUAL CONSTRUCTION FOLLOWS THE PARAMETERS, DEFINITIONS AND CONCEPTS OF THE PROJECT

The presence of project designers on the construction site aims to fill the gaps caused by the project's deficiencies. According to Azhar (2011, p. 243), the BIM model generation process inevitably discovers errors and inconsistencies as it is created, since it is a virtual building. Azhar also affirms that the features of BIM technology allow the creation of an improved project since it rigorously analyzes proposals; performs simulations; benchmarks performances; offers flexible documentation; and exploits automation. In view of the above-mentioned

benefits, projects designed using BIM tend to have better quality than those designed in 2D and anticipate issues that could exist during the construction process. Therefore, it decreases the need to have designers going to construction sites to solve doubts or adjust the design to the real conditions of execution.

5.9 STOP AND/OR REQUEST THAT "NON-COMPLYING" SERVICES BE REDONE

According to Eastman et. al. (2014, p. 235-236), the model of the construction may be used to verify whether the actual construction process reflect those shown in the model. As an example, he mentions the Letterman Digital Arts Center, in California, United States, a project that adopted traditional verification processes through daily rounds on the construction site and model reviews to identify possible errors. However, the qualitative verification of services conducted by the construction work inspector is still essential, and the use of BIM will make it easier to understand the project by means of virtual rounds, 3D models and countless possibilities of automatically generated section cuts and views.

5.10 REQUEST REPLACEMENT OF DEFECTIVE OR UNSUITABLE MATERIAL AND EQUIPMENT

This activity is similar to requesting that non-complying services be redone, and the same considerations presented previously apply here.

5.11 REQUEST THE PERFORMANCE OF TESTS TO CONTROL THE QUALITY OF SERVICES AND CONSTRUCTION WORKS

As mentioned about the organization of documents that make up the construction's basic/executive project, the BIM model can include the specifications of constructive elements and the necessary tests aiming at quality control. However, the inspector's critical sense and the role are essential to ensure an effective quality control.

5.12 HAVE RIGOROUS CONTROL OVER THE SCHEDULE, APPROVING OCCASIONAL ADJUSTMENTS

In previous sections, the following advantages of the 4D model were described: schedule simulations; identify interferences between the execution of services and the fields of inventory, access and other construction site elements; assist the construction project layout; possibility to test different sequencing alternatives, anticipating constructability issues in the design phase; increases the probability of the project to be completed as planned and designed. Therefore, the use of BIM 4D helps to control deadline and to make schedule adjustments, assisting the inspector in these activities.

5.13 APPROVE EXECUTED SERVICES, ATTEST MEASUREMENTS AND SUBMIT INVOICES FOR PAYMENT

By using BIM technology, it is possible to extract a list of quantities of elements from the model (EASTMAN et al., 2014, p. 18). The cost estimate of construction will be the product of the quantities obtained in the model and the cost of a database; this connection between the model and the database will vary depending on the software, allowing the cost of the construction project to be anticipated and controlled (KYMMELL, 2008, p. 58). Once the connection with the cost is established and the work progress is controlled in BIM model, the latter can be used to control cash flow. In addition, it is possible to control invoicing, tracing and representing the completed work in BIM so that the measurement quantities are removed from the model and invoiced accordingly, making it possible to visualize graphically the completed work for each measurement with the help of the model (KYMMELL, 2008, p. 113). It is worth highlighting that no BIM tool contains all the functions of an electronic spreadsheet or budget software (EASTMAN et al., 2014, p. 218). Some items contained in public construction projects budgeting are not part of BIM modeling – such as the local administration of the work, tests, executive project development etc. – and, therefore, they cannot be extracted from the model. Thus, their measurement must be carried through the conventional process. However, the use of BIM to extract the quantities of measured services is a substantial advantage that assists this oversight activity. because most quantities may be automatically extracted and, if it is connected with the progress of the construction project in the model, the completed and invoiced service may be visualized and this increases even more the benefits in terms of measurement control.

5.14 CHECK AND APPROVE THE REPLACEMENT OF MATERIAL, EQUIPMENT AND SERVICES

As said about the organization of documentation that is part of the basic/executive construction project, the BIM model can include the specifications of constructive elements and substitution alternatives; however, the activity depends directly on the inspector's activity to ensure that equivalence among components is maintained.

5.15 CHECK AND APPROVE PERIODICAL REPORTS ON THE EXECUTION OF SERVICES AND CONSTRUCTION WORKS

The advantages of the use of 4D and 5D BIM models to control and follow the deadlines and costs of construction projects have already been addressed in previous sections. The use of these models allows the visualization of completed services, cost analysis and phase of project in relation to what was planned. Therefore, the use of BIM makes it easier to verify the project execution reports.

5.16 REQUEST REPLACEMENT OF ANY CONTRACTOR EMPLOYEE

This is an administration activity in the field of human resources not related to BIM technology.

5.17 5.17 CHECK AND APPROVE PROJECT DRAWINGS "AS BUILT"

An up-to-date BIM model will correspond to the actual "built project" when the construction is completed. To achieve this, the model of the project phase must be adapted and continuously updated during the construction phase so that it will be an updated and precise reflection of the state of the construction project and, at the end, the project "as it is built" (KYMMELL, 2008, p. 75). Therefore, when BIM is adopted since the beginning of projects and the model is updated constantly, the project "as it is built" is automatically generated, which makes it easier for the inspector to check the drawings.

6. CONCLUSION

The oversight activities described in the "Public Works Manual – Buildings –SEAP Practices – Construction" (BRASIL, 1997, 10-2 a 11-2) – which is a reference for the oversight tasks conducted by the public federal authorities and by TCU – were analyzed in the light of the state of the art BIM technology to evaluate its potential use in this activity. In each activity, the main BIM contributions to public construction projects oversight were identified. Some of the aspects are below:

a. BIM 4D is able to identify the problems related to interferences among the various services and elements of the construction site already in the planning phase. Thus, it is possible to better plan the construction process and its construction site. This increases the chances of the project to be completed in the established deadline. By using specialized 4D tools, it is possible to compare what was planned and what was actually executed to evaluate compliance with the schedule and allow re-planning to ensure the project deadline.

b. adoption of the BIM 5D model offers the exact quantities of building components related to cost, which allows professionals to control cash flow and invoicing during the project, in addition to enabling the graphical visualization of the

finished work, which makes it easier to monitor the project.

c. c)some oversight activities – identification of defective service and material, request for tests, substitution of employees – cannot be assisted by BIM technology, because these activities must be done on the construction site and depend on the inspector's activity.

As a new approach in the construction field, BIM still has limitations; however, its use in all phases, from the design to the execution of the project, will make the inspector's task easier, offering inspectors better quality information to control and demand from contractors the fulfillment of the contract. This will increase the probability to execute projects with better quality, complying with the established prices and deadline.

Based on this work, the suggestion is to conduct in-depth studies in the following areas: guidelines to create BIM models in public construction projects; analysis of BIM tools that are more suitable to monitor public construction projects; and case study of a public construction project using BIM technology in its design and monitoring.

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Fiscobras: work in progress

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ABSTRACT

This paper approaches the evolution of the oversight of public works performed by the Federal Court of Accounts – Brazil (TCU) since it systematized the Fiscobras, and highlights its social achievements. The methodology consisted of a qualitative biography review, which presented the application of expertise and procedures employed by Fiscobras to oversee works carried under public services concession contracts. Also, this paper describes the use of technological innovations to enhance the TCU's public works oversight, such as georeferenced data. In addition, from a vanguard perspective, it deals with citizen participation in the oversight process, according to the Mobile Crowd sensing concept.

Keywords: Fiscobras, concession contracts, georeferenced data, and mobile crowd sensing.

1. INTRODUCTION

Twenty years ago, based on the Brazilian Senate Temporary Committee's Report on unfinished works funded by the Union, the Federal Court of Accounts – Brazil (TCU) started to systematically and effectively oversee works as part of the implementation of the Fiscobras. Today, it is not necessary to emphasize the relevance of public works oversight nor to pay tribute to those who achieved results in this field. The merit of the work and effort of professionals in this field is widely known in Brazil and abroad.

Souza and Batista's study (2015) illustrated the importance of oversight. They showed that the audits performed by Fiscobras between 2011 and 2012 in the state of Rio Grande do Norte saved public coffers around R$ 119,529,497.78.

Therefore, we must recognize the importance of a product that will always be unfinished, in face of the dynamics of public administration, and maintain the Fiscobras based on the same principles that underpinned its creation.

Considering the dynamics of TCU's oversight and aiming to contribute to the evolution of such work, we will present challenges for the near future: introducing Fiscobras in public services concessions by applying expertise and procedures often employed in public works oversights using information technology resources, such as georeferenced data; and including citizens' participation through Mobile Crowd sensing.

2. BACKGROUND

The plenary decision 674/1995 of the Court of Accounts originated a new form of performance, which was legally conceived and dedicated to the principle of isonomy. The High Chamber, who wished to see a protagonist to conduct an ongoing program to

audit engineering works and services, found that TCU was dedicated to the audit of stalled priority investments. After teams or specialized units were formed, the TCU tested its technical procedures, which were so strict they could be applied to other fields. At this point, utopian perspectives became true.

The first provision directly related to TCU's public works oversight was clause VI, Paragraph 3rd, article 3rd of Law n°. 9293, of July 15th, 1996 (LDO, 1997). However, it was vetoed.

In spite of this decision, Brazil's Constitution of 1988 allowed the TCU to audit public works on its own, and that is what the Court did.

The TCU sent to the National Congress reports with evidences of serious irregularities in the works audited. Then, the Congress published the first budget lock in the Annual Budget Law of 1997. This persistence financially benefited and improved Public Administration, and these changes were largely noticed by society.

Law no. 9473, of July 22nd, 1997 (LDO, 1998), determined that the TCU submit information related to the public works oversight to the National Congress. Since then, due to the successive budget guidelines laws, the Court has reported, every year, to Parliament the works with evidences of serious irregularities so that it can decide to block or release resources to works based on technical reports.

TCU's performance with Fiscobras collaborated so that the Public Administration could stop signing contracts with limited local surveys, in which prices were usually forged. Fiscobras invigorated and disseminated the official budgetary systems. Once the initial resistance ceased, everybody was convinced of the necessity to establish parameters of acceptable prices in contracts of engineering works and services. The use of technical parameters was a pacific issue in the precedents and it was maximized in public works contracts.

The extinct *Banco Nacional de Habitação* (National Housing Bank – BNH) implemented the *Sistema Nacional de Pesquisa de Custos e Índices da Construção Civil* (National System of Costs Survey and Indexes of Construction – Sinapi) in 1969. After Law no. 10524/2002 (LDO, 2003), this system became the legally mandatory parameter in public works built with resources from the Union's General Budget. Today, the Brazilian savings bank Caixa Econômica Federal manages the Sinapi based on a large database that allows the direct consultation of many types of services.

On the other hand, the *Sistema de Custos Rodoviários* (System of Road Costs – Sicro) is an evolution of the *Manuais de Custos Rodoviários* (Manuals of Road Costs), edited by the *Departamento Nacional de Estradas e Rodagens* (National Department of Roads – DNER) between 1972 and 1980. Today, this material is published by the Departamento Nacional de Infraestrutura de Transportes (National Department of Transport Infrastructure – DNIT).

These budgetary systems use theoretical modelling that are largely tested. Nevertheless, in some situations there is a need to adapt this modelling to actual field conditions. This is properly analyzed in TCU's oversight.

Auditors work every day to turn construction budgets into professional and transparent documents, and this process is very dynamic. Detailed budgets, acceptability criterion, ABC analysis, overpricing, manipulation of spreadsheets, etc. are examples of technical terms present in many debates at the TCU. In the near future, the debates will also mention other concepts: perfect, imperfect, or monopolistic competition market, risk-free rate, and elasticity, among others.

By issuing a law that required a detailed budget of the global cost of a work, based on the number of services and properly evaluated supply, the legislator seemed to foresee an accurate and controlled action of the Public Administration and a real world strongly influenced by TCU's precedents (BRASIL, 1993).

Today, emphasizing the relevance of public works oversight by TCU or the results achieved in this field is no longer necessary. Neither is it necessary to pay tribute to the ones responsible for this project. The merit of the work and effort of the professionals is widely known in Brazil and abroad.

3. CURRENT CHALLENGES

3.1 INCLUSION OF WORKS OF DENATIONALIZATION OVERSIGHT

To maintain the dynamics of TCU's public works oversight and its contribution to external control, it is important to always evaluate their reach considering the guiding principle of examining to what extent resources applied in public works obey the law. At this point, Fiscobras can contribute to the oversight of works included in public services concessions.

In the Brazilian law, the concept of public service is directly related to its social importance. Pietro (2015) defines public service as "every material activity legally attributed to the State to be performed directly or by delegates to concretely satisfy the collective needs in a totally or partially public legal regime."

Therefore, the public interest surrounding the public service is always present, even when a private company has to account for it, like in concessions and permissions. The State is entitled to provide the service, even if it delegates the work to a private company (PIETRO, 2015).

Article 175 of the Brazilian Constitution highlights that public services must be properly provided by the State or by means of concession or permission. Also, Law no. 8987/1995 considers that an adequate service should satisfy "the conditions of regularity, continuity, efficiency, safety, constant update, generality, courtesy in the provision, and moderate costs." (art. 6th, § 1st, Law no. 8987/1995). Law no. 8987/1995 also states that the Granting Power must "regulate the service conceded and permanently oversee it."

According to the regulations mentioned previously, overseeing a concession or a public work is very similar. In both cases, the quality of the work (constant update, efficiency, safety) and its expenses (moderate costs) are crucial issues. Also, Public Administration needs to permanently oversee the contracts and, consequently, perform external control.

Regarding the public interest, the major difference between a public work and a work by concession concerns the source of resources: in the former, society indirectly bears the expenses of the work (via budgetary resources); in the latter, society (users) directly defrays the work by paying a fee. However, this difference cannot change the public nature of the service, because the State is responsible for it. For example, users of a road operated by a concession must have their rights guaranteed like the user of a road managed by the Public Administration, regarding quality and obedience to technical and contract parameters. In a concession or in a public work, the State aims to fulfill a notably public purpose: the public constitutional right to use a determined infrastructure at adequate prices and with minimum quality, guaranteed by the State. Granting the service provision to a private company does not eliminate its public nature neither changes the legal assets – which must be protected – and the society's charge in case of deficient work. Thus, this situation demands the Court's oversight.

We will mention the case of roads as an example. A typical road concession contract has three stages: initial works, recovery, and maintenance. The concessionaire is supposed to perform a series of engineering interventions included in the fee. If the concessionaire fails to perform any of these stages, it can harm users, who pay for a service that they cannot use.

Thus, Fiscobras can be used in valuable concessions for Brazil by applying expertise and routine procedures in the oversight of public works. The only difference here is the focus, because the emphasis is not on the work budget, but on fulfilling the contract performance parameters. However, at some moments Fiscobras could analyze the costs of works in concessions, for example, when new investments are added to the original contract. When the external control directly contracts a concessionaire, it must require a detailed analysis of the engineering budget, because all costs will be transferred to the users via fee, without any competitive process (bidding) to mitigate budget excesses. For example, the new Programa de Investimentos em Logística (Logistics Investment Program) estimates to invest R$ 15.3 billion in current concessions to build works not expected in contracts, which users will have to pay for (2015).

Nowadays, Fiscobras is responsible for producing a report to the National Congress, which classifies works according to the level of irregularities found in the oversights to evaluate the forward of budget resources to enterprises.

However, this tool could be more dynamic and relevant if adapted to oversee concessions as well. Considering the increase in the number of concessions in Brazil and the peculiarities of a concession (focused on service rather than on the work itself), changing the concept of Fiscobras to include denationalized works can be very useful to society and even to the National Congress, because it can reduce costs and improve the oversight of adequate services.

3.2 TECHNOLOGICAL INNOVATION

Sharing information through technology is part of the modern society's reality. Many options can enable such communication, but the challenge is to organize what is being shared and use simple tools to properly employ information. The internet map server technology and the geographic information system (GIS) have a high number of users and present many types of applications and important products (NERY et al., 2015).

According to Branco (2014), since 1995 the TCU uses different forms of including information technology in their work processes with the aim of generating better information and knowledge to perform their institutional mission and obtain more satisfactory results for society.

The use of information technology, especially related to georeferenced data, is a reality in the Brazilian Public Administration. The *Instituto Nacional de Colonização e Reforma Agrária* (National Institute of Colonization and Agrarian Reform – Incra) requires that all rural properties in Brazil have their boundaries georeferenced so that every individual property has a specific location on Earth (BRASIL, 2013).

Furthermore, the *Instituto Brasileiro de Geografia e Estatística* (Brazilian Institute of Geography and Statistics – IBGE) established the *Rede Brasileira de Monitoramento Contínuo do Sistema GPS* (Brazilian Network for Continuous Monitoring of the GPS System – RBMC) in 1996, which covers the whole country. The IBGE aimed to construct a geodetic infrastructure using GPS-based modern techniques to serve as reference for locations so that users could easily access the system, and the quality of the results would be guaranteed.

Researches have shown the possibility of using georeferenced data in the construction of road infrastructure, such as the Infoambiente, a map server coupled to a file manager that provides documents, pictures, and geographic data layers online in a georeferenced environment. This tool helps monitor the actions of the environmental management in the roads of the state of Rio Grande do Sul, Brazil (PANAZZOLO et al., 2013).

The TCU has been using georeferenced data in its oversights. In a performance audit to diagnose the preservation units in the biome Amazonia, the Federal Court of Accounts created an *Índice de Implementação e de Gestão de Áreas Protegidas* (Index of Implementation and Management of Protected Areas – Indimapa), which is a georeferenced tool to evaluate, communicate, and monitor the Brazilian Amazon biome through a map. The index provides individualized data about the management of each preservation unit and consolidated information of evaluations performed by the TCU and the nine state court of accounts of the Amazon biome (BRASIL, 2013).

Another possibility to improve construction oversights is the use of remotely piloted aircrafts (RPA), popularly known as drones or unmanned aerial vehicles (UAV). Due to the technological evolution, the theoretical development substantially diversified the manufacturing of RPA models, which have been adapted to many types of civil and military activities. The use of RPA as an operational tool has a strong multiplying effect and provides all the benefits of a

multidimensional, integrated system. It eliminates the risk of human capital loss in missions, reduces the stress of the operator, and optimizes the operation management (RAMOS, 2014). Brazil has been introducing drones in some types of oversights (2015).

Therefore, the TCU must introduce georeferencing, satellite images, and even drones in public works oversights so that audits will be shorter and more precise, and their results will be more effective for society.

3.3 CITIZEN PARTICIPATION

Continuous technological progress provides citizens with new technologies to be daily used in the corporate environment or in the governmental environment. In the governmental environment, technologic tools must allow citizens to effectively participate in the decisions by expressing their opinions or even engaging themselves in the processes of formulation and oversight of public policies. In this manner, the government guarantees a legitimate political action (SILVA et al., 2013).

The idea of a web participation through new information technologies engages citizens in actions of public interest as a form of exercising their citizenship and using internet to serve society (OLIVEIRA, 2012).

The spread of technological applications generated a phenomenon known as mobile crowd sensing, a new paradigm based on the **power of the crowd** associated with the possibility of detecting various mobile devices, such as smartphones and portable devices.

According to Estellés and Gonzáles (2012), crowd sensing is a participative online activity in which an individual, an institution, a non-profit organization, or a company makes use of the capillary action of mobile devices to propose a voluntary task to a group of heterogeneous and different skilled subjects through an open, flexible call.

Ganti, Ye and Lei (2011) affirm that crowd sensing can contribute with infrastructural, environmental and social activities. These authors mentioned citizens' participation through mobile applications as an example of an infrastructure activity, for they provide information concerning traffic jams, road conditions, parking availability, interruption of public works (malfunctioning hydrants and broken traffic lights, for example), and real-time traffic monitoring.

Following this innovation trend, the TCU has used these tools to familiarize citizens with oversights and its results. The Court has recently released mobile applications that allow users to monitor the oversight of public resources. Also, Android and IOS devices can download applications to watch the TCU's plenary sessions, and access publications of jurisprudence and legal proceedings (2015).

One of the challenges now is to apply this system to public works oversight. Through mobile applications, users can participate as oversight agents. They can help the TCU select works to be overseen and provide information related to works in progress. This resource allows citizens to participate and familiarizes with the Court's works and help the TCU to accomplish its institutional mission. Besides, such application can mitigate the crisis of popular representation in public services.

4. FINAL REMARKS

Based on the successive budget guideline laws that determined forwarding of audit reports to the National Congress, the TCU developed a new posture in oversight – the Fiscobras –, which enhanced TCU's collaboration with the Public Administration and disseminated defined the official budgetary systems.

This paper presented an initial debate on the current challenges of this new model: introducing Fiscobras in public services concessions by applying expertise and procedures often employed in public works oversights; using information technology resources, such as georeferenced data; and including citizens' participation through mobile crowd sensing.

As the Fiscobras is constantly evolving, further studies on this matter may suggest improvements and new discussions.

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The use of geotechnology as a new tool for external control

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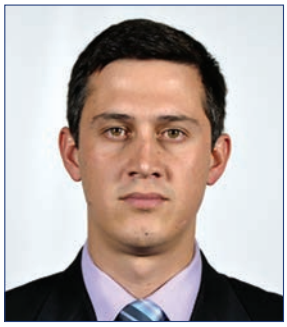

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SUMMARY

The goal of this study is to describe how the use of geotechnologies can become an innovative tool for external control, listing what are the main tools of geotechnology, enumerating the advantages of its implementation within the external control and describing a pilot project carried out in the Federal Court of Accounts of Brazil (TCU). Some important tools to support external control actions include the use of images from remote sensing (satellite, UAV and radars) with geoprocessing techniques, multi-criteria analysis applications for geographic information and Geografic Information System platforms (GIS) supporting all of these technologies. To check the efficiency of the multi-criteria analysis as an audit tool, a pilot test was carried out based on a model of a decision by multiple criteria coupled with geographic information systems directed to transportation planning. The study was conducted for the northern extension of the Norte Sul Railway – FNS, already scheduled, linking Açailândia/MA to the port in Barcarena/PA. The pilot results were very positive. The model proved to be simple and flexible. The results showed in graphics allow for an easy comparison view of the alternatives and of the most economical and efficient corridors. Furthermore, the model brings transparency regarding the data used, as well as adopted values and rules. The adoption of spatial multi-criteria analysis showed enormous potential for application in external control. The use of geotechnology tools has the ability to improve the performance of the external control, highlighting the increase of monitoring ability; expansion of the spatial and temporal scope of control; reducing travel costs; real-time monitoring of critical activities; increase the "feel" of control. Knowledge of geotechnology enables a more active external control by TCU, be it by increasing the tool proposition capacity to formulate public policies, be it by increasing the evaluation capacity of established public policies. In this sense, carrying out this pilot confirms the technical feasibility and the potential use of geotechnology multi-criteria analysis on these two dimensions. The next steps of this research include the evaluation of other geotechnologies and the evaluation of its incorporation as external control tools.

Keywords: geoprocessing, geointeligence, remote sensing, multi-criteria analysis, external control, audit of public works, evaluation of public policies.

1. INTRODUCTION

The implementation of a public policy (in particular those involving infrastructure projects) is usually complex and involves the analysis of a large amount of information from different fields: economic, social, legal, political-administrative and environ-

mental (Rodrigue et al, 2006 ; Nobrega et al, 2012). Decision-making without consideration and appropriate integration of these factors leads to poorly designed policies that do not optimize the aggregation of value to society. This complexity is also reflected in the performance of audit courts, especially given the need to act efficiently, timely and effectively in assessing public policies. This demands, especially in the infrastructure area, the incorporation of technological advances, among others, to the improvement of control measures (Pereira, 2009).

Some of the technologies available which enable an improvement in the development and evaluation of public policies are the geotechnologies supported by Geographic Information Systems (GIS). They enable the processing of large amounts of information and enable the integration of economic, social, environmental and technical data in a geographical and temporal context. From a practical point of view, it is new and still under development, so its use as a control tool is still on its early stage.

This article describes geospatial tools that are likely to be used in supporting the audits of the TCU and reports the innovative works that are being developed in the search for geoprocessing tools that might be useful for external control. It features an innovative pilot project carried out at TCU, using multiple criteria and GIS analysis for assessment of rail alignment alternatives. Finally, the paper discusses the potential application of geointeligence in external control.

2. GEOTECHNOLOGY TOOLS AND THEIR USE IN DECISION-MAKING

Geoprocessing is the discipline of knowledge which uses mathematical and computing techniques for the treatment of geographic information and that has been increasingly influencing the areas of mapping, analysis of natural resources, transport, communications, energy and urban planning. Geotechnologies are a set of technologies for collection, processing, analysis and availability of geo-referenced information. Several technologies are encompassed in this design and we describe here those which recently had greater application: Remote Sensing (RS), which include the use of images (satellite and manned/unmanned aircraft) as well as multi-criteria analysis applications for geographic information and GIS platforms supporting all these technologies.

Geographic Information Systems (GIS) are systems that connect geographic information to databases containing other types of information. These systems allow you to perform complex analysis to integrate data from various sources and create georeferenced databases. (Davis et al, 2001). The pooled data allow you to create thematic maps, in which various types of information can be overlaid and interpreted (Delgado, 2014).

Remote sensing is the set of techniques that allows one to obtain information on targets on the earth's surface (objects, areas, phenomena). Remote sensing is not limited to photos with satellites, but includes any equipment that can sustain a sensor such as a camera, a radar or even a laser measuring device. Thus, the sensors can capture visible light or any other frequency from the eletromagnetic spectrum and can be installed in the hand of a person, a building, a satellite, an airplane or in modern UAVs (Unmanned Aerial Vehicles), commonly known as drones. Of course, the relative position between the sensor and the object to be observed may vary, resulting in a multitude of perspectives, which would allow different applications of the obtained images.

The progress of aerospace, the miniaturization of sensors and the popularization of UAVs have made it possible to obtain better quality images and increasingly lower costs. This effect, combined with the large number of softwares like GoogleEarth, gave a huge boost to the popularity of images of the Earth's surface and allowed the application of remote sensing for a multitude of purposes. As important tools of remote sensing for external control exercised by TCU, we can mention satellite images, radar images and images taken by the UAVs, summarized in the following text.

2.1 SATELLITE IMAGES

The satellites currently available on the market today are able to provide images with an extremely high level of detail. The location accuracy and excellent geometric quality turn these products into instruments with various applications for external control actions. Also called orbital images, they are used when the area of interest is relatively large, which impairs the cost-benefit of the aerophotogrammetric flight or UAVs and also when you need images regularly. Satellite images are also attractive because of the wider range of spectral bands such as infrared images, which allows for identifying in an automated manner the

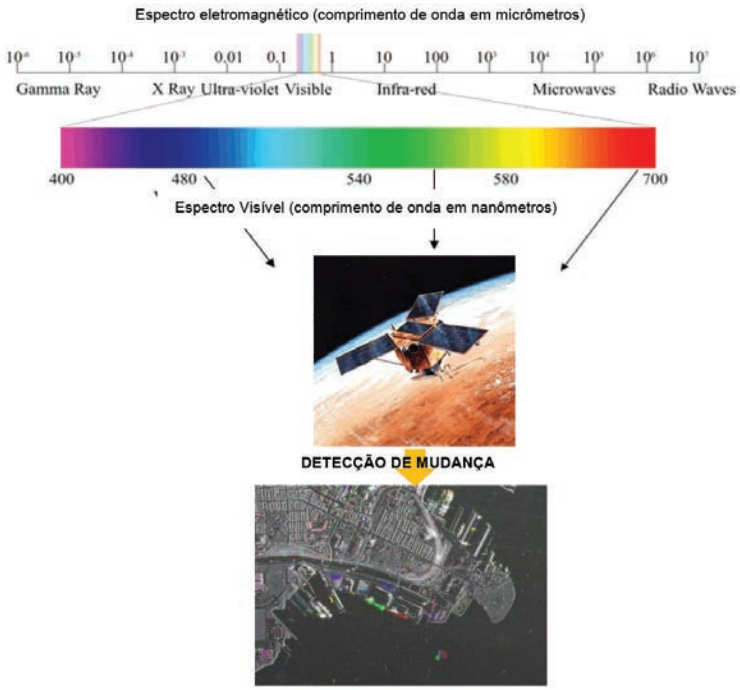


Figure 1:
Satellite Images and highlight changes in detection of colors

source: geo-airbusds.com

type of terrain or vegetation cover, for example. High resolution satellite images already compete in price and applications with photogrammetric aerial images, and are important sources of digital data for GIS in order to constitute a geographic database allowing the performance of variousanalysis.[1]

One of the products that offers many applications is the detection of changes, which is the recognition of changes in patterns characteristic of certain features at any given time. In practice, periodic images are used where the areas where there have been changes are "painted" or marked with different colors (Santos et al, 2005). The choice of data to be used in this process should list the type, the sequence of events so that they can support the control and the inspection of a particular region (Steininger 1996).

Under external control, the use of satellite images allows various actions ranging from the monitoring of areas or activities of interest (agriculture, construction, developments, settlements, areas of preservation and indigenous), which can be done through pictures updated daily, to data extraction contained in the images by means of specific software for interactive analysis activity and manipulation of raw images for subsequent interpretation, such as the creation of Digital Elevation Models and extraction of contour lines, from images.

2.2 PROFILING LASER IMAGES

Profiling laser images, known as LiDAR (light detection and ranging) revolutionized geotechnology

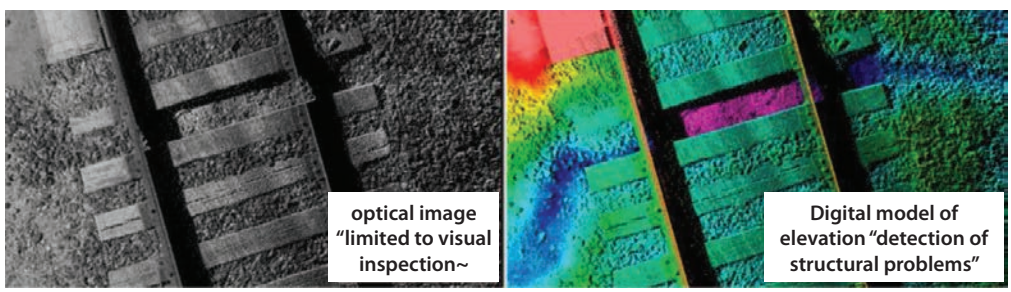


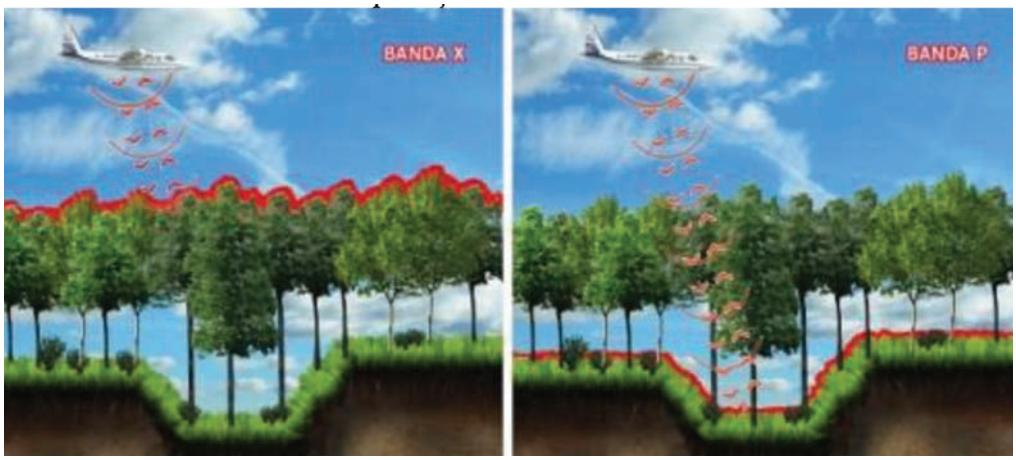
Figure 2:
Application of tillering images: comparison between the simple visual inspection through photographs and detection of problems in the track superstructure.

adapted from www.jasonamarori.com)

Figure 3:

Illustration of radar operation process highlighting the difference of the bands that allow the return signal on the surface of treetops or of the sign on the ground surface .

source: wwww.bradar.com.br



and are used as a way to collect data for the composition of topographic surfaces such as mining, cut and fill volumes, as well as three-dimensional measurement of objects installed on it, such as transmission lines and buildings. There are several companies of aerial photography in Brazil (with manned aircraft) that have such a system. Due to the quality, speed and accuracy in measurements, this system has gained more and more space in infrastructure projects and in monitoring.

The LiDAR is a sensor that emits pulses in the optical spectrum (usually laser) which, when they reach the surface to be mapped, are reflected, partly returning to the emission source. The system measures the time difference between the generation of the outgoing pulse and when it receives the reflected signal, and calculates the distance between the sensor and the surface. The pulse interaction with different targets on the surface causes lags in the signal, enabling the distinction and classification of different patterns on the surface.

2.3 IMAGES OF SYNTHETIC APERTURE RADAR (SAR)

The synthetic aperture radar (SAR) operate in the microwave range of the electromagnetic spectrum. Traditionally sensors operate in bands X (shorter wavelengths), L (intermediate waves) and P (longer wavelengths), these with the power to penetrate the vegetation cover, allowing the creation of digital terrain models with greater accuracy compared to traditional methods. The operative radar images in P band does not suffer interference or obstruction from the trees, which reduced considerably the margin of error in the execution of projects in which the highly accurate knowledge of the topography is very important, as in the precise study of flood area in a dam before construction.

SAR images are often used when: [1] the area of interest is constantly covered by clouds; [2] you need to precisely raise the altitude of a forest cover of the region; [3] it is required to map the region overnight; or [4]you need to monitor variations in the surface of the ground over time (Bradar, 2015). SAR sensors can be embedded in satellites or larger aircraft when it needs finer resolutions. There are commercially available orbital products with resolutions of tens of meters to a meter. It is noteworthy that the SAR images, by its natural non-optical signal and the required processing, display different characteristics than of an aerial photograph, and as such require unique methods of analysis and interpretation

2.4 UAV / DRONES

Unmanned aerial vehicles (UAV), also known as drones, are unmanned aircraft that can have autonomous control or be controlled remotely and manually. They are usually equipped with different systems such as cameras, sensors, communications equipment, among others. (Barrios et al, 2007). Currently, the use of UAVs is growing both in the military and in civil areas, especially when human operation is unnecessary, wasteful, repetitive or dangerous, especially in remote or small areas where the use of conventional photogrammetry makes work execution uneconomical.

The UAVs are being used in various fields of study such as archeology, geology, environmental monitoring and of accidents, monitoring of engineer-

Figure 4: UAV employment illustration for overflight on highways and the possible problems that technology can help identify before, during and after the execution of a project.

ing works for military purposes and aerophotogrammetric mapping. The systems allow, with moderate accuracy, the development of photogrammetric processes for correcting images and three-dimensional terrain measurement.

The UAV is an excellent tool for obtaining high-resolution images, low cost and high temporal resolution. These characteristics make it a quality alternative for the production of maps, Numerical Terrain Models (NTM) and high spatial resolution imaging.

Under the external control the UAVs have many applications, like the audits to follow linear jobs, such as railways, highways, canals and transmission lines. The use of UAV would allow the execution of aerial surveys, to the fullest extent of the job or at some particular point, with high resolution images and restitution of altimetry with point cloud generation of Digital Terrain Model (DTM) and contour lines , as illustrated in the following figure.

2.5 MULTICRITERIA ANALYSIS AND DEVELOPMENT OF PUBLIC POLICY

The objective of the evaluation of public policies is to help develop an eficient solution[2] that meets the goals of government action, considering possible alternatives for obtaining the desired results (HM Treasury, 2003). TCU has an important role, which is to charge public officials to make sure that public policies are adequately evaluated before its implementation, for the purpose of ensuring good use of funds. On the other hand, we must monitor and evaluate the

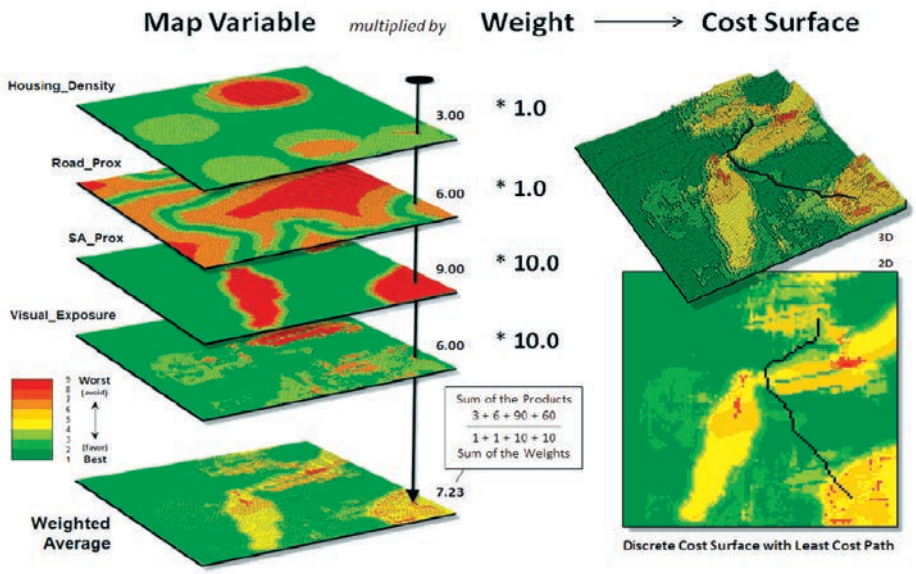


Figure 5: Multi-criteria analysis: maps integration process (Berry, 2009)

already implemented policies. The geospatial tools discussed here have great application in monitoring projects in progress or completed. In turn, the spatial multi-criteria analysis has application both prior appraisal (during the planning phase of a project) and in the evaluation after the policy is chosen.

One of the most used assessment tools for alternatives (and monitoring and evaluation of public policies) is the cost-benefit analysis. The basis of cost-benefit analysis is the monetization of costs and benefits. However, not always these costs and benefits can be easily monetized. In such cases, the multi-criteria analysis is an important tool to balance the benefits and costs of the impacts not monetized (London, 2009). It is a technique to aid decision-making about a complex issue, considering factors through weights, allowing them to choose alternatives according to different criteria and points of view. (Januzzi et al, 2009).

On the other hand, it turns out that, especially when it comes to infrastructure policies, environmental, agricultural or urban planning, much of the necessary information for decision-making are spatialized. With that comes the need to address the multi-criteria analysis in a spatial form - when it is used in combination with the geotechnology. The process allows a substantial reduction in analysis time, illustrates in the form of maps, graphs and tables, points out the areas of greatest viability (expected natural guideline for the implementation of infrastructure) and quantifies non-viable areas for the implementation of the work.

Therefore, the spatial multi-criteria analysis has great potential for the TCU, in areas such as evaluation of transport corridors, tracings of infrastructure works, great location for schools, daycares, hospitals and also in the monitoring of settlements, agricultural and of indigenous areas.

As it will be described below, a pilot work of space multi-criteria analysis has been conducted at the TCU, with the objective of evaluating the transport corridor linking Açailândia (extreme northern part of the Norte Sul railway) to the port of Barcarena (PA), seeking to ensure the best use of public resources.

3. THE PROJECT OF GEOTECHNOLOGY USE IN THE TCU

To be clear, there are numerous applications of geotechnology of which the control can benefit, especially:

- **Increased enforcement capacity:** the use of remote sensing imagery enables the automation of the inspection process, by providing a greater amount of systematized information in a smaller time frame, enabling broader evaluations of public policies or works;
- **Expansion of the spatial and temporal scope of external control:** with greater enforcement capacity becomes feasible to control a larger number of sites and at various times;
- **Reduction of travel costs:** the use of remote sensing is able to replace, in most cases, the auditor's visit to the place of inspection;
- **Real-time monitoring of critical activities:** certain activities that require more intensive monitoring by the control unit can be remotely managed in an efficient and timely manner;
- **Improvement of control planning:** the large amount of processed information that this technology enables, becomes a powerful source to plan the control actions;
- **Increase the "feel" of control:** with greater enforcement capacity and the expansion of the spatial and temporal coverage of the control agency's activities, the external control actions become efficient and timely resulting in a greater sense of control by the auditee;
- **Increased robustness and quality of public policy reviews:** with the use of spatial multi-criteria analysis, it is possible to evaluate and compare variables that are unquantifiable or that can not be monetized, allowing the control to evaluate more robust alternatives and choices of projects and policies, such as transport corridors, infrastructure works paths, location of schools, hospitals, and other public policies;
- **Transparency in the criteria used for the definition of policies or projects:** the provision of all data analyzed such as evaluation criteria and the choice of a project in a spatial database (GIS) (which can be combined or not to multi-criteria analysis tool) gives transparency to the adopted criteria and the relative weights used in decision making.

In this context, it emerged in the Coordination for Infrastructure Sector (COINFRA) of the Federal Court of Accounts of Brazil (TCU) a project to better assess the geospatial tools available in the market that are likely to be applied in external control and to formulate proposals for the structuring of technical units to incorporate the use of these tools . This work includes the completion of two pilots: the first, described below, which used the spatial multi-criteria analysis to assess the definition of a rail corridor. The second pilot, still in progress, evaluates the use of satellites and remote sensing images for the monitoring of public works. The work has the support of the Center for Research and Innovation of the Capacity Development Institute (ISC).

3.1 USE OF MULTICRITERIA PILOT ANALYSIS IN A RAILROAD

To check the efficiency of the multi-criteria analysis as an audit tool, a pilot test was conducted in partnership with prof. Rodrigo Nobrega, from the Department of Cartography of the Institute of Geosciences of the Federal University of Minas Gerais (UFMG), who developed a decision model for multiple criteria, supported by geographic information systems, targeted to transportation planning.

3.1.1 Study Area

The study was conducted for the planned northern extension of the Norte Sul Railway - FNS, linking Açailândia-MA to the port in Barcarena-PA. The port of Espadarte is also being planned in this same reagion, east of Barcarena. The knowledge generated and the results obtained can be used to analyze both the route to be proposed by the National Agency of Land Transport (ANTT) and Valec, and to assess the impacts of choosing one port or another. In order to maximize the capture of socioeconomic and environmental diversity, and infrastructure diversity of the region which could influence the railway project, the study area was expanded to 250 kilometers east and west of the straight line connecting Açailândia and Barcarena.

Figure 6: Scenarios, variables and their rankings used in level 1 of the multi-criteria decision-making implemented for TCU study of the northern stretch of the Norte Sul Railway

Nível 1

SOCIAL-ECONOMIC	
Criteria	*Ranking*
Population	6
Agricultural GDP	3
Industrial GDP	1
Services GDP	5
GDP *per Capita*	6

MARKET	
Criteria	*Ranking*
Soy	3
Other grains	4
Iron Ore	2
Calcite/Phosphate/Kaolin	3
Bauxite	1
Other types of Ore	4

LOGISTICS	
Criteria	*Ranking*
Roads – density	3
Waterway	8
Mineral deposit	2
Railway	1

ENVIRONMENTAL	
Criteria	*Ranking*
Official Native lands	9
Native lands – on-going study	7
CU – Full protection	7
CU – Sustainable use	5
Cave	9
Settlement – African origin	7
Settlement	7
Mangrove	5
Native forest	5
Archeologic site	9
RPPN	9

PHYSICAL GEOGRAPHY	
Criteria	*Ranking*
Hydrography – density	5
Hydrography – distance	5
Declivity	9
Geomorphology	3
Soft foundations	9
Transmission lines	5
Pipes	5

3.1.2 Methodology

The used model of multi-criteria analysis simultaneously integrated 35 different variables (such as terrain slope, agricultural and industrial gross domestic product, road density and intermodal attractiveness, intersection of waterways, environmental protection areas) combined into 5 groups (marketing variables , logistics, socio-economic, physical and environmental), as shown in Figure 7.

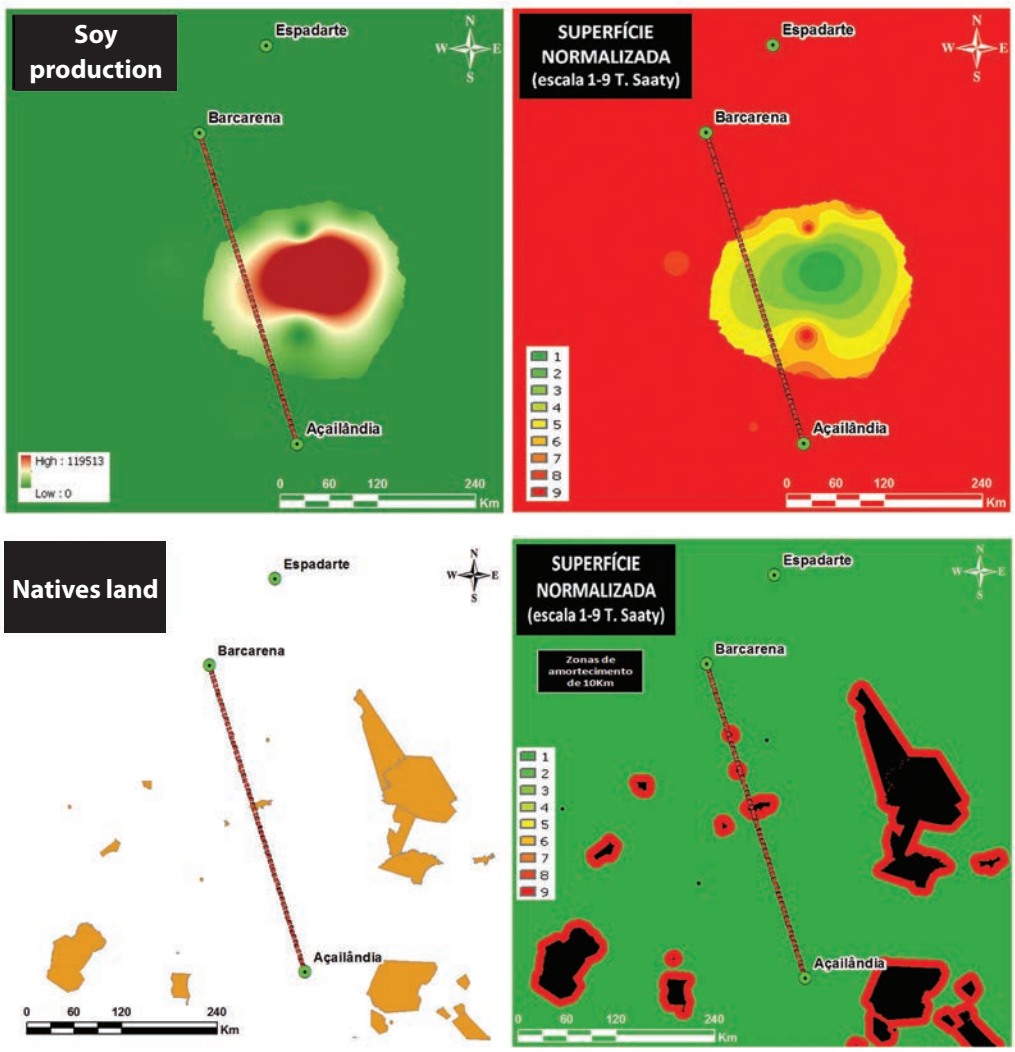
These variables were worked on a hierarchical procedure, where weights/points were given for each variable. The model defines whether these variables have attractiveness or repulsiveness to the railway line, as well as levels of attraction or repulsion. Thus, for example, stretches with steep slopes on the ground repel the route of the railway, as they result in a higher cost of construction, and points with high agricultural and industrial GDP attract the track as they may become points of interest for the construction of loading yards and freight. The adoption of weights was indirect and considered inputs in the range between 1 and 9, corresponding to the AHP model (SAATY, 1995). The strategy has always considered the degree of effort or potential cost offered for the railroad deployment for each variable. Lower values represent how attractive the model is (greater viability) and higher values represent repulsion (low feasibility or impossibility).

As a result, the model generates thematic maps (each variable is plotted on a map) and these maps are combined, following the example shown in Figure 5, in order to qualify and quantify the areas of highest feasibility for the implementation of the infrastructure.

The work was carried out in four steps: the gathering and processing of geographic data, pre-processing or adequacy of the data for entry into the mod-

Figure 7:

Examples of modeling of thematic maps used in the study of the rail segment between Açailândia-MA and Barcarena-PA



el, geographic modeling and finally the multi-criteria analysis for the creation of cost surfaces (or effort).

Data collection

At this stage we collected data that resulted in 35 distinct variables. These input data, without exception, come from public sources and were obtained without charge.

Preprocessing

In the preprocessing stage, the data listed above were prepared/modified to serve as input for the model. The first step was the geographical cut using the polygon of the study area. Some data, such as was the case with the digital elevation model, passed through the reverse process, forcing to compose a mosaic to fill the polygon. Once in line with the study area, the data were worked to generate thematic maps: the spatial mapping of information.

Geographic modeling

The geographical modeling of this study was based on the model proposed by Nobrega (2009). The procedure consists in handling information of each thematic map so that they can be processed and analyzed together.

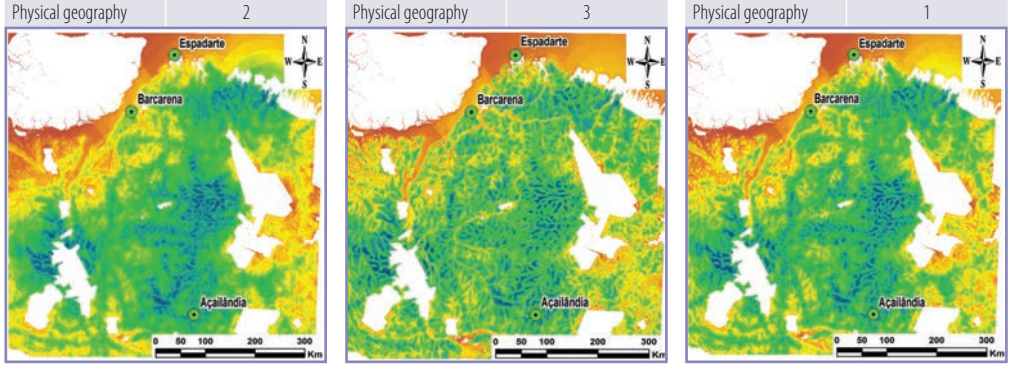
The initial challenge of modeling is the general understanding of the problem and how each thematic map entry will be treated to achieve the proposed objective. In this sense, the necessary steps are: [1][3] establishing rules for modeling (weights/points) each thematic map and [2] normalization of values.

In short, for the establishment of the rules, the data of each map are analyzed and processed as to contain qualitative data (nominal, categorical) and qualitative data (interval, ordinal), allowing them to be described in the same number and dimensionless scale so that they can be further processed together. This process can be developed in two ways:

Full scenario 1	
Criteria	ranking
Social-economic	2
Market	4
Logistics	2
Environmental	1
Physical geography	2

Full scenario 2	
Criteria	ranking
Social-economic	1
Market	1
Logistics	1
Environmental	2
Physical geography	3

Full scenario 3	
Criteria	ranking
Social-economic	1
Market	1
Logistics	1
Environmental	1
Physical geography	1



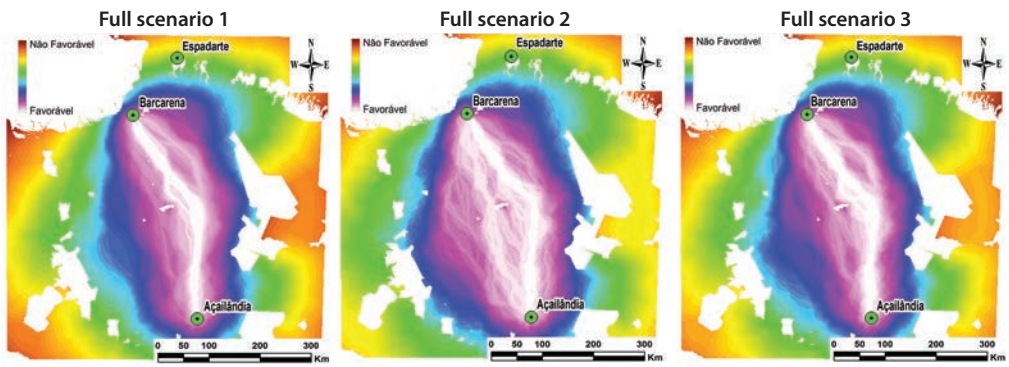


Figure 8:
viability of corridors linking Açailândia-MA and Barcarena-PA. White and pink areas represent greater viability to the railroad deployment.

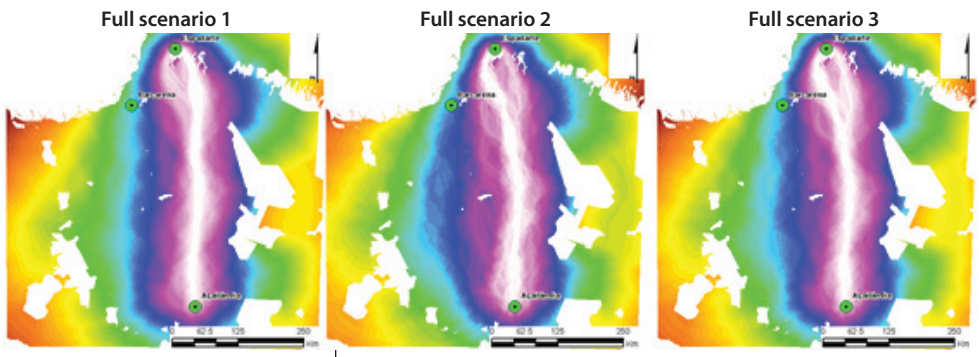


Figure 9:

Feasibility corridors linking Açailândia-MA and Porto Espadarte-PA. White and pink areas represent greater viability for railroad deployment

Processing of an interpolation surface, density map or indices (as slope maps): when using the mass center of the city and the farming attribute (eg, soybeans). The resulting surface will be divided into 9 classes as dimensionless production. The allocation of factors, called AHP - Analytic Hierarchy Process) will be inversely proportional to the value of production. The higher the production, the lower the AHP factor and respectively greater the attractiveness of the area for the corridor. The lower the production, the greater the AHP factor and greater stress to the operating corridor.

Definition of restricted areas: for example, the polygon of the indigenous area will be treated as restrictive mask. In this case, a 10Km buffer was created for the polygon and assigned the AHP factor = 9 for the area contained in the buffer. The rule prevents the occupation of indigenous areas, and hampers the occupation of the area surrounding the indigenous land.

3.1.3 Results

Once the five effort surfaces of the scenarios were established, these were integrated into the second level of the hierarchical process, for which it was established three integrated scenarios, which corresponds to the resolution of the sensitivity analyzes to model their corridors feasibility. Similarly to level 1, the hierarchical level 2 processing generated three new integrated level surfaces (Figure 8), used in their calculation of corridors (Figure 8 & 9).

Although different, the results of the three scenarios showed convergence in the passage/corridor to connect the two points. The areas identified as having the greatest viability for installation of the railway infrastructure suffered deviations caused by the repulsion of areas with environmental constraints. In its lower reaches, corridors showed great adherence for logistics, socioeconomic and marketing logistics to connect, in an almost straight line, the towns of Açailândia-MA and Paragominas-PA. The choice was also supported in maximizing geology and geomorphology, reducing the number of river crossings and of the intersection of high potential areas for soft soils.

Although the initial purpose of the work has been the use of a geographic intelligence model to calculate and represent alternative corridors for the Norte Sul railway between Açailândia-MA and Barcarena-PA, there was also a concern to include in the model the Espadarte Port, whose main appeal is the deep draft, compatible with the new traffic demand expected after the expansion of the Panama Canal. Figure 9 illustrates the model results including the Espadarte Port.

Similarly to the results illustrated in Figure 8, the convergence of the results in the lower half can be explained by the attraction of logistics, marketing, socioeconomic and physical variables. Overall, the behavior of the three corridors was very similar, except south of Espadarte Port, for which the model presented two corridor options in an attempt to minimize environmental impacts by intercepting mangrove areas and saturated soil.

3.2 MODEL ASSESSMENT

The pilot results were very positive. The model proved to be simple and flexible as it allows the rules to be molded dynamically, including the participation of performers and their opinions considered in weights for creating scenarios. The graphical results allow for an easy comparative view of the alternatives and corridors that best meet the established criteria. Furthermore, the model brings transparency regarding the data used as well as adopted values and rules. All information (quantitative and qualitative) are properly

registered in the system in the form of maps and tables, allowing a reproduction of the study.

The result of the corridor connecting the two points was consistent as expected. As there is still no trace design for this rail, the results of this multi-criteria analysis can be used in the future to assess proposals of layouts to be presented by the ANTT. When assessing the project, the model may also provide valuable information - with the view of several different scenarios - for the choice of location of the port.

The pilot work of spatial multi-criteria analysis has shown enormous potential for application in external control. The tool expands the way in which the analysis is currently done, when only geographical variables are considered. The tool allows evaluation of the choices of public policies as a whole, since it expands the number and type of variables considered and summarizes in a graphical result, unquantifiable variables or that can not be monetized. This tool enables the assessment of location (schools, kindergartens, hospitals and other enterprises) and optimal route for linear works (roads, railways, canals, transmission lines, etc.). With so much potential, there is the possibility of direct application in the areas of construction, education, environmental, health, among others. Moreover, there are many customizations that could be developed and especially the possibility of monetizing the variables and thematic maps, to generate financial surfaces to be compared.

4. CONCLUSION

One of the main responsibilities of the TCU is the evaluation of public policies, in order to bring benefits to the country and society. However, examination of public policies, particularly investment in infrastructure, is intricate and involves the integrated analysis of economic, spatial, environmental, social and technical data. This complexity demands innovation and the incorporation of technological advances. One of the tools available and that has great application in the performance of appraisals and monitoring of project implementation is the Geographic Information Systems (GIS) and geotechnology because they have the ability to process large amounts of information and allow its integration in a spatial context.

Several technologies are encompassed in this design, including the use of Remote Sensing (RS), which includes the use of images (satellite and manned/unmanned aircraft) as well as multi-criteria analysis applications for geographic information with GIS platforms supporting all these technologies.

To check the effectiveness of this instrument as a way to promote a more active and innovative external control, the Coordination for Infrastructure Sector (COINFRA) is developing a project to explore the systematic use of geotechnology in external control. For this, two pilot projects are underway in the railway area: one with use of multi-criteria analysis for railway track assessment and the second still in the initial phase which evaluates the use of satellite images, in addition to UAVs, to follow-up public works.

The first pilot was the application of spatial multi-criteria analysis for the evaluation of the best rail corridor to connect Açailândia/PA to Barcarena/PA. This prototype used a model that integrates the process of multi-criteria analysis with a geographic information system (GIS), allowing the ranking, prioritization, selection and refinement of preferred alternatives. The spatialized multi-criteria analysis is an important tool to weigh the benefits and costs of impacts including those that can not be easily monetized. To evaluate the best corridor/strip of the railway track, it was considered 35 variables, grouped into 5 groups (marketing, logistic, socio-economic, physical and environmental variables). The model defines whether these variables have attractiveness or repulsiveness to the railway line, and set the levels of attraction or repulsion. Variables were worked in a hierarchical process of multi-criteria analysis and point to a great strip where the railway should be located. The process allowed substantial reduction in analysis time, illustrated the results and solutions in the form of maps, graphs and tables, pointed out the areas of greatest viability (expected natural guideline for the implementation of infrastructure) as well as non-viable areas for implementation of the work. In addition, this tool increases the robustness and quality of public policy assessments - and gives transparency in the criteria used for the definition of public policies.

Geotechnologies have been established as an improving tool performance of the Brazilian Public Administration. Knowledge of geotechnology facilitates a more active external control by the TCU, either by increasing the tool proposition capacity to formulate public policies, either by increasing the evaluation capacity of established public policies. In this sense, the realization of this pilot confirms the technical feasibility and the potential use of geotechnology multi-criteria analysis on these two dimensions. The next

steps of this research include the evaluation of other geotechnology and evaluation of its incorporation as an external control tool, including in terms of structure to support the control departments in the use of geotechnology systematically, through training partnerships with specialized companies, training of auditors and even a possible creation of its own structure within the body.

NOTES

1 Images of the US Landsat satellite photograph the Earth's surface with spatial resolution of 30 meters and are available for free. In 2012, the Ministry of Environment (MMA), made available to federal agencies, images of the RapidEye satellites with a resolution of up to 5 meters. In 2015, the Ministry of Planning and Budget (MOP) conducted a record of price for the acquisition of satellite images from satellites Pleiades 1A / 1B and Spot 6/7, which provide images with resolution up to 0.7 meters. There are still images from other civil sensors with submetric resolutions, and that can be acquired from commercial representatives in a simple manner. Once acquired, the image becomes part of the project database and serves as spatial and temporal reference to supply analysis, eg measuring and monitoring the evolution of a project.

2 According to the TCU (in Performance Audit Manual Brasilia,. 2012, p. 12.): "Efficiency is defined as the ratio between the products (goods and services) generated by an activity and the costs of inputs used to produce them in a certain period of time, maintained the quality standards."

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Summary of the findings of the integrity assessment workshops with an emphasis on ethical aspects

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ABSTRACT

This article describes, in a summarized manner, the set of eleven findings from the integrity self-assessment workshops with an emphasis on ethical aspects, conducted by the Office of Internal Affairs of the Brazilian Court of Accounts in 2014 and 2015. For that purpose, the selection criteria used were the recurrence of findings (frequency) and the corresponding thematic relevance.

The article starts by describing the methodology used in the workshops (IntoSAINT). Next, the eleven findings are presented in an aggregated manner, in three categories: intrinsic vulnerabilities; factors that exacerbate these vulnerabilities; and measures of the integrity/ethics control system. Lastly, the main referrals and recommendations proposed as a result of the previously described findings are summarized.

Considering that integrity assessments of Supreme Audit Institutions with an emphasis on ethical aspects are rare; that topics such as integrity, ethics and transparency are gaining importance; and the belief that prevention and awareness are essential to preserve integrity/ethics within an organization, the article seeks to make practical contributions to the employees of the Brazilian Court of Accounts, since the findings described stem from their own observations and criticisms, which were discussed in the several workshops, with no intention of exhausting the subject or drawing absolute conclusions.

Keywords: IntoSAINT; Integrity assessment; Ethics; Vulnerabilities; Recommendations.

1. INTRODUCTION

Integrity assessments of Supreme Audit Institutions with an emphasis on ethical aspects have not been frequent in our country, despite the fact that topics such as integrity, ethics and transparency are becoming increasingly popular and gaining importance.

Based on these assumptions, the opportunity arose to conduct integrity/ethics self-assessment workshops in the Technical Units of the Brazilian Court of Accounts during 2014 and 2015.

This article starts by describing the methodology used in those workshops (IntoSAINT tool), in compliance with the guidelines of the Netherlands Court of Audit, the entity that created and developed the tool.

Next, the most frequent findings with the highest thematic relevance are presented in a summarized manner.

Finally, the article presents a summary table of the main recommendations to the Technical Units assessed and referrals to the relevant areas at the Court's headquarters (Brasília), with the primary aim of reducing the identified vulnerabilities and/or strengthening the controls deemed deficient.

2. INTOSAINT

2.1 CONCEPTS

The word integrity comes from the Latin in-tangere, which means untouchable. It is a broad concept related to incorruptibility and the state of remaining intact. It is closely related to the absence of fraud and corruption.

According to ISSAI 30 (Code of Ethics of INTOSAI), one of the main reference documents, integrity can be measured in terms of what is right and just. Values such as transparency, objectivity, independence, honesty and mainly **ethics** are commonly related to the concept of integrity.

IntoSAINT is an integrity assessment tool developed by the Netherlands Court of Audit and subsequently translated into Spanish and adapted by the Supreme Audit Institution of the Federation of Mexico (2012-2013), which is the main body responsible for disseminating it to the member countries of OLACEFS (Latin American and Caribbean Organization of Supreme Audit Institutions).

The tool's name is a contraction of the acronyms INTOSAI (International Organization of Supreme Audit Institutions) and SAINT (Integrity Self-Assessment). Therefore, it allows employees themselves, based on their perceptions, to identify vulnerabilities and assess the maturity level of the integrity control system of their audit institution.

2.2 METHODOLOGY

The IntoSAINT tool is applied in a two-day workshop conducted by two qualified moderators. Participants (maximum of 15) are jointly selected by

the moderators and directors among non-management employees.

Initially, participants must validate a preliminary list of the Technical Unit's key processes, in order to promote deletions, additions or modifications, as deemed appropriate by the group.

Discussion of the key processes is followed by three sessions in which forms are applied and each participant individually ranks the items presented, according to their perception. Each session is followed by the tabulation of scores and discussion of results.

In the first form, participants assess the Unit's intrinsic (or inherent) vulnerabilities. As a rule, processes or functions considered by participants as most vulnerable to integrity/ethics violations receive higher scores.

In the second form, participants assess factors or circumstances that exacerbate the vulnerabilities identified in the previous step, because of either their increased probability to occur or the impact they may cause. The higher the degree of exposure to these factors or circumstances is, the higher the score assigned by participants should be.

A key element of this methodology is to assess the maturity (or robustness) level of the integrity/ethics control system (ICS), which is a set of measures established to promote, monitor and ensure the integrity/ethics of the audit institution. The third form aims to assess the existence, implementation and effectiveness of related controls. The higher the robustness level of the system is, the higher the score assigned by participants should be.

The existence or nonexistence of balance is determined based on the comparison between the assessments of vulnerabilities and the ICS maturity level. In the absence of balance, gaps are assumed to exist, thus indicating that the control system should be strengthened and/or the remaining vulnerabilities minimized.

Based on the findings and conclusions of the gap analysis, participants, with the help of the moderators, prepare the recommendations to be proposed to the heads of the Technical Unit as well as referrals to the relevant areas at the Court's headquarters (Brasília).

Finally, the consolidated self-assessment report, including recommendations and referrals is presented to the senior officials, with the request that an interlocutor be appointed to draw up an action plan to be monitored (onsite and remotely) for a period of up to one year.

2.3 WORKSHOPS

Five workshops for application of the IntoSAINT tool were held at the Departments of External Control between March 2014 and July 2015 [AM, PI, PB (2014); MS and SE (2015)], which corresponds to almost 20% of all units based in the states.

Moderators were staff members of the Office of Internal Affairs of the Brazilian Court of Accounts (TCU). The number of participants ranged from seven to twelve non-management employees in the respective Units.

In addition to these, three of the workshops counted on the voluntary participation of some TCU employees who had shown interest in the theme to be addressed.

3. FINDINGS OF WORKSHOPS

Out of over 50 findings collected in the workshops, 11 were listed using recurrence and thematic relevance as selection criteria.

For didactic purposes, these findings were grouped according to their correlation to actions or activities which are considered **intrinsic vulnerabilities** (1st group) or **factors that exacerbate these**

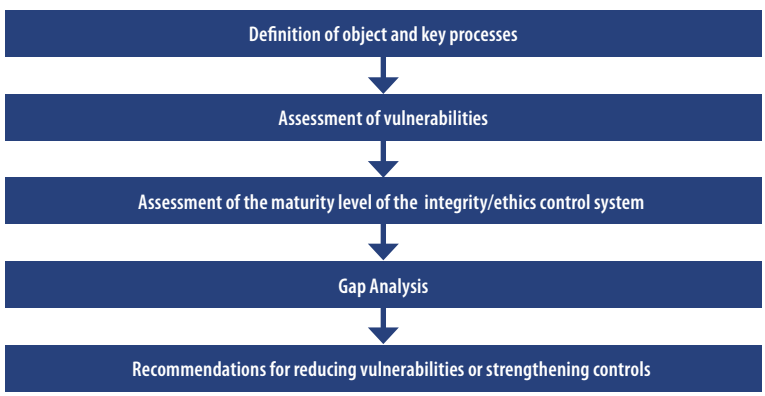

Figure 1:
Stages of the IntoSAINT workshop

Source: The authors

Figure 2:
Photo of IntoSAINT workshop participants

Source: The authors

vulnerabilities (2nd group) or, yet, with measures of the **integrity/ethics control system** (ICS) that the Technical Unit has or should have (3rd group).

3.1 INTRINSIC VULNERABILITIES

3.1.1 INSPECTION OR AUDIT

As a rule, TCU employees have more direct contact with respondents during inspection assignments than during the fact-finding phase, thus increasing the intensity of external relations. As a result, they feel more vulnerable to temptations to misconduct. It was also mentioned that, in the states, especially the smaller ones, many employees are acquainted with key officials (or entities) and their track record, a situation that is often unfavorable. Attention was drawn to possible prejudice (preconceived judgments) during the fact-finding phase or preparation of audit reports.

3.1.2 HUMAN RESOURCES MANAGEMENT

Also discussed was the need for special caution in hiring outsourced personnel and trainees, such as checking direct links (employment or position of trust) with the state or municipalities, and kinship with persons directly interested in judicial proceedings under the responsibility of the Unit, or yet any situations of risk to information security and confidentiality of documents and proceedings. Great concern was voiced with respect to IT support professionals, especially regarding the disclosure of passwords and/or access to corporate systems. Another concern affecting mainly medium and small departments is related to the significant number of outsourced personnel and trainees, which could put the unit in a situation of vulnerability, especially in the areas of asset and information security. In almost a third of all state secretariats, the overall number of outsourced personnel and trainees is estimated at being close to that of permanent employees.

3.1.3 MANAGEMENT OF PERSONAL PROPERTY AND INSPECTION OR AUDIT

It was also mentioned that although on the one hand the repeated participation of some employees in the same administrative activities or the designation of the same employees to the inspection of certain respondents leads to specialization or the accumulation of knowledge about the object of the inspection, on the other it can facilitate access to TCU employees by bidders, contractors, respondents and others who may be interested in encouraging said employees to deviate from integrity/ethical conduct.

3.1.4 BIDDING AND CONTRACTING

In an assertive manner and based on the grounds that the decentralization of these duties is a weak point in any institution - given the nature of these established rules - the employees pointed out their high degree of vulnerability and, therefore, their susceptibility to misconduct. A recent example mentioned was the bidding process for the purchase of office supplies in small quantities and at a low cost. There were no bidders in the process. Some Units have suggested that the process should be centralized (at the TCU headquarters in Brasília) to prevent local improvisations. It was argued that a nationwide contracting system would enable selecting the soundest companies, with offices

(branches) in every state and which, therefore, could be held accountable in case of problems in the performance of the contract. It is known, however, that headquarters claims that its structure is insufficient to meet these and other similar demands.

3.2 FACTORS THAT EXACERBATE VULNERABILITIES

3.2.1 REDUCED KNOWLEDGE SHARING

The low level of sharing of accumulated knowledge and recent assignments (ongoing or recently completed) observed in some Units resonates in an important fact: some do not know what others are doing and vice versa. This so-called "internal social control" would be deficient. According to the employees, this could lead to the isolation of some employees and consequently lead to temptation to misconduct. Hence the suggestion to promote technical meetings and gatherings as a way of sharing knowledge and assignments, which would also strengthen the team integration process.

3.2.2 REDUCED PROSPECTS FOR PROFESSIONAL GROWTH

In some Units there are few prospects for professional growth. There are significant wage differences between old and new employees, a situation that triggers an organizational climate that is not always favorable. There have been institutional attempts to minimize this distortion, such as by creating the senior specialist position (which implies a salary increase), but by all accounts the Units in the states have not been satisfactorily contemplated. It is also recalled that most employees who have reached the salary cap in their career have no prospects for professional growth, which is the main factor in the sometimes observed lack of motivation. This context could induce dissatisfied or unmotivated staff to become interested in activities external to the Court, which are not always advisable. It was concluded that under these conditions, misconduct (or even errors) are likely to occur. Part of the experienced employees asked for more opportunities to pass on (or share) with others the knowledge gained throughout their career.

3.2.3 BUREAUCRACY

Often the employees emphasized the formal aspects in actions taken by certain officials. Sometimes expressions such as "too much emphasis on bureaucratic aspects" were used. An example mentioned was the review of fact-findings or reports, due to their predominantly formal character, sometimes at the expense of content. According to some employees, there would be certain strictness with regard to details and minutiae related to formalities, which could, according to participants, serve as a disincentive to auditors and jeopardize the procedural progression of cases.

3.2.4 RELATIONSHIP NETWORKS

There were reports that some colleagues taught courses in the past and therefore did marketing within the TCU, as well as cases of employees who used to provide advice and consultancy to government agencies, which could be dangerous from the standpoint of integrity and ethics, given the possibility of inter-relationship with people interested in cases under the Unit's technical responsibility. The employees are unaware of current cases of this nature. However, it was suggested the need for the issue to be regulated in order to establish conduct codes and boundaries with respect to courses or lectures to be delivered, as well as to interrelations with respondents.

3.3 THE INTEGRTY/ETHICS CONTROL SYSTEM

3.3.1 AWARENESS ACTIONS ON THE TOPIC

Several employees recognized the lack of regular training courses that include the integrity/ethics topic on the Court's agenda. In the view of these people, this is a topic that can be prioritized, including in training courses for employees admitted through public entrance examinations. The participation of the TCU ethics council on the agenda of the courses was also suggested.

3.3.2 ATTITUDES OF THE UNIT'S HIGH MANAGEMENT

A low level of participation of employees (other than officials) in making decisions of collective interest was observed in some Units. An example mentioned was the discussion process for the annual plan of each Unit. A significant portion of the employees expressed the desire for more effective participation in order to bring greater transparency to management and legitimacy to the decisions.

3.3.3 EMPLOYEE RECOGNITION MECHANISMS

Although there was no consensus, the possible lack of mechanisms of institutional recognition of good performance was also one of the issues raised. According to some, the criteria are not yet very clear. At the institutional level, the suggestion was to expand the recognition mechanisms. Within the Technical Units, some suggested keeping praise given to employees in their files, giving out symbolic awards (recognition medals, buttons for the employee of the year) or other incentives, as appropriate. These initiatives, according to opinions, could help minimize the dissatisfaction or lack of motivation of some employees, as both are risk factors for possible professional misconduct.

3.4 RECOMMENDATIONS OR REFERRALS

In order to eliminate or minimize the weaknesses identified in the IntoSAINT workshops, participants submitted proposals to the Technical Unit assessed as well as referrals to areas of the Court's headquarters in Brasilia.

3.5 FINAL CONSIDERATIONS

IntoSAINT is a newly created diagnostic tool, which seeks to strengthen the integrity/ethics control system of audit institutions and minimize the influence of factors that exacerbate their inherent vulnerabilities, thus contributing to the gradual change of culture in these organizations, especially as regards the ethical values that guide the performance of their employees.

Because prevention and awareness are believed to be essential to preserve the integrity/ethics within an organization, this article seeks to make practical contributions to the employees of the Brazilian Court of Accounts (and other similar audit institutions), taking into account the fact that the findings described result from their own observations and criticisms.

For the same reasons, the findings should not be transported to the whole set of external control departments, though they may serve as a warning, including to management sectors where applicable.

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Table 1:
Recommendations and referrals

ACHADO	RECOMENDAÇÃO/ENCAMINHAMENTO
Item 3.1.1	To the competent area: Study the feasibility of including the topic of **Inter-relations with the Audited Party in Inspection Assignments** on the agenda of training courses for employees admitted through public entrance examinations.
Item 3.1.2	To the Technical Unit: Define the desired profile for trainees and outsourced personnel during recruitment (by the contracting company) in selection processes, in order to avoid hiring people with inadequate qualifications.
	To the Technical Unit: Draft and implement the confidentiality (commitment, behavior or similar) statement to be signed by outsourced employees and trainees hired for the Unit.
Item 3.1.3	To the Technical Unit: Define rotations of actions and activities among employees of the Administration Service (procurement, contract audits, etc.).
	To the Technical Unit: Promote the turnover of auditors in fact-finding procedures and especially in inspection assignments relating to the same respondent.
Item 3.1.4	To the competent area: Study the feasibility of centralizing some bidding procedures at headquarters in Brasilia.
Item 3.2.1	To the Technical Unit: Promote technical meetings and gatherings as strategies for sharing accumulated knowledge and recent assignments either in progress or completed, and strengthen the integration process.
Item 3.2.2	To the Technical Unit: Encourage the access of its employees to courses or participation in external events (e.g. workshops, lectures), as well as in other activities to boost self--worth, self-esteem and/or recognition.
Item 3.2.3	To the Technical Unit: Revisit the criteria that guide the review process (fact-findings, reports).
Item 3.2.4	To the competent area (Internal Affairs): Pay attention, during inspections or performance audits in the technical units, to cases of employees in the aforementioned situations.
Item 3.3.1	To the competent area: Study the feasibility of including topics related to **integrity/ethics** on the agenda of training courses for employees admitted through public entrance examinations.
Item 3.3.2	To the Technical Unit: Enable greater involvement and participation of employees in discussions that result in the unit's annual plan, as well as in other decision-making processes of collective interest.
Item 3.3.3	To the Technical Unit: Establish practices to recognize the good performance of employees [suggestions: keep praises in the employee's file; symbolic awards (recognition medals, buttons for the employee of the year)].
	To the Technical Unit: Study the feasibility of enhancing recognition mechanisms (scoring sources) in the "Employee's Results-based Recognition Program", as well as other ways to reward employees that make significant contributions to their Unit and the Institution.

Source: IntoSAINT Workshops

Innovation, Transparency and Public Participation in Oversight Activities Carried Out by Control Agencies: the *Contraloría y Ciudadano* Portal of the Comptroller General of the Republic of Chile

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ABSTRACT

This article presents the initiative of the Comptroller General of the Republic of Chile (CGR) to bring citizens closer to the control agency activities through a web portal that allows the submission of complaints, suggestions for audits and contributions to planned audits. The aim of the portal is for citizens to become collaborators in the oversight work of the CGR. After evaluating the portal against an academic model that seeks to classify the level of citizen participation in decision-making, it was concluded that through the *Contraloría y Ciudadano* portal, the CGR is willing to listen to the opinions of citizens. They consider them when defining oversight activities and providing feedback on the influence of these opinions in control activities, thus breaking with the one-way communication pattern normally associated with these portals.

Keywords: Transparency; Social Control; Citizen Participation; Electronic Portal; Innovation.

1. INTRODUCTION

According to Ackerman, the opening up of the core activities of the State to society participation is one of the most effective ways to improve accountability and governance (ACKERMAN, 2004: 448).

Gaventa and Barrett identify the construction of citizenship, increased civic and political knowledge and a greater sense of empowerment as positive results of citizen participation (GAVENTA; BARRET, 2012:2400).

Bevir argues that instead of appealing to a fallacy of expertise, we might explore the possibility of more direct involvement and control by citizens throughout the formation and implementation of policies (BEVIR, 2011:113).

Ribeiro recalls that the use of information and communication technology has been touted as a possibility to increase citizen participation and provide a space for interaction between government and society based on transparency, accountability and social control (RIBEIRO et al, 2011:105).

In this regard, Cepeda points out that the Comptroller General of the Republic of Chile has been making a remarkable effort to create links between the control agency and civil society, by encouraging citizen participation in its oversight activities (CEPEDA, 2013: 40).

In Chile, the Comptroller General of the Republic (CGR) is the supreme audit institution of the State Administration. The CGR is essentially responsible for controlling the legality of State Administration actions and operates independently from the Executive Branch and Congress (CHILE, 2015).

Its basic functions, which are provided for in the Political Constitution of the Republic, the Constitutional Organic Law and other specific laws can be divided into four areas:

- **Legal function** – control the legality of the Administration's actions;
- **Audit function** – conduct audits in order to ensure compliance with the law, the safeguarding of public assets and respect for the principle of administrative probity;
- **Accounting function** – generate structured and systematic information on economic events that modify the resources and obligations of the Staten in order to support the decision-making of the branches of government; and
- **Jurisdictional function** – review the accounts of persons or officials responsible for public funds or property or for ensuring the legality of the receipt and spending thereof as well as for the integrity of state assets.

This text addresses specifically the participation of citizens through a web portal accessed

Figure 1:
Contraloría Y Ciudadano portal

Source: CHILE, 2015b

via the Internet, in the audit function performed by the CGR.

2. *CONTRALORÍA Y CIUDADANO* PORTAL

On September 28, 2012, the CGR incorporated to its website, at http://www.contraloria.cl/, the *Contraloría y Ciudadano* portal, through which it receives complaints, suggestions for oversights and contributions for audits either under way or planned. The purpose of the portal, according to the text on its homepage, is for citizens to become collaborators in the oversight activities of the CGR (CHILE, 2015). Figure 01 below shows the portal home page.

The portal explains that suggestions and complaints should be focused on State Administration actions that are under the supervision of the CGR, thus including: centralized and decentralized public services; public companies established by law; businesses, companies, public and private entities with capital contribution from the State or its institutions; and all municipalities in the country. On the other hand, the portal informs citizens that the CGR does not audit the Legislative and Judiciary, the Central Bank, the Public Prosecution Service and commercial entities (CHILE, 2015b).

The portal also presents the formal definitions for submitting oversight-related complaints and suggestions. Complaint is a statement in which citizens provide the CGR with concrete information on one or more specific events related to a possible irregular situation carried out by an employee or to a service subject to oversight by the CGR, with the aim to investigate and determine the veracity of the complaint and the ensuing responsibility (CHILE, 2015b).

A suggestion for oversight, in turn, is defined as a proposal presented by citizens, who provide general information on any subject matter they believe should be inspected. The CGR informs that it reviews the suggestions and the relevance and impact of the subject matter which, if accepted, may be included in the audit planning process for the following year. After each audit planning process, the CGR generates an audit operating plan containing all oversights to be conducted during the calendar year (CHILE, 2015b).

Once defined, the audit operating plan is also posted on the *Contraloría y Ciudadano* portal, and citizens, in addition to viewing the name, purpose and time frame of the planned audits, can contribute information and documents they deem important to be reviewed in the oversight process. If citizens so desire, they can provide an email address to receive a copy of the audit report resulting from their contribution (CHILE, 2015b).

For both complaints and oversight suggestions, citizens identify the service or entity to be questioned, inform the approximate time frame of the occurrence and choose one or more classifications for the subject matter of the complaint or oversight suggestion. Subject matters listed on the form include quality of the service delivered; non-compliance with the function requirements; failure to respond to complaints; irregularities in bidding processes; matters relating to personnel and remuneration; provision of unpaid services; irregularities in the execution of contracts; financial irregularities; acquisition of non-income producing assets; malfeasance; and labor harassment (CHILE, 2015b).

The reason for the contribution is provided in a free text field, but for complaints it is also possible to attach files with photos and documents, and citizens can identify the possible parties involved (CHILE, 2015b).

3. RESULTS AND STATISTICS

The portal hosts a glossary and a list of answers to frequently asked questions, as well as statistical information on petitions and contributions posted since its launch. It informs, for example, that from September 2012 to May 2015, 8,439 petitions from citizens were registered, of which 7,627 (90%) correspond to complaints and 812 (10%) are oversight suggestions.

Table 01, taken from the portal statistics, shows how complaints and oversight suggestions are addressed. It is noteworthy that of the 8,439 petitions, 4,505 led to oversight activities by the CGR or were incorporated into other audit assignments in progress or already planned when the petition was posted. In the audit planning activity, 361 petitions were accepted.

In 917 of the petitions, citizens were requested to provide additional information in order to allow a better assessment of both the petition and the actions to be undertaken (Solicitud de antecedentes).

If the petitions are related to purely legal matters, the CGR rules on the interpretation or enforcement of laws, but this does not lead to oversight activities (Pronunciamiento Jurídico).

If the matters relate to substantive consultations or litigation, the CGR refrains from issuing an opinion (Abstenciones). Similarly, petitions outside the scope of action of the CGR are referred to other(s) institution(s) (Derivación a Otros Servícios).

It should also be noted that in May 2015 (the table generation cut-off date) only 31 petitions were pending analysis. This corroborates another statistical datum of the portal, which establishes at 8 business days the average time for the CGR to inform citizens, by e-mail, of how their petitions will be addressed. Moreover, the average time between the moment a citizen posts a petition and the answer by official letter or the transcription of the resulting research report is 88 business days (CHILE, 2015b).

It should be noted that all the necessary measures for the CGR to check the veracity of the information before initiating an oversight are taken within this response time. It is understood from the portal that the oversight activities generated by the petitions are divided into oversights and investigations. Oversight is a simplified procedure aimed at finding material and/or legal evidence of one or more events, actions or omissions. The investigation, in turn, is carried out in cases in which the financial amounts, authorities, individuals or geographical coverage of the events involved have an impact on citizenship (Chile, 2015b).

Table 1:
Processing of complaints and oversight suggestions taken from the Contraloría y Ciudadano Portal

	Audits	Planning	Inspection activities	Referred to other institutions	others	Abstain from issuing an opinión	Additional information required	in Progress	Total
Complaint	4.339	62	1.333	273	496	229	865	30	7.627
Oversight suggestions	166	299	52	16	219	7	52	1	812
Total	4.505	361	1.385	289	715	236	917	31	8.439

Source: CHILE, 2015b

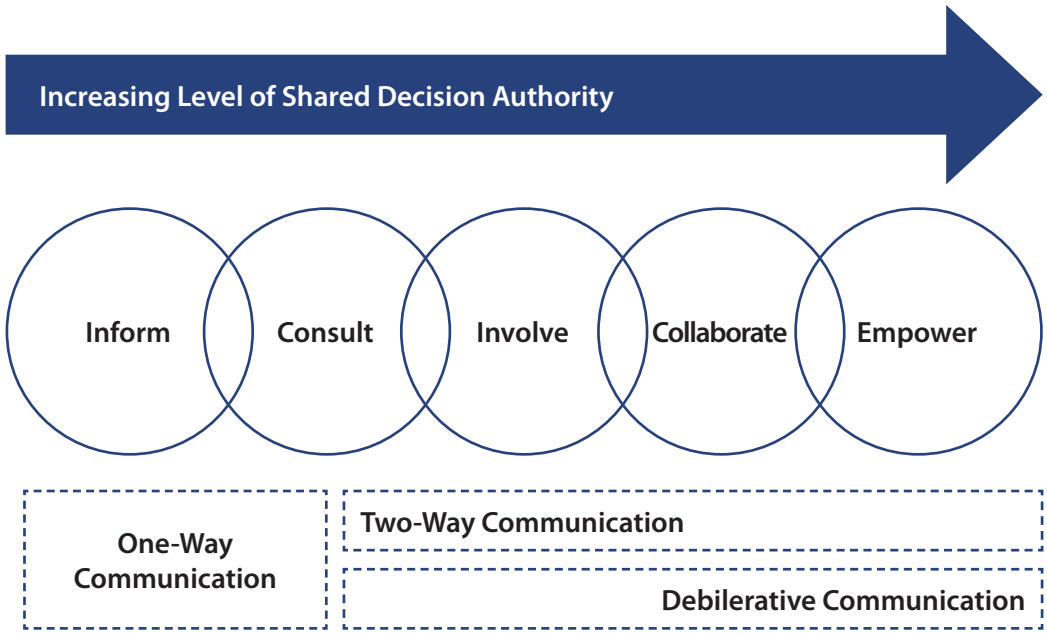

Figure 2:
Spectrum of participation levels in decision making, (NABATCHI, 2012:702)

4. ANALYSIS AND DISCUSSION

Nabatchi states that public participation is accepted almost universally as one of the foundations of democracy, whether indirectly through voting or directly through citizen participation in decision making that the State shares with or delegates to the community (NABATCHI 2012:700).

In this sense, Nabatchi presents a continuous spectrum adapted from the vertical spectrum produced by the International Association for Public Participation (IAP2, 2015), in which the author classifies the level of impact of public participation in decision making, emphasizing the communication methods used at each level, as shown in Figure 02.

At the initial level, **Inform**, communication is one-way, i.e. from the Administration to the citizen, often through websites, distribution of leaflets or direct mail. The goal is basically to keep the population aware of the problems, alternatives or opportunities and solutions.

At the second level, **Consult**, communication is still one-way, but from the citizen to the Administration and is generally conducted through surveys and questionnaires. The goal is to get feedback on alternatives and decisions made.

By moving along the spectrum one reaches the third level, **Involve**, in which communication is two-way, i.e. between the Adminstration and the citizen, and usually occurs through public hearings. The goal is to work directly with the public throughout the process, so as to ensure that their aspirations and concerns are understood and taken into account.

Bierle alerts to the danger of using this process only to legitimize the Administration's decisions rather than engage the public in the discussion. If that occurs, the two-way communication at the **Involve** level degenerates to the initial levels (Bierle 1988 in NABATCHI, 2012:702).

In the last two levels of the spectrum, **Collaborate** and **Empower**, communication is deliberative, i.e. all participants should have the opportunity to speak, the obligation to listen carefully to the contributions of otherd, treating them with respect and reflecting carefully about the strengths and weaknesses of each solution presented (Gastil, 2005 in NABATCHI, 2012:702).

At the **Collaborate** level the goal is to share with the public every aspect of the decision, including the development of alternatives and identification of the preferred solution. At the **Empower** level, the final decision is effectively placed in the hands of the public, and the Administration undertakes to implement the decision made by the public.

In view of the above, the *Contraloría y Ciudadano* portal can be classified in the continuous spectrum of public participation proposed by Nabatchi between the **Consult** and **Involve** levels, since the CGR is willing to listen to the suggestions of citizens, consider them in the definition of oversight activities and provide feedback on the influence of the suggestions in control activities.

However, citizen participation in the process does not reach the **Collaborate** and **Empower** levels, as citizens neither participate in the development of alternative oversight activities nor have the power to decide which oversight activities the CGR should carry out.

By analyzing the transparency actions of the CGR, Cepeda adds that it would be appropriate for the *Contraloría y Ciudadano* portal to publish the results of complaints and oversights stemming from the contributions and petitions of citizens, so that these could verify the effectiveness and consequences of this encouraged cooperation (CEPEDA, 2013:40).

5. CONCLUSION

In conclusion, the initiative of the Comptroller General of the Republic of Chile to promote citizen participation in its control activities through the *Contraloría y Ciudadano* portal, can be considered a breakthrough in terms of transparency and participatory social control. By making public the operational plan of audits while encouraging citizens to collaborate with audits either under way or planned and enabling the submission of complaints and oversight suggestions, considering them in the definition of oversight actions and providing feedback on the influence of the contributions in control activities, the *Contraloría y Ciudadano* portal breaks with the one-way communication pattern that is commonly found in similar portals.

This article is presented in the hope that other audit institutions will assess the convenience and opportunity of offering, in their web portals, these and other forms of encouraging citizen participation in their oversight activities, thus increasing participatory social control and enabling the generation of links between control agencies and civil society.

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Accessibility inside government buildings and facilities: the contributions of the public works audits of the Federal Court of Accounts of Brazil (TCU)

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SUMMARY

Accessibility inside federal buildings and facilities is a constitutional right guaranteed to all citizens. However, the federal government has not been complying with this constitutional requirement, according to recent audits carried out by the Federal Court of Accounts of Brazil (TCU). Based on these audits, TCU has been requesting that bodies responsible for such guarantees accomplish their institutional mission, particularly the Secretariat for Human Rights (SDH/PR) and the Secretariat of Federal Property (SPU/MPOG). Public works, remodeling or alterations in federal buildings and facilities must guarantee full accessibility, as set by the technical standards of the Brazilian Technical Standards Association (ABNT), particularly NBR Number 9050/2004. This technical paper aims to share experiences and the main results regarding accessibility, with data obtained from audits in public works in order to contribute to the technical improvement of public servants working at TCU as well as in other bodies of the federal government. As for methodology, the study was based on revision of legislation, as well as of the professional code of ethics of both architects and engineers. We also revised technical literature and analyzed summaries of audit reports and TCU resolutions, particularly (i) the performance audit carried out in 2011 on the accessibility of existing buildings, and (ii) the acces-

sibility evaluation in new buildings as part of the annual cycle of audits of public works (Fiscobras), from 2012 to 2014. We also present examples of theme audits in public housing programs (Minha Casa Minha Vida), education programs (Proinfância) and primary healthcare units (UBS) and emergency care units (UPA). Despite the legal deadline to turn all federal buildings and facilities into fully accessible buildings being long overdue - more than eight years now -, the results of the study indicate that there are still many challenges to overcome. To begin with, there is no specific budget allocation in the Federal Budget to increase transparency regarding the actions carried out and allows for the proper monitoring of investments regarding accessibility. In addition, our federal public servants are not trained to deal with accessibility. We understand that the Federal Government is far from achieving the minimum accessibility requirements demanded to comply with good technical standards. On the other hand, there is the contribution of TCU audits that encourage ethical behavior, especially for making this issue a priority. The ongoing demand also leads to reflection and innovation, seeking effective solutions concerning accessibility.

Keywords: Accessibility, Disabled Individuals, Senior Citizens, Ethics, Buildings, Public Works, External Control, Fiscobras, Secretariat for Human Rights, Secretariat of Federal Property, *Minha Casa Minha Vida*, *Proinfância*, Innovative Methodologies, UPA, UBS, *SeinfraUrbana*.

1. INTRODUCTION

The first myth that this technical paper intends to put an end to is that accessibility is an issue that concerns only the disabled. Despite being a significant part of the population in Brazil – figures are estimated at more than 45 million people (IBGE, 2013, chapter 8 - part 1), i.e. nearly a quarter of the country's entire population - people with disabilities are not the only ones affected by the lack of accessibility.

From an ethical and legal standpoint the implementation of the basic accessibility requirements at federal buildings and facilities concerns not only those with permanent physical disabilities and those with sight, hearing, intellectual or height impairments, but also those who, even if just temporarily, have reduced mobility and/or sensory abilities. This is the case of the elderly, sick, accident victims , those who have recently been through surgery, very obese individuals, pregnant women, mothers accompanied by infants (or with strollers), and others.

According to the Brazilian Institute of Geography and Statistics (IBGE) (2015), Brazil's population is getting older. Long-term projections (2000-2030) indicate that there will be a threefold increase in the number of senior citizens – they will be about 41.5

million citizens by 2030. Such growth in the share of the population with mobility difficulties, and loss of sensory or cognitive acuity is due to the decline in the fertility rate, according to the IBGE (2013). This means that there is great need for autonomy of the elderly and disabled, so they can carry out their daily activities, making the issue of accessibility something that concerns the entire Brazilian population.

Given the importance of this topic, this article will discuss the constitutional, legal, ethical and technological bases related to accessibility, listing some of the major works already undertaken by the technical units of the TCU. There will be a special emphasis on the results of the performance audit that focused on accessibility in existing federal buildings and facilities, as well as the observations of the annual public works audits (Fiscobras) regarding new buildings under construction.

As for the ethical standpoint, this article will resort to the thoughts of Mario Sergio Cortella, a philosopher, lecturer and researcher at PUC-SP with a PhD in education and 40 years of experience as an educator.

2. ACCESSIBILITY TO GOVERNMENT BUILDINGS AND FACILITIES AS AN ETHICAL, CONSTITUTIONAL AND LEGAL REQUIREMENT

According to Cortella (2013, page 15), the word "ethics" comes from the Ancient Greek ethos, meaning "the residence of the human", that is, where everybody lives together and shares everyday life. For this reason, it is essential that everyone adopt the principles and values of conduct so that everyone can coexist.

2.1 THE ETHICAL CONDUCT TO GUIDE THE ACTIONS AIMED AT ACCESSIBILITY

In the words of the distinguished scholar, "revisiting the ethics issue does not been doing it until people get sick of it. Instead, it means doing it until they are convinced of the importance of not letting our house [ethos] rot and deteriorate", given that the environment in which we live in not only gives us shelter but also "shapes us, giving us our identity. "He adds: (i) "if there is anything that leads to an absolutely strong background towards good ethics it is when someone, be that someone a child or an adult, is able to see examples (of it)"; and (ii) "ethics is not only related to politics, but it is also related to family, living together, the place where we live; (...) Ethics is not cosmetics, it is not a façade, one must be coherent to implement it" (Cortella, 2013, page 62).

This is also Zajdsznajder's view (2001: 21-22 and 30), for whom "ethics, rather than just empty words, is a way of doing things, how we base our decisions; (...) We live in a time when technology and strategy seem to debunk everything else, covering up and even pushing ethics aside" and he goes on to say: "an ethical attitude does not seek to condemn, but rather wants to avoid that; (...) if in some cases the recommendation is to punish, about the purpose is setting examples."

It is crucial that ethics is not thought of as mere rhetoric - the art of writing or speaking effectively -, but as a powerful agent that transforms reality. In order to do so, it should be aligned with the moral values and principles that guide human conduct, promoting the wellbeing of the entire population.

Regarding the urgency of implementing the basic accessibility requirements and its relation to ethics, it is worth mentioning Cortella (2013, page 78). "One of the most important things in forging people, whether they be researchers or independent professionals (...) is that they have a sense of duty and a sense of urgency (...) to comply with a deadline; (...) without delays or procrastination."

Many are the reasons given by public managers for not implementing fully accessibility in federal buildings and facilities. The most common and generic one is the lack of financial and/or human resources. However, it is public managers' duty to promote good allocation of resources to prioritize the most urgent issues. It is also their duty to protect the most fragile part of society to the detriment of other actions that can wait.

Regarding the ethical priority to be given to investments in accessibility, aiming to cater to a portion of those that are notoriously vulnerable, once again we bring to mind the teachings of Cortella (2013, pages 68 and 87.).

> (i) "When it comes to ethics, our values of conduct, our social life, our ability to think that people may think differently or act in various ways does not force us to believe that just because people are different, they are also doing the right thing; this can lead us to moral relativism; (...) There are ethical principles such

> as decency, honesty, solidarity, which are our references";
>
> (ii) "if we fail to have compassion, if we fail to look at someone who suffers as someone we are connected to, it threatens our ability to talk about the human condition; (...) I repeat, it does not mean feeling sorry for others; it means to feel, to understand and be sympathetic to the suffering of others as if it were our own."

The eventual omission of public servants responsible for caring for the public assets, particularly the duty to give full accessibility to all citizens, is an insult to ethics and morality. However, omission is also a violation of the law, for it disrespects the Constitution and the standards that regulate this matter. This is what we will show here.

2.2 THE CONSTITUTIONAL REQUIREMENTS CONCERNING ACTIONS AIMED AT ACCESSIBILITY

The 1988 Federal Constitution (CF/88) places the dignity of the human person as one of the foundations of the democratic state (article 1, item III). Article 3, items I, III and IV set the establishment of a free, just and solidary society, through the reduction of social inequalities and the promotion of the good for all, without any discrimination, as the fundamental objectives of the Federative Republic of Brazil.

Article 23, items II and V of the Federal Constitution (CF/88) establishes that the federal government - along with the states, the Federal District and the municipalities – are responsible for the care and protection of people with disabilities. In addition, they are responsible for providing this group with equal conditions, "the means of access to culture, education, science, technology, research and innovation" (Amendment 85/2015). In addition, article 230 also establishes a duty to assist the elderly, ensuring their participation in the community, safeguarding their dignity and well-being.

As a means to provide accessibility to constitutionally established rights, the Constitution itself establishes in its article 227, paragraph 2, that "the law shall regulate construction standards for public sites and buildings of public use (...) in order to ensure proper access to the disabled." However, it does not limit its extent to new buildings, for it also includes existing buildings (Article 244.): "The law shall provide for the adaptation of currently existing public spaces and public buildings."

There is no doubt that the denial to make reasonable adaptations to a federal building is unethical to a large number of Brazilian citizens, who have the constitutional rights to be assisted by state agents.

It is impossible not to pay urgent attention to the basic requirements of accessibility, under penalty of serious harm to several constitutional provisions. Besides the above-mentioned ones (articles 1, 3, 23, 227, 230 and 244), the lack of accessibility goes against the principle of administrative morality, set forth in article 37 of the Constitution. In the words of Zajdsznajder (2001, page 71), "we do not distinguish moral from ethics; the word ethics comes from the Greek ethos, meaning character or habit and also place of residence.. When the Romans translated it, they used the term mores, meaning habits. Both expressions try to capture something that is complex."

2.3 THE COMPETENT BODIES AND THE DEADLINES FORESEEN IN THE LEGISLATION AND REGULATORY ACTS FOR IMPLEMENTING FULL ACCESSIBILITY

The first deadlines for the government to ensure the full and effective functioning of the buildings, so that " the obstacles to the disabled can be avoided or removed, enabling their access to buildings" dates back to October 1990, i.e., twelve months after the enacting of Law 7.853/1989 (article 2, item V, paragraph "a", along with article 18).

In order to make the implementation of accessibility operative, the 1989 law established that "public-interest civil actions aimed at protecting common or collective interests of people with disabilities" might be proposed either by the prosecution or by any government body that "includes among its institutional purposes, the protection of the disabled" (article 3). Matters relating to persons with disabilities will receive priority treatment by the Federal Government (article 9, paragraphs 1 and 2) and its "plans, programs and projects are subject to deadlines and goals."

Twenty years later, Law 11,958/2009 has incorporated changes regarding Law 7,853/1989, giving authority to the Secretariat for Human Rights (SDH/PR) to promote superior coordination of all matters and measures related to people with disabilities, taking

advantage of their cooperation with other government bodies (article 10 and sole paragraph of the 1989 Law).

According to the various items of article 12 of the same 1989 Law, it is also the duty of the Secretariat for Human Rights: (i) to propose the necessary steps for the full implementation of the National Policy for the Integration of Persons with Disabilities, including those related to necessary resources and interaction with the Legislative Branch; (ii) monitor and guide the implementation of the policy by the Federal Government (bodies listed in article 9, paragraph 2, of the Law); (iii) maintain close relationship with them and help the federal prosecutors, along with the public officials of TCU, to start a public-interest civil action when necessary, by giving them the information and the evidence to do so (article 84 of Law 8,443/1992).

With respect to the services offered to citizens, there is also Law 10,048/2000, which establishes priorities for people with disabilities and senior citizens, through "individualized services to ensure special treatment and immediate care" (article 2). The same law reinforces the concern about accessibility in public spaces, restrooms and public use buildings, which must comply with the relevant technical standards (article 4). Finally, the Law states that any offenses committed by public servants and senior officials will be liable to the penalties provided for in the legislation (article 6, section I).

In chronological order, other important milestones were (i) Decree 5296 of December 02nd, 2004, which determined that the existing public buildings and facilities must ensure accessibility starting in June 2007 (article 19, paragraph 1), and (ii) Decree 6949 of August 25th, 2009, which granted the International Convention on the Rights of Persons with Disabilities (article 1) the status of constitutional amendment, stating that "the denial of reasonable accommodation" is a form of "discrimination on the basis of disability" were also significant milestones.

Finally, it is also possible to observe regulatory initiatives in specific areas, such as the institutions regulated by the Central Bank of Brazil, which launched the Central Bank Note 3369, of October 19th, 2007, which "demands compliance with the requirements of accessibility set out in Decree number 5296 of 2004", setting the year 2008 as the deadline. The Term of Commitment for Adjustment of Behavior (Accessibility TAC) is in force. It was signed on October 16th, 2008 by the Federation of Banks (Febraban), the federal prosecutors of the State of Sao Paulo and the federal prosecutors of the state of Minas Gerais.

2.4 PROFESSIONAL LEGISLATION AND CODES OF ETHICS TO ENSURE THE TECHNICAL QUALITY OF ACCESSIBILITY

Turning to the ethical and professional issues, it is important to emphasize that, in accordance with current legislation, legally qualified professionals must be responsible for the accessibility in buildings. Law 5,194/1966 provides that the studies, reports and any other engineering work may only be submitted for appraisal by the competent authorities and will only hold legal value to obtain, for instance, the budget for the work, when its authors are qualified professionals (articles 13 and 14). In addition, Law 6,496/1977 establishes the need for professionals to sign a Technical Responsibility Note (ART) in accordance with their Regional Council of Engineering and Agronomy (CREAS) (Articles 1 and 2). More recently, Law 12,378/2010 has required that architects have a Technical Responsibility Registration (RRT) at their regional Architecture and Urban Planning Councils (CAU) (article 2 and articles 45-47).

The ethics of engineering and architecture are an extension of the ethical standards that all people as human beings must follow. Ethical rules are among the rules of interaction that govern the relationship between individuals and society, in order to eliminate conflicts over (abstract) moral and conceptual issues, or (more concrete) factual matters. Engineers and architects have a longstanding widely recognized tradition of ethical behavior, for they must make difficult decisions about the appropriate allocation of resources in order to maintain acceptable levels of risk and safety (HOLTZAPPLE 2011, pages 34 and 52).

The lack of accessibility harms the principle of protection of fundamental rights of individuals as set by the Constitution and international agreements. It goes against the provisions of items 1.1.5, 2.1, 2.2.7 and 2.3.3 of the code of ethics and discipline of architects, established by Resolution CAU/BR Number 52/2013 (CAU/BR, 2013). Similarly, it hurts the human development goals and duties present in the professional code of ethics of engineers, as provided for in article 6 and 8, sections I and IV, article 9, subsection I, article 10, item I of Brazilian Federal Council of Engineering, Architecture and Agronomy (CONFEA) Resolution Number 1002/2002 (CONFEA, 2014).

The understanding that the solutions to accessibility must come under the scrutiny of a qualified professional to certify compliance with the relevant technical standards is also a part of the aforementioned Decree 5,296/2004 (article 11, paragraphs 1, 2 and 3). TCU Precedent 260/2010 also points out that it is the duty of public managers to demand the RRTs/ARTs related to architectural/engineering services (plans, technical specifications, budgets etc.), to ensure discipline and oversight of professional activities by special agencies, which aim to "protect public works from unregistered professionals for the sake of safety (TCU, 2014, pages 3 and 27-29)."

Even before the 2004 Decree, Law 4,150/1962 already required public managers to comply with the minimum technical requirements as set forth by ABNT. Thus, the Federal Government should follow the ABNT's 2004 standard of accessibility, NBR 9050, and meet the principle of legality set forth in article 37 of the 1988 Constitution.

Even in face of all legal and ethical framework presented, the country has had serious difficulties to implement full accessibility in public buildings and facilities, particularly federal ones. That is why TCU has devoted special attention to this issue, as we will show in the following section.

3. BRIEF HISTORY OF PUBLIC DIALOGUES ON FEDERAL ACCESSIBILITY TO PUBLIC BUILDINGS AND FACILITIES AND THEIR IMPACT ON THE PLANNING OF THE CONTROL ACTIONS BY TCU

On June 29, 2011, the Association of Prosecutors of the Public Accounts Ministry (Ampcon) launched the national campaign "Public Accounts Ministry for Total Accessibility". The campaign aims to "promote accessibility for people with disabilities or reduced mobility (including senior citizens), as set by ABNT, mostly through external control activities". The campaign has adopted innovative strategies to (i) educate senior public managers about the importance of building an accessible country, and (ii) through the Facebook page "MPC Full Accessibility", receive complaints, which "have been evaluated and redirected to different control agencies, according to their specific activities" (AMPCON, 2012).

The campaign is part of the Practices Bank of Institute Innovare, whose mission is to identify, reward and disseminate innovative practices carried out by judges, state and federal prosecutors, public defenders, assigned counsel and lawyers, with proven results on increasing the quality and updating the Brazilian Justice System (INNOVARE, 2013).

On September 21, 2011, TCU decided to join the campaign. The TCU-plenary stated that "because we consider accessibility an issue of great importance and because it is the duty of the Federal Government to provide the necessary resources for the full exercise of citizenship" we have decided to conduct performance audits "to assess the accessibility conditions in federal buildings and facilities."

Besides the external control actions, TCU invests in Public Dialogues on Accessibility. The technical debate "Control of Public Accessibility Policies", held on September 12 and 13, 2012 at TCU headquarters, was an opportunity to discuss the effective implementation of public accessibility policies in Brazil with representatives from government agencies and civil society as well.

More recently, on June 30, 2015, TCU held the Public Dialogue "Accessibility: a path to inclusion". Minister Raimundo Carreiro, Vice-President of the TCU, opened the event, which also counted on the active participation of Federal Deputy Mrs. Mara Gabrilli, rapporteur of the Brazilian Law of Inclusion of People with Disabilities, in the Chamber of Deputies. Prosecutor Sergio Caribé, a member of the Public Prosecution Office inside TCU and Supervisor of TCU's Accessibility Policy, coordinated the works and technical discussions. Many representatives from various government agencies came to the event, as well as members from public and private entities, such as the National Social Security Institute (INSS), CONFEA and public servants from TCU as well.

Our next topic is performance audit, but first we would like to highlight the fact that, as soon as TCU joined the Ampcon campaign in 2011, the then public works oversight departments began to incorporate procedures to evaluate accessibility in their standard planning matrix for public works and buildings audits.

4. PERFORMANCE AUDIT REGARDING ACCESSIBILITY IN EXISTING FEDERAL BUILDINGS AND SITES (2011)

TCU evaluated accessibility in six federal agencies and entities with the largest number of branches and customer service centers, namely: Brazilian Fed-

eral Savings Bank (Caixa Econômica Federal/MF), Brazilian Revenue Service (RFB/MF), Federal Public Defenders (DPU/MJ), Postal Services (ECT/MC), INSS and the Ministry of Labor and Employment.

Based on sampling techniques, the performance audits undertaken by the former Department of External Control and Government Program Evaluation (Seprog), with the support of the former 1st Department of External Control of Public Works (Secob-1), assessed the situation of accessibility regarding two main areas:

a. the accessibility inside buildings - checking tactile flooring and maps (for the visually impaired), elevators, restrooms, tables, counters, ramps, stairways, corridors and accessible doors (for physical disabilities); and

b. the accessibility of services offered by the same federal agencies, such as public servants able to interpret the Brazilian Sign Language - Libras (for the hearing impaired).

Regarding the methodology used by TCU, based on statistics resulting from a survey conducted with the public managers themselves, we would like to highlight that the ECT (Brazilian Postal Service) undertook their own survey and compared it to ours. By using a checklist sent to all heads of agencies, the ECT obtained obtained 5,630 responses. Despite the different methodologies, the results obtained both by TCU and ECT were very similar. Here are the numbers of the four major accessibility items (% of accessible buildings/facilities): (i) Tactile Flooring and Maps: TCU = 18% x 20% = ECT; (ii) Accessible Results: TCU = 28.6% x 25% = ECT; (iii) Accessible desks and counters: TCU = 49.4% x 49% = ECT; and (iv) Accessibility Ramps: TCU = 52.5% x 53% = ECT.

Besides public managers, the TCU team also interacted with representatives of 21 associations that provide support for people with disabilities. The perception of these groups corroborated the perception that public bodies generally lack accessible facilities, as well as proper furniture, well-trained personnel, etc., that meet basic accessibility requirements as set forth in NBR 9050/2004 (ABNT).

As a result of this audit, Ruling 2170/2012-TCU-Plenary of August 15th, 2012, recommended a series of measures to the above-mentioned federal agencies, in order to improve accessibility in their units. In addition, resolutions directed to the Secretariat for Human Rights and the Secretary of Federal Property were issued. In general, they requested action plans to remedy the deficiencies found by TCU.

Ruling 3244/2013-TCU-Plenary analyzed the request for reexamination filed by the Office of the Federal Attorney (AGU) and extended the deadline for the SDH/PR to present the National Plan for Accessibility (item 9.1 of the original decision), extending the initial deadline from 180 days to eighteen months (540 days) to meet the resolution. According to TCU, the plan should be comprehensive, strategic, and minimally contemplate the information obtained at the 1st National Conference on the Rights of Persons with Disabilities.

The Minister-Rapporteur of the appeal commented on the nonconformity with the determinations set by TCU (The vote that based Ruling 3244/2013-TCU-Plenary):

> We would like to point out that the determinations set by this Cour**t seek to remedy a series of existing violations of legal norms and regulations**. In this scenario, the first Ruling on the matter was correct (...)
>
> The **planning** set out by TCU **challenges** the Secretariat for Human Rights to fulfill its **institutional mission**, based on, I repeat, **Law 7,853/1989**, which provides support for people with disabilities and their social integration. (...)
>
> In this case, the resolution aims to **remedy** the **omission** of the Public Administration - particularly of the Secretariat for Human Rights – and **their duty to adapt, eliminate and remove** existing architectural barriers in federal buildings and sites (Article 23 of Law 10,098/2000.).
>
> According to a specific regulation from the executive branch, **existing buildings** for public use should "**ensure accessibility** to persons with disabilities or reduced mobility" **since June 2007** (article 19, paragraph 1 of Decree 5,296/2004). (...)
>
> The Secretariat for Human Rights seems to believe that its institutional mission is restricted to creating events, formulating ideas without the

> **effective solution of the problems experienced by people with disabilities**. Contrary to what the law establishes, it does not see itself as the body responsible for planning, coordinating, monitoring and guiding integration policies for the disabled, as set by **relevant legislation**.
>
> The difficulty that the Secretariat for Human Rights has in recognizing its institutional mission, however, does not exonerate it from **fully complying with its obligations according to the law.** (Highlights added)

In addition to what was stated in the Vote of the Rapporteur of the appeal, the MP-TCU, in a statement that is part of the report of the same Ruling 3244/2013-TCU-Plenary, adds that such national plan must include "not just a technical aspect, but also budgetary, financial and management aspects. It must also "be compatible with the federal government modernization efforts". With respect to the quality expected from the National Plan, the MP-TCU considered (i) "the difficulties that will be faced in a project of this kind, in view of the fact that the properties, in significant numbers, are scattered around the vast Brazilian territory" confronting these challenges with (ii) the need for "technical accuracy and quality excellence".

The performance audit judged in 2012 accomplished its goal of obtaining an initial diagnosis about the accessibility conditions in effect in federal buildings and facilities at the time. We recognize, however, that the diagnosis is only the starting point in search of the ultimate goal of achieving a truly accessible country. In other words, the federal government must not only recognize problems, but also work hard to find and implement solutions, putting public policies into effect.

In this sense, it is up to the SDH/PR to coordinate with other federal agencies, especially with the Secretary of Public Property of the Ministry of Planning Budget and Management (SPU/MPOG) pursuant to item 9.8 of Ruling 2170/2012-TCU-Plenary. The participation of SPU/MPOG is essential to demand the effective implementation of accessibility in federal buildings and facilities, and the effort is part of the "Federal Government Real Estate Equity Modernization Program - PMG/SPU." In the words of the current Secretary of the SPU, spoken in her inaugural speech: "we will collaborate for the reduction of social inequalities respecting the sustainability, security and **accessibility**; (...) to modernize **respecting citizenship** is our problem; (...) it is not only a revenue collection agency "(SPU, 2013, highlights added).

Finally, the judgement of the performance audit determined that **each of the six agencies** should offer and **internal plan** for the diagnosis and proposal of solutions to the challenges of accessibility (item 9.3). The decision also established that Segecex (General Secretariat of External Control) should include in the content of the annual rendering of accounts "an analysis of the measures adopted by the agency or entity to enforce rules on accessibility, especially Law 10098/2000, Decree 5296/2004 and applicable technical standards of the ABNT" (item 9.9 of Ruling 2170/2012-TCU-Plenary). The concepts and guidelines related to the "action plans" are found in TCU Resolution No. 265/2014, and, in short, require the plan to provide a description of the goals, deadlines and responsible parties (art. 2, item I, and art. 4).

Segecex complied with the determination through **TCU Normative Decision No. 134 of 12.04.2013** (Annex II, item 3.6). Thus, management reports to be submitted in 2015 (fiscal year 2014) should already contain the partial implementation of the respective plans.

The TCU has been monitoring compliance with the 2012 determinations (TC 020833/2014-8).

5. UNFEASIBILITY TO MONITOR INVESTMENTS IN ACCESSIBILITY IN EXISTING FEDERAL BUILDINGS AND FACILITIES: NO SPECIFIC BUDGET ALLOCATION IN THE FEDERAL BUDGET (OGU) (2015)

Public managers themselves consulted by TCU in 2011 identified the lack of financial resources for construction works and rennovation, as one of the most important issues impeding the accomodation of buildings and facilities to offer full access to people with disabilities or reduced mobility.

According to Castro (2013, p. 27-28), "investing in accessibility is synonymous with cost reduction; it is not difficult to construct a building prioritizing accessibility. Measured in numbers, the increase is no greater than 1.5% of the total value of the public work. However, this cost becomes considerably greater if a building is modified after construction is completed, about 25% of the total cost of construc-

tion; (...) a recent study by civil engineer Radegaz Nasser Junior from the state of Espírito Santo pointed out that property prices appreciate between 3.3% and 4.5% if they are modified to accommodate people with disabilities.

Although Law 10098/2000 (heading and sole paragraph of articles 22 and 23) provides for appropriation by the Federal Government of funds to carry out accommodation, elimination and removal of existing architectural barriers in buildings and facilities, the respective budgetary resources are dispersed in various programs and actions, consigned to each agency or public entity. This circumstance prevents the transparency of investments made and hinders oversight regarding the prioritization of resources to ensure accessibility.

For this reason, MP-TCU's opinion issued at the time of the performance audit report stressed the importance of specific classification in the Federal Budget (OGU). The Prevailing Vote in Ruling 2170/2012-TCU-Plenary ratified the importance of this issue. The TCU then concluded that it is up to the Ministry of Planning, Budget and Management (MPOG) to promote studies to evaluate the possibility of creation and introduction of this budget classification, or the adoption of another measure that enables the verification of investments in accessibility.

In addition to the provisions of Law 10098/2000, the provisions of the "Plan Living Without Limits", as per Decree 7612/2011, require that agencies involved in implementing the Plan ensure the availability, in a particular system, of information regarding the respective appropriations and the results of the their budgetary execution (article 8 and article 11, item I). Despite the above, to date there is no evidence that the MPOG has complied with the recommendations of item 9.7 of Ruling 2170/2012-TCU-Plenary, aiming at enabling the verification of investments in accessibility to public buildings and facilities.

On the contrary, research undertaken within the scope of the monitoring mentioned in the previous , regarding the Annual Budget Laws (LOAs) of 2014 and 2015 (program "2063 - Promotion and Defense of the Rights of Persons with Disabilities" and Organizational Unit "UO - 64101- Secretariat for Human Rights"), found that (i) the only functional classification nationwide (14.242.2063.210N.0001) shows the amount of R$ 6.73 million in 2015, and (ii) this amount reflects a 3% decrease compared to 2014.

6. ACCESSIBILITY ASSESSMENT IN FEDERAL BUILDINGS AND FACILITIES WITHIN FISCOBRAS (ANNUAL AUDIT PROGRAM) AUDITS

Since fiscal year 2012, the accessibility quality assessment procedures are incorporated into the standard planning matrix for the construction of buildings and facilities that are part of the annual cycle of supervision of works by TCU (Fiscobras). Initially, simple questions were formulated (checklist), about the existence, or not of (i) ramps, (ii) curb ramps, (iii) tactile flooring, (iv) accessible restrooms, among others. As experience was gained, , audit procedures began to incorporate more complete verification forms, including assessment of: (v) water closet grab bars height and (vi) service counters/windows, (vii) ramp slopes and rail height/clearance, (viii) width of hallways, and (ix) width of doorways, among others on a case by case basis.

The application of these audit procedures resulted in observations such as:

i. Construction of the Brazilian Central Bank Headquarters, in Rio de Janeiro, RJ: in the

auditorium - lack of seats for obese people and those with reduced mobility, and lack of ramp or electromechanical equipment for wheelchair access from the audience to the stage (Ruling 2928/2012-TCU-Plenary);

ii. Repairs and Expansion of Canarinho Stadium in Boa Vista, RR: slope and height issues with the access ramps to the bleachers (Ruling 2088/2013-TCU-Plenary).

Experiences gathered through individualized audits of major construction works in 2012 and 2013, allowed the expansion of the teams' procedures for Audits of Centralized Guidance (FOCs). Three thematic works are highlighted as follows:

6.1 EVALUATION OF ACCESSIBILITY IN HOUSING CONSTRUCTIONS IN THE MINHA CASA MINHA VIDA PROGRAM (2013)

Chapter 4 of the Preliminary Opinion of the 2013 Government Accounts presented analyses undertaken by the former Secob Energia based on "FOC quality of housing" of the Minha Casa Minha Vida Program (MCMV), focusing on the income bracket of the lowest income group.

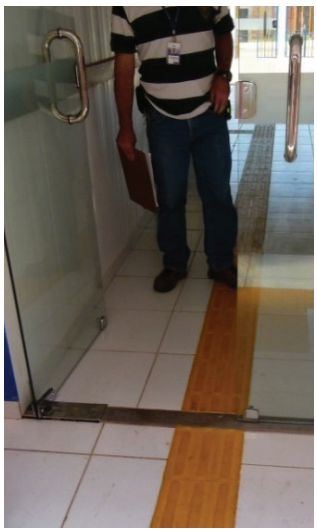
Based on a systemic analysis, program indicators were evaluated, particularly that of the goal "to promote accessibility" in the units offered by the MCMV. It was considered inappropriate for the Ministry of Cities to consider residential dwelling units as fully accessible units based solely on the fact that interior and exterior door openings met the minimum required width of 80cm. The concept of accessibility adopted by the Ministry does not adhere to the ones prescribed by Law 10098/2000 and Technical Standard NBR 9050 of the Brazilian Techbucak Standards Association.

Generally speaking, the construction sites visited did not have many of the alterations required in restrooms (installation of grab bars, sink and toilet with differentiated height, etc.) and stairs (modified handrails and guard rails, tactile flooring, larger shower compartments, etc.). They also did not meet minimum dimension requirements for circulation areas (both external and internal), or solutions for changes in level by means of ramps and/or elevators. In addition, no specific signals, such as audible and/or visual alarms, among other features were installed.

Some buildings in the MCMV program had up to five floors, without any plans for elevators. However, even in these cases, the Ministry of Cities labeled all of the building's apartments as "accessible", though access depended essentially on stairs. Therefore, it was concluded that accessibility indicators were unreliable.

Lack of accessibility in construction works under the MCMV Program was also reported in several in cities across the country, such as in Santo Estevão, in the state of Bahia (TC 019 675/2013-5), where an audit found that a residential dwelling unit intended for residents with physical disabilities was not in accordance with the required technical specifications. Access to the unit entrance consisted of a small dirt ramp, not aligned with the door, hindering the use of a wheelchair, which sank into the soil when wet. It is worth mentioning that it was the resident himself who built the ramp, as his unit had been delivered without any proper modification. In addition, the dimensions of said accessible unit doors were inadequate because internal door openings measured 70 cm and the restroom door opening measured 60 cm, a clear violation of NBR 9050 of the Brazilian Technical Standards Association, which requires a minimum of 80 cm. Finally, the restroom did not have shower and toilet seat grab bars.

There were similar findings in audits of public works in Rio Branco, in the state of Acre (TC 039947/2012-2). An audit of two modified residential dwelling units found that, in order to make the toilet and bathing room accessible it was necessary to increase its width. As a result, the toilet and bathing room had to be extended into the adjoining bedroom, since the total area of the "accessible" home was the same as the other residential dwelling units that were not modified. The bedroom was then reduced in size to 1.5 m wide by 3.2 m long, which does not meet the original technical specifications, since the smaller bedroom only fits a twin size bed, and not a double size bed. Thus, the unit, which originally would accommodate four people, became a three-person home. Also, the residential dwelling unit's external access ramps had a greater slope than the maximum allowed by NBR 9050, and there were stairs in the access to the back of the residential dwelling units, where the laundry sink is located. As reported by a wheelchair bound resident to TCU's team, occupants with disabilities tend to stay only inside their homes, because although the interior of the home maybe in



Pictures: obstacles without warnings on directional tactile flooring at innovative daycare center in Aparecida de Goiânia, GO.

theory modified to their needs, access to the outdoor areas is not. It is a situation that promotes social isolation when it should promote inclusion, as determined by the Federal Constitution.

Failure to observe accessibility criteria in public works projects in the MCMV Program were also observed in several other audit proceedings, such as the ones in Linhares, in the state of Espírito Santo (TC 039 957/2012-8), Colatina, also in Espírito Santo (TC 039 956/2012-1), Anápolis, in the state of Goiás (TC 041044/2012-6) and Areial, in the state of Paraíba (TC 019681/2013-5).

The operational audit of the Minha Casa Minha Vida Program (MCMV) was judged by Ruling 524/2014-TCU-Plenary, being it appropriate to highlight the Opinion Statement by the Honorable Minister Raimundo Carreiro. In addition to the required compliance with Law 10098/2000, the Minister points out that the Minha Casa Minha Vida Program, governed primarily by Law 11977/2009, must respect its art. 73, which contains provisions on the right to accessibility, stating that "ensures that a minimum of 3% (three percent) the total number of housing units built under the MCMV Program in each municipality are modified for use by persons with disability" (included by Law 12424/2011).

Therefore, Ruling 524/2014-TCU-Plenary instructed the Brazilian federal savings bank Caixa Econômica Federal, operating agent for the Minha Casa, Minha Vida Program and the Residential Lease Fund (FAR), to submit an action plan to "align properly the projects with the technical standards of accessibility designed for people with disabilities or reduced mobility. This is provided in Laws 11977/2009 and 10098/2000, as well as in other laws and regulations aimed at ensuring this right" (item 9.3.2).

6.2 EVALUATION OF ACCESSIBILITY IN THE CONSTRUCTION OF DAYCARE CENTERS, SCHOOLS AND SPORTS COURTS WITH FUNDS FROM THE NATIONAL EDUCATION DEVELOPMENT FUND - FNDE (2013 AND 2014)

The evaluations of accessibility in public works carried out with federal resources improved in number and quality with the '"theme" audits, which required new procedures.

In 2013 the construction of daycare centers under the Proinfância program, conducted by municipalities with FNDE resources, were audited. Based on the assessed risks, including lack of accessibility, duly illustrated by several pictures, new audits were proposed for the year 2014.

Regarding accessibility, it is important to illustrate the severity of the problems uncovered by the pilot audit conducted at the first daycare center built in the country through an "Innovative Methodology" in concrete-PVC (TC 002556/2014-6). Located in Aparecida de Goiânia, in the state of Goiás, the Proinfância program daycare center, although recently concluded, showed serious accessibility problems. Some of them were the design and installation of tactile flooring to convey directional guidance, which did not follow signaling logic (hazard warning) be-

fore obstacles such as glass doors, water fountains and even lavatories and sink counters, as shown in the pictures above.

The example of the innovative daycare center (concrete-PVC methodology), which brought gains in efficiency since it reduced the usual 18 months building time to about 4 months, but that does not fully comply with accessibility requirements, is an example that shows that innovation and ethics must go together. Innovation must be total, technological and ethical, as it can both promote as well as frustrate the well-being of citizens. Quoting Zajdsznajder (2001, p. 85), "technological culture seems focused on effectiveness; (...) ethical culture seems centered on the idea of good quality of life, that is, well lived." Ethics becomes a measuring tool of the effectiveness of the results accomplished by the changes brought about by innovation.

The audits in 2014 did not address only daycare centers, but also included educational spaces (primary and secondary education) and sports courts, as seen in Ruling 608/2015-TCU-Plenary, which adjudicated the consolidation of FOC, with a series of determinations to FNDE.

Generally speaking, the FNDE, when performing its duties as coordinator of policies, was instructed to, , observe accessibility requirements, including, in its in loco audits, "specific procedures to guide local managers and construction companies in this regard, in accordance with Law 4150/1962, articles 3 and 11 of Law 10098/2000, article 2, item I, and articles 8, 10 and 11 of Decree 5296/2004, and ABNT technical standard NBR 9050, in addition to article 3, item II, sub item e, of Resolution 24 of FNDE's Deliberative Council , dated 07/02/2012 "(item 3.6 – Ruling 608/2015-Plenary)

The determination aimed to correct and prevent the occurrence of things such as: (i) excessive height, as was the case of the service counters in the conventional design and the reception benches at the daycare facility in the innovative methodology; (ii) ramps that did not obey the maximum prescribed slope for access within the property; and (iii) installation of grab bars in restrooms in violation of height and clearance standards. This, in addition to lavatories and sinks with columns, making the approach in a wheelchair difficult.

In addition to the TCU, the Federal Supreme Court (STF) has also shown concern with accessibility in schools. "It is the duty of the state to remove any and all physical barriers, as well as to conduct the necessary repairs and alterations required in order to allow persons with mobility restrictions to access public school" (Ruling-Extraordinary Appeal 440028-STF -1st panel).

6.3 EVALUATION OF ACCESSIBILITY IN CONSTRUCTION PROJECTS OF EMERGENCY CARE FACILITIES (UPA) AND PRIMARY HEALTH CARE FACILITIES (UBS) WITH FUNDS FROM THE MINISTRY OF HEALTH (2013 AND 2014)

In 2013 a "FOC quality" of public works projects of Emergency Care Units (UPAs), was also conducted with funds from the Ministry of Health (Ruling 1101/2014-TCU-Plenary). More recently, in June of 2015, the consolidation report of the Fiscobras 2014 "health theme" audit, contemplating not only the UPAs, but also the Primary Health Care Facilities (UBS),was judged.

The results of these works demonstrate TCU's contributions to broaden the culture of accessibility in all federal buildings, but especially to those whose purpose is to guarantee the fundamental right to public health. According to Ruling 1426/2015-TCU-Plenary, the Ministry of Health was alerted "regarding the need for compliance with accessibility requirements for people with visual, physical impairments, among others, or with reduced mobility, in order to overcome the violation of articles 3 and 11 of Law 10098/2000, art. 2, item I, and arts. 8, 10 and 11 of Decree 5296/2004 and technical standard NBR 9050/2004 of the Brazilian Technical Standards Association coupled with Law 4150/1962" (item 9.1.12).

In this respect, the correction of the following irregularities was ordered: (i) excessive height of service counters; (ii) absence or inadequacy of ramps (inadequate slopes, preventing persons in wheelchair from moving with autonomy); (iii) grab bars in restrooms (water closet, lavatory and sink and shower compartments), in quantity, position, clearance and heights that do not meet standards; (iv) absence of or inadequate external access for wheelchair users and people with reduced mobility, by eliminating unacceptable slopes, steps and obstacles from the gate at the property line wall to the entrance door of each building; (v) insufficient width and/or presence of obstacles in the internal the units internal hallways, preventing the passage of wheelchairs; (vi) absence or inadequacies in tactile floors, which must respect

the signaling logic before each obstacle, such as doors or steps, making sure further to avoid obstacles in the paths; and (vii) lack of communication cards in Braille, in all areas, especially those that may pose risk to the visually impaired, such as laboratories and procedure rooms. It The Ministry of Health was also instructed to "guide borrowers of funds on the requirement of the Technical Notes or Records Form from engineers and architects for project design or implementation and supervision of public works projects."

In view of what has been presented in this topic, it is possible to see how TCU has been firmly acting to require compliance with accessibility legislation, indicating which problems should be tackled as a priority, highlighting the guidance and pedagogical nature of the actions that have been developed.

7. CONCLUSION

This article shows that, according to the technical teams' reports and TCU's decisions, full access to federal buildings is still a very distant reality. That is, although TCU teams' technical reports are not intended to show only the unacceptable side of accessibility in the country, they have a duty to disclose the critical situation found in federal buildings, existing or under construction.

This article also demonstrates that the goal of meeting minimum accessibility requirements established in ABNT technical standard 9050/2004 is attainable. However, one has to rely on public ethics tirelessly acting to bring awareness to public officials in charge, and to society as a whole society regarding the seriousness of the problem and its priority.

With respect to existing federal buildings, we note that the deadline given by the presidential decree of 2004 for all federal buildings to be modified expired almost ten years ago. The performance audit undertaken with respect to eight agencies responsible for planning, supervising, coordinating and implementing accessibility actions in more than 13,000 units that provide services to the public is being monitored by TCU, which also mandated that all federal agencies that provide ordinary accounts include the topic of accessibility in their annual management reports.

Federal buildings with different levels or obstacles, without ramps or electromechanical means of movement prevent the independent mobility of a person in a wheelchair. In addition to disrespecting the constitutional rights of people with disabilities, the lack of action by public officials in charge to ensure full access to federal buildings is unethical.

In this respect, we take the liberty of adapting a passage by Cortella (2013, page 50), which mentions a mere "banana peel", as an analogy to assess the character of the people responsible for eliminating architectural barriers. According to the professor, "a banana peel that is thrown on the ground [or a barrier to accessibility, such as a change in level designed without a ramp or elevator] is an expression of negligence [regarding the collective behavior]; a banana peel, which, when found, is left untouched, indicates someone who is complacent, who is negligent, who fails to do what should be done; the removal of banana peel from the ground shows someone who is cautious and well-mannered". Thus, he concludes: "banana peel on the ground, how it gets there, whether it stays there or is removed, oddly enough, is an ethical indicator.

In the search for effective solutions, we must review the existing accessibility, and carefully plan the necessary interventions, which is only possible with the participation of qualified architecture and engineering professionals. Public managers must seek the resources required to comply with their mandate. The TCU has been demanding from the agencies in charge, particularly the Secretariat for Human Rights (SDH/PR) and the Secretary of Public Property (SPU/MOP), the fulfillment of their institutional missions.

From an ethical point of view, public managers cannot be neutral with respect to the issue of full access because "the lack of deliberate acts is a choice, and, therefore also an act. When dealing with a nation, a democracy which is being structured in our society, we must protect it; also regarding the decency in our coexistence anywhere, ethical neutrality is extremely evil or dangerous"(Cortella, 2013, p. 77). Keeping in mind that basic accessibility requirements are determined by the law, the words of Rui Barbosa, in a speech given in Argentina in 1916 are fitting: "between those who destroy the law and those who observe it, there is no possible neutrality".

It is inadmissible to have architectural physical barriers in buildings, in the design or construction phase. As seen in this article, for almost three decades the Federal Constitution and a number of laws, decrees, codes of ethics and technical standards have been written and re-written to prevent this serious flaw. However, worse than the lack of solutions for accessibility, is to see that sometimes they are poorly

implemented, due to lack of technical knowledge, which is nevertheless a serious ethical and professional misconduct.

To illustrate this situation, we offered examples of accessibility issues identified in thematic audits in government housing (Minha Casa Minha Vida), education (Proinfância) and basic health care and urgent care (UBS and UPA) public works projects, which demonstrate that the TCU audits have contributed in encouraging ethical behavior, in particular the sense of priority in dealing with the issue. Continued demands also create the expectation of control, providing reflection and innovation, seeking effective solutions for accessibility.

To illustrate this situation, examples of accessibility problems identified in audits of the government programs for housing construction (Minha Casa Minha Vida), for education (Proinfância) and for primary and emergency care health units (UBS and UPA). This showed that TCU audits have contributed to promote ethical behavior, especially with regard to the sense of priority of the issue. Continuous demand also creates an expectation of oversight and this promotes reflection and innovation, aiming at effective solutions for accessibility.

As developments for future studies, based on the reported experiences, and to contribute to the elimination of bottlenecks, which still prevent the effective implementation of accessibility, we suggest the following:

i. further assessment of the lack of a specific allocation in the Federal Budget, to allow monitoring of investments in accessibility, suggesting possible solutions;

ii. the main causes that inhibit greater awareness and restrict incentives for training of federal public officials to deal with the problems of accessibility in the construction, renovations and alterations of buildings and facilities, also evaluating knowledge retention and sharing, the impacts of the rotation of public servants observed in some agencies;

iii. select best practices of internal accessibility plans of federal agencies, such as the creation of permanent accessibility committees, with authority to set and monitor compliance with targets;

iv. evaluation of case studies of alterations in historic or old public buildings;

v. legally assess the possibility of federal investments in accessibility when properties in which federal agencies are headquartered have been leased from third parties; and

vi. study cost saving innovations in accessibility;

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How to audit the ethical performance of a public body - A proposal

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1. THE AUDITED AREA

Auditing the way ethics is implemented in public-sector bodies subject to the scrutiny of Supreme Audit Institutions is a challenging task, as the discussions held and questions raised at the EUROSAI Seminar on Auditing Ethics-Related Issues of September 20131 demonstrated.

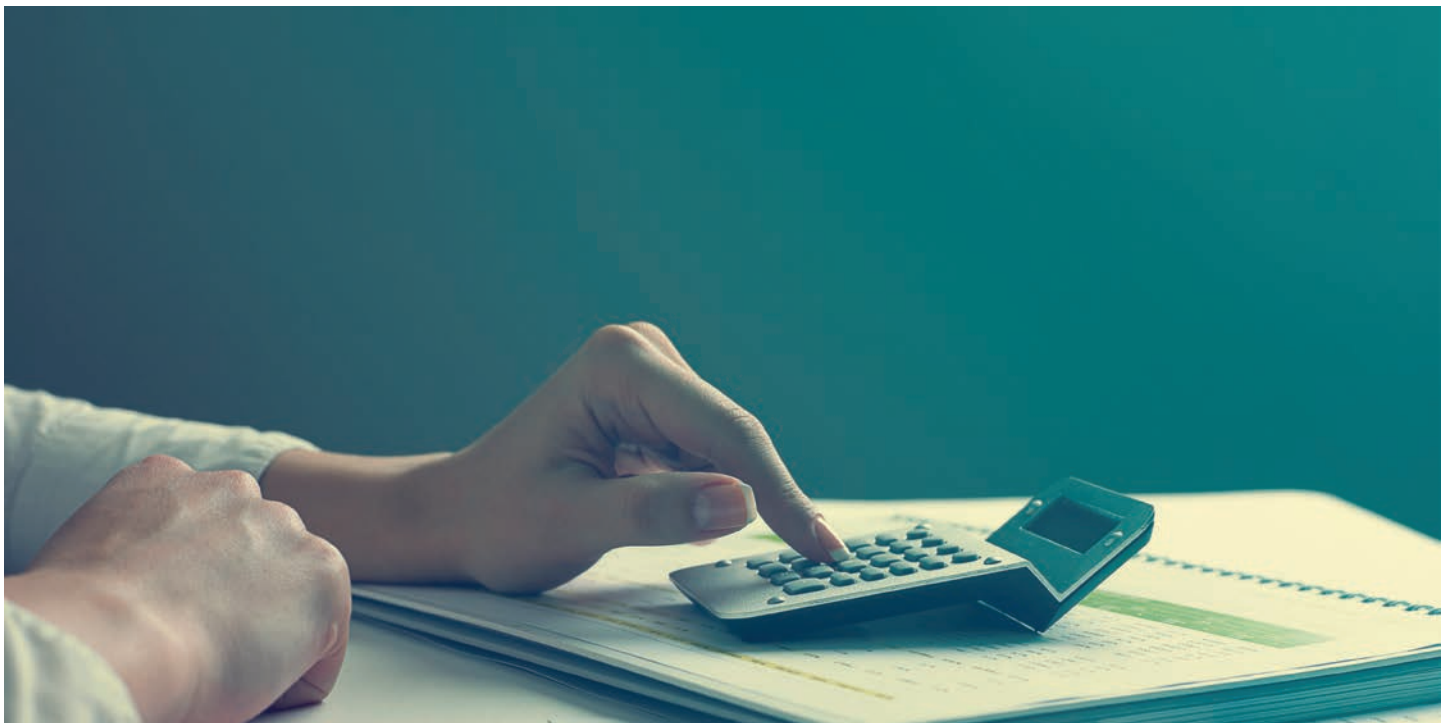
This article intends to reflect on a possible basis for carrying out such an audit. This reflection will, of course, have to be developed and adapted in the event an actual audit is carried out.

The logical starting point for this kind of audit is to look at the scope of the potential audited area, i.e. what the audit framework of the audited bodies consists of.

Typically, this framework – or ethical infrastructure – consists of several layers, like the steps of a ladder (see Figure 1).

The **first step** consists of compulsory provisions laid down by legal rules, including staff regulations stipulating civil servants' obligations, and remedies – such as disciplinary sanctions – in the event these obligations are not complied with. This is the first and minimal level of any ethical infrastructure: indeed, one can expect from a public body that at the very least no illegal act is committed.

In the **second layer**, we find other obligations and standards of public conduct, such as the duty to



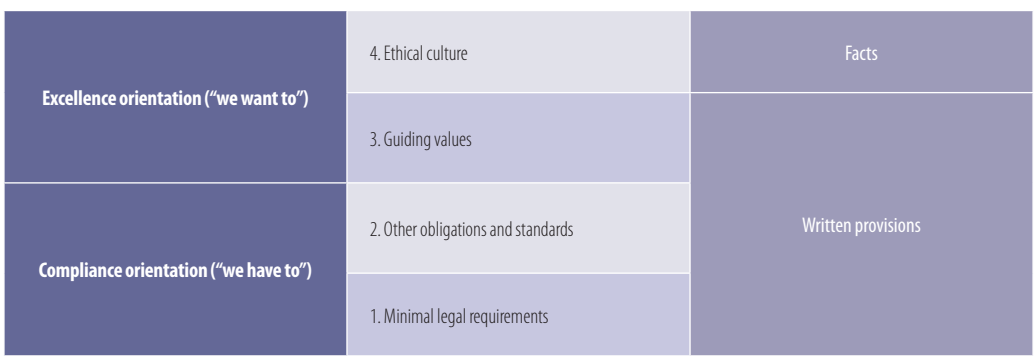
act with independence, in the event such a duty does not stem for a legal provision. Part of the independence standard is the avoidance of conflicts of interest, e.g. as laid down by the OECD2. At this point, we also find any other rule that the audited body has decided to adopt, such as provisions to protect the dignity of staff, the obligation to denounce reprehensible acts, etc. Some organisations may decide formally to adopt a code of ethics containing these tailor-made obligations applying to its staff.

These first two layers share the feature that they look at ethics as compliance with established rules. They aim primarily to prevent, identify and punish bad behaviour. The provisions they contain are enforceable, and consequences – such as disciplinary and even criminal sanctions – can be applied when such provisions are breached.

The next two levels belong to a different, yet complementary, approach to ethics, which considers ethics as a resource for better behaviour and decision making, and ultimately for better performance3, rather that just as a limitation indicating what should be avoided. The content of these two latter layers is largely unenforceable. Here the consequences are not sanctions, but positive outcomes if they are put into practice: a more serene working climate, more and better- quality output, increased reputation, and a better service to the public as the bottom line.

The **third layer** is the values that the organisation considers important: the values that should guide the strategy and daily operations of managers and staff and that are typically enshrined in a value statement, communicated to all personnel and stakeholders. These values are aspirational, insofar as they

Figure 1:
The layers of the ethical infrastructure of an organization



indicate which kind of excellent (not only rule-abiding) conduct and decisions the organisation is striving to achieve and demonstrate.

The first three layers consist of written provisions. This facilitates audit work, since one can at least check whether such documents exist.

All these written provisions, however, could remain little more than wishful thinking if they are not used and put into practice in the organisation's daily life. Here the actual, non-written ethical culture of the audited body enters into play – the fourth step in our ladder. This culture is composed of facts, such as the example provided by public servants at the top of the organisation (which we see as the single most important element of the ethical infrastructure), the time and resources spent in making ethics a priority (e.g. by setting up an integrity function, internal and external communication actions, training courses, etc.)

2. POSSIBLE AUDIT QUESTIONS

Looking at the ethical framework as described above, a number of key risks appear:

- some elements of the framework may not exist, which would be particularly unfortunate if the most important ones were missing: the first step, where legal obligations are laid down, and the fourth, which makes the whole framework operate in practice rather than just in theory;

- the elements of the framework may well exist, but not be functioning. This might be due to some internal inconsistencies in the ethical framework (e.g. the values declared have nothing to do with the obligations and standards in the code of conduct) or to the fact that the written provisions are overlooked when it comes to deciding the course of action to be followed in concrete situations;

- it may also be impossible to know whether or not the ethical framework is effective, since no measurement system has been put in place by the audited entity, or the wrong indicators have been chosen.

Based on this first list of the most obvious risks, the following pyramid of audit questions could be conceived (Figure 2):

3. POSSIBLE AUDIT APPROACH

To answer these questions, the auditors could look at the following elements:

3.1 THE EXISTENCE OF THE ETHICAL FRAMEWORK

1. The regulatory framework applicable to the audited body: legal provisions on staff obligations and standards, conflicts of interest, preventing and punishing misconduct such as corruption, harassment, etc.

2. Whether the audited body has decided to go beyond the minimal regulatory requirements and adopt tailor-made enforceable obligations and standards – which are compulsory for all staff, and aspirational values – which are intended to guide staff in making decisions and adopting the most appropriate course of action.

Figure 2:
Outline of a basic pyramid of audit questions, to be developed for audits on ethical performance

1. Is the ethical framework of the audited entity effective?								
1.1 - Does an appropriate ethical framework exist?			1.2 - Is the ethical framework working in practice?			1.3 - Does the audited entity monitor the implementation of its ethical framework?		
1.1.1 Do minimal legal requirements exist?	1.1.2 Has the entity adopted tailor-made obligations, standards and values?	1.1.3 Is there an integrity function in place?	1.2.1 Are all instances of illegal behavior detected and punished?	1.2.2 Are the audited body's values and standards applied throughout the organisation in daily conduct and decision-making?	1.2.3 Do top managers lead by example?	1.3.1 Are objectives laid down?	1.3.2 Are these objectives accompanied by indicators?	1.3.3 Is someone measuring them regularly?

Auditors could also look at the internal coherence between those tailor-made elements, for example whether the guiding principles are translated into operational and enforceable obligations and standards4 or whether, conversely, the values speak a completely different language from the compulsory requirements. If the latter occurs, it could be an indication that the values have been set up, maybe under pressure from stakeholders, without real conviction on the part of the organisations' leaders and, therefore, they are likely to remain theoretical rather than become a practical tool.

3. The way the audited body has organised itself to ensure the ethical framework works, e.g. by creating a function providing guidance and advice on ethics and integrity-related matters. Here the auditors may look at existing practices, and note for instance the difference between the approach adopted by the United Nations, where every agency has a senior staff member (at director level) in charge of the Ethics Office, and the approach by the European Commission, where a network of junior "ethics correspondents" has been put in place, mainly charged with assisting colleagues in complying with the obligations laid down by the regulatory framework.

By looking at the elements under 1.1.2. and 1.1.3., the auditors could also aim to ascertain whether the audited body has limited itself to a compliance-based approach to ethics, or whether they intend, at least in theory, to use ethics as a resource for increased performance and better service to the public. These elements would also allow them to determine whether the ethical framework is complete (have all the four layers above been taken into account and developed?) and coherent (are the various elements consistent with each other?).

3.2 HOW THE ETHICAL FRAMEWORK FUNCTIONS IN PRACTICE

1. Here the auditors should look first at whether all instances of reprehensible behaviour are detected and punished. Indeed, the organisation might be proud of having systematically applied no disciplinary sanctions at all to its staff for a number of years. This could well indicate that no breach in civil servants' obligations and professional standards has occurred. However, this could also present a distorted image, as is the case for other indicators proving an ambiguous image: e.g. if an external audit body tries to maximise the number of recommendations accepted by the auditee to measure its influence capacity, it may be tempted to water down some of the recommendations for the sake of ensuring the maximum number are accepted. Similarly, a lack of disciplinary sanctions might indicate that breaches in obligations and standards, if they occur, go unnoticed or, when they are detected, are not actively pursued. Appropriate audit criteria need to be developed, based on the nature and organisation of the audited entity, to assess whether this is the case.

2. The emphasis should then be on establishing to what extent the various components of the ethical framework, the existence of which has been established under 1.1., are applied as a routine practice by managers and staff, rather than remaining merely a beautiful picture that nobody looks at. This is possibly the most difficult task in this kind of audit: what is measurable here? What should be measured in practice?

A comprehensive measurement framework is provided by two renowned ethics experts, Joan Elise Dubinsky (the current director of the UN Ethics Office) and Alan Richter: in their Ethics and Integrity Benchmarks5, they provide "a tool for helping organizations assess and measure their progress in making a formal and transparent commitment to ethics and integrity in the workplace"6. In our view, these benchmarks, organised around twelve key areas, can be used not only by managers and ethics officers in the organisation itself, but also as a reference point for external auditors charged with assessing the performance of the ethical framework of such organisations.

Auditors could also be willing to look at what happens within the organisation's everyday life. For instance:

- is ethics something managers and staff talk about freely and regularly? (A private-sector organisation decided to name its meeting rooms

according to its values; the fact that people knew they were going to meet at the "Integrity" meeting room, or the "Transparency" room, helped them remember what the organisation, and each one of them, were striving for);

- do the audited body's official decisions refer to the organisation's values and standards in their recitals? (If not, this could indicate that the values and standards the organisation has chosen to adopt play little or no role in the actual decision-making process);

- do training courses focus on compliance only, or do they provide the staff with tools for making sound ethical decisions, such as the ability to recognise and address ethical dilemmas when they encounter them? Are special training programmes devised for specific functions, such as managers, civil servants in charge of financial management, etc.?

Particular attention should be paid in this context to the tone at the top. As the US expert in ethical dilemmas Rushworth Kidder pointed out, nothing fosters the development of an integrity culture more powerfully than the values visibly shown and practiced by the top management; and nothing destroys it more rapidly than a do-what-I-say-not-what-I-do attitude. Here, it could be useful to ask the staff (through questionnaires, surveys, etc.) about their perception of the way their managers lead by example, and to distinguish between top managers who have been politically appointed and those who have not.

3.3 THE WAY THE AUDITED ENTITY MONITORS THE IMPLEMENTATION OF ITS OWN ETHICAL FRAMEWORK

At this point, the auditors could check whether the audited entity has a thorough knowledge of the ethical framework in which it operates, and what the basis for this knowledge is. Typical questions could be whether objectives are set for the organisation's ethical performance, whether indicators exist to measure progress towards these objectives, and whether someone within the organisation actually measures such progress. One could also look at whether the indicators not only exist, but are the right ones (see 1.2.1. for an example of an ambivalent indicator).

A useful checklist for public-sector bodies carrying out such monitoring is provided by the OECD7, and consists of a series of questions and sub-questions:

- Are the basic principles and standards clear?
- How is an ethical culture fostered?
- Is there adequate oversight and accountability?
- Is the public well informed?

As we indicated at the beginning, this article presents ideas and proposals, based on the author's personal experience and research; they should be developed further in the event an actual audit on the ethical performance of a public-sector body is carried out.

In particular, audit criteria and methodology should be strengthened and fine-tuned, depending on the nature, organisation, and operations of the audited entity.

Our intention, and our hope, is that this article will stimulate the debate launched in September 2013 and will provide some useful, and useable, food for thought.

NOTES

1 See Journal of the European Court of Auditors, October 2013, p. 16 (http://www.eca.europa.eu/Lists/ECADocuments/JOURNAL13_10/Journal-Octobre2013-WEB.pdf).

2 See OECD (2005), OECD Guidelines for Managing Conflict of Interest in the Public Service (www.oecd.org/gov/ethics).

3 According to Peyman Akhavan, Majid Ramezan, Jafar Yazdi Moghaddam, Gholamhossein Mehralian, (2014), there is "a positive and strong correlation between ethics and organizational performance", see "Exploring the relationship between ethics, knowledge creation and organizational performance: Case study of a knowledge-based organization", VINE, Vol. 44 Iss: 1, pp. 42 – 58

4 A good example of a coherent framework encompassing values and obligations is the Code of Ethics of the Project Management Institute (http://www.pmi.org/About-Us/Ethics/media/PDF/Ethics/ap_pmicodeofethics.ashx). This code also presents the advantage of establishing a clear distinction between mandatory standards (accompanied by possible sanctions in the event of a breach) and aspirational ones.

5 See http://qedconsulting.com/files/GlobalEthicsandIntegrityBookmarks_2015.pdf.

6 From the Introduction.

7 OECD, "Ethics Checklist", Paris, November 1997, quoted by Carol W. Lewis and Stuart C. Gilman, The Ethics Challenge in the Public Service. A Problem-Solving Guide, Jossey-Bass, San Francisco, 2005, p. 226.

Innovation in Cleaning Services in the Public Administration - Idealism or Need?

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ABSTRACT

It seems logical and common sense saying that in all contracts, the government should seek alternatives to help address the needs at the lowest possible cost, attending to the principles of efficiency and economy. However, no matter how clear such guidelines are, in many cases, the actual or apparent clash with other principles and rules puts the public administration in a disadvantageous situation, difficult to elude.

This article aims to show how, in the case of procuring cleaning services for the public administration, the legal and the technical reference frameworks have been associating the administration with uneconomical and inefficient situations, and managers, in most cases, do not realize the gravity of the waste.

To this end, this paper presents the problems resulting from the indiscriminate use of the Regulatory Instructions (IN) of the Ministry of Planning, Budget and Management (MPOG) as a reference for productivity and cost in procurement estimates. It also addresses, the failures related to the generality of most of the standards, or nonspecific use, indistinctively; and the deficiencies revealed by the evidence of undersizing productivity. Both represent a high risk for contract overpricing.

In addition, in order to curb deviations and overbillings and to safeguard the administration of joint and subsidiary accountability, respectively, in social security

and labor matters, the legal framework for public procurement has been insisting too much in the control of the means used by companies, to the detriment of supervision over the desired object. Such behavior, as demonstrated in this study, besides resulting in unnecessary transaction costs, it hinders the increase of the company's efficiency and innovation.

In order to overcome this model, which has proved costly and outdated, this study proposes innovations at various stages of the procurement process, all of them pursuing increased efficiency, economy, and even sustainability, since they are determined by greater rationality in the management of resources for the implementation of services.

We propose, here, to develop a concrete project for the cleaning solution during the planning phase, especially considering the routines actually needed, and the respective resources, instead of using MPOG regulatory instructions indistinctively. It is also demonstrated not only the need, but also the perfect opportunity, to change the paradigm which states that all cost reductions by contractors that result from efficiency improvements, must be addressed with contractual rebalancing.

The intention is, in short, to provide a purposeful, innovative model, based on gain sharing, a concept that has for a long time now been implemented in US government agencies. A model with which the Public Administration has much to gain, both in the short term, by eliminating waste, and in the long term, through the exchange of knowledge and the incorporation of the technologies used in the most efficient practices.

Key Words: Cleaning Services; Project; Innovation; Increased Efficiency; Focus on Results.

1. INTRODUCTION

Nowadays, almost all non-core services for public organizations, including cleaning, are mostly outsourced. With a few exceptions, in which the institutions have government employees to carry out these tasks, outsourcing is the norm.

The professional cleaning market earned BRL 10 billion in 2009 and has been growing at an approximate rate of 10% per year since then (ESCOBAR, 2010, apud SANTOS, 2014, p. 16). The government is responsible for about 60% of this demand. The Federal Government alone paid BRL 2.4 billion in 2014 for cleaning and conservation services. By way of comparison, the value is larger than the entire budget of the Ministry of Agriculture Development, or equivalent to 30% of the Transport Ministry's budget for 2015, according to the 2015 Annual Budget Law.

Despite the magnitude of this expense, there is certain amateurism in public procurement of cleaning and maintenance services and a total disinterest in a "solution project". Yes, contracting cleaning services requires a project with its own methodology, based on

empirical studies and surveys. It is a false assumption that cleaning services are trivial and easy to be estimated, planned and executed. This follows from reductionism, and it is only maintained because of the overall lack of management on the subject. Indeed, "hiring people", providing a bucket, a mop, a vacuum cleaner and other instruments; and "letting them get to work" in a building with the mission to do the cleanup can be simple, and indeed it is. However, this is far from being a professional cleaning service contract.

In this study, we analyze the impacts of the lack of expertise in the procurement of cleaning services, which, at the same time, are the cause and consequence of the imprudent use of parameters set by the Federal Government. Moreover, we discuss the delays fomented by the incorrect application of the legal framework to public procurement, which has been hindering company's initiatives aimed at increasing efficiency.

2. HIRING CLEANING SERVICES – CURRENT REFERENCES

The lack of expertise and lack of interest in the study of cleaning services is partly triggered by the initial regulatory framework. Under the reform of the state structure and in accordance with the strategy to move towards a managerial public administration, the Federal Government, on October 30, 1996, issued the Regulatory Instruction MARE No. 13. During this period, it was issued the first ordinance for setting the maximum amounts for each state for procuring cleaning and conservation services.

In 1997, the Normative Instruction 18, known as IN MARE 18/1997 revoked the IN No. 13/96, however, it maintained the system of setting maximum amounts for procuring cleaning services through an ordinance, issued annually. Conjointly, the MPOG outlined basic guidelines for the specification of cleaning services and set minimum productivity levels to be observed in basic procurement projects[1]. The standard thus defines, for example, that under normal conditions a professional cleaner, in an 8-hour workday, should be able to clean at least 550 m2 of internal areas. Similarly, productivity rates were set for cleaning external areas, and window frames, among others.

The beneficial effects of these measures are undeniable, especially since it added uniformity and standardization into what before was devoid of any criteria. Two agencies that eventually had similar premises structure could have gross cost differences of 100% or 200% per cleaned square meter, and there was no objective criteria to question such a difference. These indexes were subsequently amended in quantities and levels of detail by IN - SLTI/MPOG 2/2008 and 3/2009, and we must point out that the former is even today the main reference for procuring continued accessory and instrumental services. In fact, from now on, in this article, the IN 02/2008 will be only identified by the initials "IN".

Thus, the contracting model for cleaning services, which is now being used by the government as a whole, was prepared based on the productivity levels set by the IN 18/1997 and its new editions.

However, the use of the standard has conflicting aspects that should be considered. The first one arises from the very nature of generalization: dangerous and reckless – which violates the specifics of concrete situations. We are not saying that the standard has imposed this generalization, because in the text of the article itself minimum productivity values are indicated for "normal conditions". However, it is clear that the existence of a standard, or a default, induces the user to apply it to the detriment of alternative values.

Nevertheless, the problem lies in what the standard was not intended for. The rule was not set to undergo more than 15 years of managers' apathy to study its characteristics, propose detailing, design the cleaning of the respective premises, and conduct empirical surveys. Finally, the standard was not meant to be the symbol of the lack of innovation implemented in the following decades. It came into existence to become a generic beacon in what were best practices, but managers ended up outsourcing the cleaning services projects to the IN, and this, due to the generalization already mentioned, and because of its own weaknesses, which we will mention later, is not a suitable mean for that purpose.

We must not hurry and jump up to conclusions, especially to condemn the planners of contracts. The responsibility for the complacency is partly due to the standard, but we must emphasize that it is only partly responsible for that. The standard provides a comfortable framework, where one does not need to act. In order to procure cleaning services, one needs just to estimate the area of the building and apply the coefficients of the standard. Believe it or not, that is what almost everyone does.

So far, nearly two decades since the issue of the IN Mare 18/1997 went by, and the administration has not evolved in the cleaning services project. It reminds us of the parish story of the backyard room. Who has never had or known someone who had a provisional

and precarious room in the backyard? The backyard room certainly happens to be a temporary thing, built to address a momentary need, and eventually be replaced by something better, definite. Well, the IN figures should be just that: temporary, subsidiary, referential. However, in order to replace them, we must change the course of action; it is necessary for the agencies and entities to work on their own estimates, that they know the details of the services and their possible variations, depending on the type of building, use, type of finishing, coating of surfaces, etc.

3. FRAGILITY OF PRODUCTIVITY AS DEFINED IN IN 02/2008

Knowing this, and already starting to analyze the contents of the IN, we observed that its values and standards of productivity have no technical or empirical basis (SANTOS, 2014, p. 68-69). The explanation obtained as to the sources of such indices, was, ultimately, that they follow from productivity indices used by the Government of São Paulo State, which, in any case, only reproduce the average of contracts in force at a given time.

Furthermore, the productivity values indicated in the IN show to be clearly undersized when compared with standards set in the ISSA 540 standard, published by the American institution ISSA - The Worldwide Cleaning Industry Association, which has been dedicated to the study of Facility Management since 1923.

Let's consider, for instance, the hypothetical situation of the activity "carpet vacuuming": According to the ISSA 540, the productivity by the cleaning worker for carrying out the activity is up to 929 m2 per hour or 7,432 m2 per day (considering an 8-hour workday), depending on the technology of the vacuum cleaner used and the type of area to be cleaned (large areas, areas with obstacles, etc.).

The IN sets that the indoor carpeted areas must be cleaned at a rate of at least 600 m2 per day. However, it does not attribute an isolated single productivity indicator for the activity of "carpet vacuuming" as in the ISSA 540. The IN includes values for other indoor activities: cleaning furniture, emptying bins, cleaning walls and partitions, among others.

Thus, in order to compare the two productivity indicators it is necessary, first, to establish a common basis for comparison in which both sides consider equivalent services. This will be the basis for the following example: the "cleaning of an indoor area of 10,000 m2 with carpet floors, containing 100 bins". Thus, as shown in Table 1, in order to measure work force based on the ISSA 540, it is necessary to relate and calculate individually the effort for each of the activities, such as removing garbage, cleaning furniture, etc. Note that in the table, next to the description of each activity, there is the amount of estimated employees needed. In the IN estimates this is not required, because the set value (600 m2 per day) is supposed to include all activities necessary to maintain the area clean. As a result, the work force needed with reference to the ISSA 540 is 5 employees; and, according to the IN, 17 people are needed.

The difference is evident. If we followed ISSA 540 productivity indicators, the number of employees would be reduced to less than a third compared to the number calculated by the IN, under the same conditions.

There is a high risk that the entire government is oversizing its structures for cleaning services, and, we must point out that they do it without incurring into strict illegality, since they act based on the IN. And, that is the problem: the standard legitimates waste. It can be argued that it merely lays down a minimum productivity level, but it would be up to the manager to properly design the solution under real conditions. However, this is an at least simplistic, abstraction, to address the problem. The standard induces the behavior of managers, which, lacking the expertise on cleaning and trying to avoid risks, prefer to follow it.

What is worse is that, once the number of workers resulting from the application of the IN are contracted at certain public building, the difficulty to decrease it

Table 1:
Comparison between the ISSA 540 and IN 02/2008 standards – Calculation of work force needed for cleaning a 10,000 m2 indoor area, with 100 bins.

Standard	ISSA 540	IN 02/2008
Activities involved	Rubbish removal: **0.144 workers** Cleaning all horizontal surfaces up to 1.50 m high (furniture): **1.789 workers** Vacuuming, removing stains and carpet floor washing: **2.622 workers** Careful cleaning of corners, edges and baseboards: **0.054 workers** Cleaning walls and partitions: **0.118 workers**	Cleaning of indoor areas: **17 workers**
Estimated work force	5 workers	17 workers

in future procurement will be much higher. The public servant responsible for re-procuring the service which is already being executed according to the parameters set by the regulatory instruction will be further forced to maintain the status quo. This is because it will look like the model is "working out" (as in most cases the structure is swollen, the minimum expected is "that it works"); an attempt to plan a solution again, with a possible decrease in the quantity of workers will face suspicion from in-house sectors; pressures from the outsourced company itself, for fear of losing their job; possible quarrels promoted by Unions; challenges and questions from bidders.

In short, a whole chain of resistance will be imposed on the manager who, pressed by the urgency and by that lack of technical expertise, will let himself to be led by the IN numbers. On principle, there will be no questions and everyone will seem to be satisfied, except the public interest.

4. THE RISK OF AN UNENFORCEABLE PROPOSAL

The IN is not the only cause of the drawbacks discussed here. As a rule, the bidding method used for procuring cleaning services is the Electronic Auction, suitable for common goods and services. In addition, it is known that one of the biggest problems faced by administrative contract managers is the famous "dive" that takes place in the electronic auction sessions. Adventurous companies, unprepared, which, careless, during the public session, start lowering their bids to win the contract. While Law 8666 of 1993, art. 48, and the IN itself in art. 29, provide for mechanisms to assess the feasibility of the proposals submitted in the bid, giving the administration the right to refute what may be considered unfeasible, in practice it is very difficult to get such disqualification, especially when it comes to cleaning services. There are no productivity indicators to serve as a minimum standard. To mitigate this risk, the alternative most widely used in procurement procedures is to fix the quantity of people to be included in the proposals. Thus, the amount of the estimated work force in the planning phase, based on the IN, becomes fixed as the minimum required in the proposals, under penalty of disqualification. In fact, in these circumstances, companies do not have much else to offer, since the work force quantity, which represent over 70% of the contract, was previously set by the administration. Then, they will just fill in spreadsheets of costs for payment of work force.

5. THE OVERESTIMATION OF MEANS AT THE EXPENSE OF PURPOSES

The procuring process that was initially focused on providing cleaning services starts to be excessively concerned about the quantity of people. This is where the administration loses focus on the procurement purpose. Once the contract has been signed on such terms, it is agreed that the service will be provided by a given number of people, which becomes the supervision keynote. It seems natural for the supervisor that, considering the consignment in the announcement, in the proposal and in the service agreement, the minimum personnel structure is "x" workers, so, it must be checked that all of them are actually working.

In addition, the company, in order not to suffer sanctions and items cancelled, will religiously provide the number of people as agreed, and it is not required, at any time, to evaluate whether this number of people is necessary. At this point, neither party is any longer concerned with increasing efficiency. That number of people will be a constant, even for future contracts.

And why cannot that number be decreased? Can it be possible that an outsourced company, running the same services for five years in the same government agency, is not able to redefine or optimize routines, add technology, in short, that it cannot, in no way, increase productivity and decrease the number of its employees? Obviously, the companies can, but they do not want that.

In the current contracting logic, in which the company puts certain number of people and certain amount of material in the institution, and earns over this a management fee and profit, it is true that the higher the value of the contract, the better for the company. There is no reason for it to make efforts trying to make the contract more efficient. On the contrary, in this system, a possible decrease in the personnel structure due to gain in business efficiency, will unequivocally generate a contractual rebalancing due to the removal of the corresponding values. Now, anyone facing such prospect would never propose a readjustment.

This is precisely the second cause of immobilization and perpetuation of the IN values. Firstly, due to inertia, security and trust in the standard, the public administration uses it indiscriminately and procures cleaning services based on the productivity parameters set by it; secondly, in order to protect itself from the risks of "diving" during the bidding stage, this structure must be observed by the outsourced companies, under

penalty of disqualification of tenders; and, thirdly, the rationale is:"if the company considered a number of employees in its proposal, then it is obliged to provide them in the contract execution, under penalty of being accused of overpricing;" and lastly, at a fourth stage, any attempts to decrease this quantity by increasing business efficiency is considered a reason for rebalancing the contract in order to reduce the values.

It thus forms a vicious cycle, tough to be stopped. The aura of legality given to the indicators and the crusade to curb any extra gain by the service providers generate waste in the public administration.

6. THE NEED FOR INNOVATION

It is necessary to rethink the rules for defining the required structures. Managers should truly justify the proposed numbers to perform cleaning services, not only formally, by telling in a few words like "the structure is within the minimum limits set by the IN"; no, this is the least they can do! It is imperative that much more is projected: the details of routines, timing of performance of each routine, related equipment, alongside with their respective productivity parameters, the main materials to be used, etc. Always considering the different possible alternatives. These studies will indicate a structure for a particular institution and a specific building.

We are all aware of the difficulties and limitations to achieve a proper cleaning project; it is also known that this project will be improved over the years. The preceding paragraph was not written with an idealistic vision, disconnected from the practical reality. It is perfectly possible and desirable to innovate in this direction already, without having to wait for big occasions. It is true that, in a first contract, the detailing of routines and the accuracy of the productivity parameters are not perfect, and therefore there will be some contractual setbacks to readjust them, which is natural in any change. Over time, the administration will gain the necessary expertise.

We must acknowledge the inexperience and take the first step. If we had not blindly followed the IN 18/1997 and its subsequent editions over the past 20 years or so, the public administration would have now another skill level in the subject; so it is essential to recover the lost time, find the path for continuous improvement, invest in projects for innovative cleaning solutions, recognize the limitations and seek alternatives to overcome them.

As mentioned above, the second issue is establishing minimum quantities in the proposals as classification criteria in the bid. This seems more difficult to overcome at a first stage of coping with this situation, precisely because there are no objective data and minimum indicators with necessary levels of detail to assess the feasibility of the proposals. It is thought that in the long run if the administration starts to effectively create cleaning services projects, this scenario will change. For now, recognizing the fragility of the situation, it is considered foolhardy to suggest that we simply do not set the minimum structure, as required, for bidding. However, after the stage of selection of service provider and the enforcement of the contract, there is much to be gained from the change of attitude in public administration in this regard. Therefore, it is mandatory that, at first, we separate very well the object of procurement: a) cleaning services, from its means: b) people, materials, equipment and business management.

7. FOCUS ON RESULTS

The first paradigm to be broken is that overseeing the contract means to control people or any of the means used by the company to provide the service. The service supervisors need to get rid of the "man-badge" model according to which the absence of an employee, if not promptly replaced, generates a reprimand. To point out how uneconomic the situation can so often be: companies keep spare employees at customer sites in order to be able to quickly cope with any absence and avoid discounts. In the end, the public administration unnecessarily pays for these extra personnel, just to maintain a rule that does not help anyone and is even questionable (irregular outsourcing, see Rulings of the Federal Court of Accounts, TCU 1.002/15, 3.489/14 and 1.391/14, all from the Plenary). Actually, cleaning services are not urgent, and do not generate great trouble if delayed by an hour or two. In fact, they are essential and very important, but in the absence of an employee, the company can redesign how tasks are performed on that day, resetting the priorities, granting productivity bonus to an employee who takes responsibility for more than one sector at a given time, it can pay exceptional overtime remuneration for an employee to cover the absent one; it can add a device, it can agree with management to reschedule the routine procedures to an alternate time, that is, there are several possible solutions to the absence of an employee in order to preserve the contract object.

Therefore, if by any of these means, the company makes arrangements and there is no prejudice to the expected results, there is no room for the administration to cancel an item, because doing so would mean breaking the contractual rules. In addition, it would not be proper to solemnize the principles of supremacy of public interest and the non-availability of the public interest by administration to impose such oppression to the company.

It is important to point out that we do not forget the labor (subsidiary) and social security (joint) responsibilities of administration in relation to outsourcing, which requires a supervisory focus on the employees of the company. To reassure the most conservative minds, we must just state this: one thing has nothing to do with the other. All employees working for the company at the contracting party premises should be registered and have their labor and social security rights assured. However, the control of the attendance of each one is up to the service provider. However, the administration cannot allow that non-registered employees work at its facilities.

In this same vein, it is essential to give the service provider the possibility to change the structure initially planned to perform the services. Of course, the company, after three or four months of contract execution, since the cleaning services are repetitive, will have new perspectives on the implementation and can reset routines, contemplate new equipment and materials, increasing productivity and efficiency. And thus, it is very likely that one can reduce the personnel allocated.

For this to actually happen, the company needs to have an incentive. Earnings from increased efficiency and innovation should benefit them in some way; in practical terms, reducing the quantity of people allocated to the contract should not give rise to a contractual adjustment, for suppression of their costs. We must implement the gain-sharing model or contracting based on performance, as it has been the practice of government agencies in the United States for many years[2]. Note that these changes boil down to the means used by companies to fulfill the object, but the object remains untouched – so, it does not make sense to discuss an amendment for qualitative change or quantitative suppression in the contract object.

As a rule, it is also not reason for a contract review, with a view to restoring the economic and financial balance. The grounds for granting the rebalancing is the occurrence of an event of extraordinary economic implications that significantly affects the execution of the contract. Indeed, it has been noted that this should not be a way for ill-intended managers to project clearly anti-economic situations during the planning of recruitment and, subsequently, the cost reduction to appear as a merit of the company, which was precisely addressed by the Federal Court of Accounts, in the TCU Ruling 826/2013 - Plenary. The condition for the practical application of what is intended here is the proper planning of procurement; precise and streamlined design of the quantities, considering the best prospects envisioned at the time.

We recognize the possibility of undue capital allocations by companies in a given period. It is a risk which actually exists, but that needs to be controlled. In fact, considering that, as a rule, contracts last for 12 months, , even if any companies in bad faith attempt to overbill, they will able to do so for a short period. That means: assuming that at the end of the 4th month the company decides to decrease by 20% its quantities and that is able to do so without any increase in equipment costs, materials, or with its own work force (by increasing wages, for example). In this case, in theory, the company was improperly billing those 20% from the quantity of work force. Let us also consider that in such a situation, there has been no drop in quality, and services continued to be satisfactory, in short, that the decrease did not affect negatively the contracted services. Therefore, there was no reason for the administration to sanction the outsourced company for failures in services. So, in theory, the company will earn, "unduly", for just 8 months (we can call, without fear, this "just eight months," considering that the waste with contracts of this nature has been happening, at least, since the issue of IN MARE 18/1997, almost 20 years ago). At the end of these 8 months, the administration will have internalized the company's practices, the applied technologies and, most importantly, they will know how many people can execute the contract.

Again, even if there is the much-feared marginal gain for the company, which was already stressed out, it is a fairly low risk, and at the end of the process the benefits that the administration may reap will be infinitely higher.

8. SERVICE LEVEL AGREEMENT

As a last remark, and without any intention to delve into the subject, since it itself calls for a specific study, the proposed contractual management strategy in the last paragraphs requires a high-level results evaluation system.

As mentioned, the target of the supervision goes from people to the results of the services provided. Therefore, it is essential that in the procurement-planning phase a Service Level Agreement – SLA is prepared, to be included in the public bid, and able to effectively manage the contract by results, imposing variable remuneration, bonuses or discounts depending on the degree of achievement of the agreed goals. The control environment marked by an SLA is what will ensure the maintenance of the quality of services and will bind all the changes in structure that the company may imagine. This, for example, will just reduce the quantity of people up to a limit, and this limit will be given by the SLA, based on results, and not on the means used by the company.

9. CONCLUSION

The stagnation scenario in developing techniques for the design of cleaning services solutions that has endured for nearly 20 years must give way to specialization. In the market there are several options, techniques, technologies, materials, and finally, there is a huge range of factors that arise and change every day, and that interfere in the design of services, and it is not reasonable to apply generic productivity indices which are now outdated.

Moreover, the legal framework for public procurement, including case law, must evolve to control results, investing in ways to define and verify the achievement of goals, so that the object of procurement is guaranteed by end controls and not by counting the means used.

We must innovate, start a propositional win-win model, controlling the risks and deviations, of course, but especially aiming at gains in efficiency, reduced waste of resources, continuous improvement, sharing knowledge and improvement. It is worth remembering that the purpose of public procurement is meeting a need that somehow addresses a public interest. In addition, the manager in charge of procurement planning should always seek, among the available alternatives, the one that, in view of this need, results in lower costs for the administration.

NOTAS

1 Item 4.3.1 of IN MARE 18/1997.

2 In 1981, the GAO recommended to the US government: Stop setting minimum hours (team), as this removes the incentive for companies to increase productivity and save on working time - (GSA's Cleaning Costs Are Needlessly Higher Than in the Private Sector AFMD-81-78: Published: Aug 24, 1981. Publicly Released: Aug 24, 1981).

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