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Implementation of the e-Special Accountability Audit System from the Perspective of Federal Government Accountants

ABSTRACT

Objective: This research aims to analyze the perception of accounting professionals from Brazilian Federal Universities about the effectiveness of the e -TCE system in Special Accountability Audits.

Method: Insights from Institutional Theory were used based on the perception of accountants from Federal Universities. Data were collected through an objective electronic questionnaire (survey), with a sample that covered 82 % of these professionals. Descriptive and bivariate association analyses were conducted. Data were analyzed through Multiple Correspondence Analysis.

Originality/Relevance: The study is original because it is the first to analyze the effectiveness of the e -TCE system and the data analyzed from the perspective of civil servants. Other studies commonly analyze this effectiveness from the perspective of citizens.

Results: The results revealed that the expected benefits with the implementation of the e -TCE system are being achieved. The greatest contribution was the objectivity in the internal formalization flow of the Special Accountability Audit, with 70 % of respondents agreeing that the functionalities developed facilitate the insertion of accountability information, helping to identify essential elements and adding quality to the processes.

Theoretical/Methodological Contributions: This research contributes to the understanding of how the e -TCE system promotes improvements in the workflow of the Special Accountability Audit, and optimizes public management with the use of ICTs. Additionally, it advances Institutional Theory by suggesting that the implementation computerized systems can be seen as a process of institutionalization of new organizational practices, replacing traditional and less efficient methods.

Keywords: Electronic government,Accountability, Special Acountability Audit, e -TCE System.

Ana Paula de Moraes
Federal University of Goiás – UFG, Goiás, Brasil
paula_moraes@discente.ufg.br

Mario Ernesto Piscoya Diaz
Federal University of Goiás – UFG, Goiás, Brasil
mpiscoya@ufg.br

Abimael de Jesus Barros
University of Brasilia - UNB, Distrito Federal, Brasil
acosta@unb.br

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1 INTRODUCTION

The end of the 20th century was marked by profound global changes, with technological advances standing out (Akour & Alenezi, 2022; Santos, 2021). In this scenario, the State is challenged to adopt electronic systems to replace traditional methods, aiming to increase the efficiency of its processes (Al-Zahrani, 2020; Gil-Garcia & Flores-Zúñiga, 2020; Murungi & Kavigamba, 2015; Sousa & Arruda, 2020).

This transition is supported by Institutional Theory, widely recognized for explaining the process of organizational legitimacy and patterns of change (Soeiro & Wanderley, 2019). According to Tolbert and Zucker (1999), the Theory emphasizes how rules and conventions shape the behavior of organizations and society in general. Meyer and Rowan (1977) and DiMaggio and Powell (1983) also contribute to understanding how institutions influence the adoption of new organizational practices.

To achieve effectiveness in the management of economic resources, it is essential to strengthen monitoring methods (Blonski et al., 2017; Pinho & Rodrigues, 2020). In this sense, the Government Comptroller's Office plays an essential role in implementing information systems that improve transparency and control of decision-making activities (Pereira, 1999; Slomski, 2005, p. 15; Slomski, 2007).

The need for accountability is a central principle that guides good governance in the public sector, as defined by the International Federation of Accountants (IFAC, 2001), which highlights the responsibility of public managers for the appropriate use of resources and transparency in organizational processes (Dall'Agnol et al., 2017). In the Brazilian context, the Federal Court of Accounts (*Tribunal de Contas da União* - TCU) plays a fundamental role in the monitoring and management of public resources, including the Special Accountability Audit (*Tomada de Contas Especial* - TCE) (Arraes et al., 2019; Speck, 2000).

Previous research in the context of the TCE has shown that the manual system is no longer adequate, due to the volume and slowness of processing, causing inefficiency in the effectiveness of the TCE (Quintão & Cordeiro, 2015; Oliveira, 2017; Pacheco, 2021). Coelho's research (2021) evaluated the effectiveness of the TCE in the municipalities of northern fluminense from 2015 to 2020, finding administrative errors that compromised the TCE process. Approximately 6.44 % of the amounts questioned by the TCE/RJ (in the state of Rio de Janeiro, RJ), totaling R$37,515,797.07, could not be settled due to lost documents, highlighting the need for improvements in the management of these processes.

In order to improve control, the TCU, the Ministry of Transparency and the Office of the Comptroller General of Brazil (*Controladoria-Geral da União* - CGU) collaborated in the implementation of the Special Accountability Audit Computerized System (*Sistema Informatizado de Tomada de Contas Especial* - e-TCE). In accordance with TCU Normative Instruction No. 122, of July 1, 2018, the initiation of Special Accountability Audits will be carried out exclusively electronically in this system.

Despite the existence of a government proposal for digital transformation, there are indicators that point to challenges in implementing these strategies (Viana, 2021). Given the above, this research seeks to answer the following question: What is the perception of accounting professionals at Brazilian Federal Universities regarding the effectiveness of the eTCE system in Special Accountability Audits?

To fill the gaps found in the existing literature, the data is analyzed from the perspective of civil servants, differing from other studies that evaluate from the perspective of citizens (Bandeira, 2022; Samuel et al., 2020). Recognizing the relevance of contributing to the improvement of public administration processes, this research also seeks to contribute to the existing body of literature by exploring the perspective of civil servants. The analysis seeks to

promote more transparent and cohesive information, aligned with the principles of governance and accountability (Castro & Costa, 2022; Melati & Janissek-Muniz, 2020).

2 LITERATURE REVIEW

2.1 Government Comptrollership and Electronic Government in Light of Institutional Theory

Comptrollership can be defined as "the pursuit of achieving the optimum in any entity, whether public or private" (Slomski, 2005, p. 37). It acts in the decision-making process, in information, in the control of activities, and in the security of public assets (Pereira, 1999; Quintão & Cordeiro, 2015). In the Brazilian governmental context, Comptrollership gained prominence in the 1970s and was formalized by the Federal Constitution of 1988 and by Complementary Law No. 101/2000 (LRF), integrating the strategic organizational structure.

The performance of external control bodies, such as the Brazilian Federal Court of Accounts (TCU), is essential to ensure the effectiveness of public administration actions, auditing and monitoring entities with public resources (Sundfeld et al., 2017). In this context, the integration of digital technologies has promoted new dynamics in the relationship between state and society (Twizeyimana & Andersson, 2019), contributing to the transparency and efficiency of public services (Androniceanu, 2021; Cunha & Miranda, 2013; Sampaio et al., 2012).

The introduction of the first electronic services into public administration occurred in the late 1980s, with a progressive adoption of Information and Communication Technologies (ICTs) from the 1990s onwards as part of government public policies, covering a global perspective (Cristóvam et al., 2020; Reck, 2021). According to Institutional Theory, which examines organizational legitimacy and institutional change processes, e-government represents a modernization in public administration through ICTs and the continuous search for

process improvement (Osborne & Plastrik, 1997; Dias et al., 2019). Kraemer and King (2006) argue that this theory is appropriate for understanding how e-government legitimizes itself and adapts to social and technological demands.

As highlighted by North (1990), the concept of institutional change manifests itself through incremental processes, in which marginal adjustments are made to the complex norms, rules, and impositions that constitute the institutional structure, without institutional rupture occurring. In this context, coercive isomorphism applies to research, since the implementation of electronic systems such as e-TCE and other information technologies occurs largely due to regulatory pressures and government policies. Regulation by the TCU and the adoption of new policies require public institutions to implement these systems to ensure compliance, efficiency, and transparency (DiMaggio & Powell, 1983).

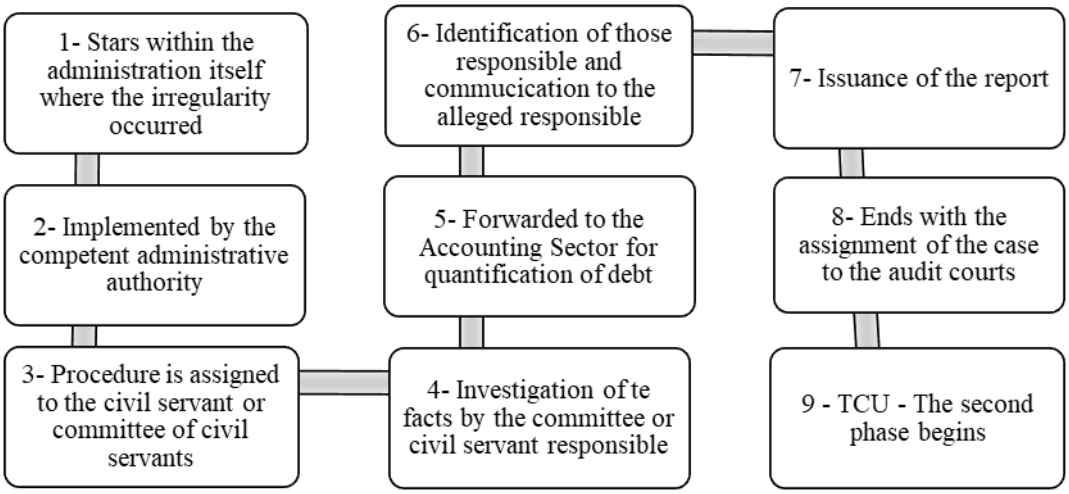
2.2 Electronic Special Accountability Audit System (e-TCE)

The Special Accountability Audit (*Tomada de Contas Especial* - TCE) is an administrative procedure established by Law No. 8,443/92 (Organic Law of the TCU) to investigate, on an exceptional basis, damages to the public administration and compensate the public treasury. The TCE is regulated by TCU Normative Instruction No. 71 of 2012, updated by TCU Normative Decision No. 155 of 2016. The process of establishing the TCE has two phases, the internal phase and the external phase (Law No. 8,443 of 1992). The internal phase, the subject of this research, is presented in Figure 1.

The first phase of the TCE begins in the department where the damage to the public treasury occurred and is conducted by the competent administrative authority. A civil servant or committee of civil servants investigates the facts, identifies those responsible, quantifies the damage and prepares the accountant's report (Almeida, 2017). This research focuses on the first phase, highlighting the responsibilities of the accounting sector, as shown in Figure 2.

Figure 1

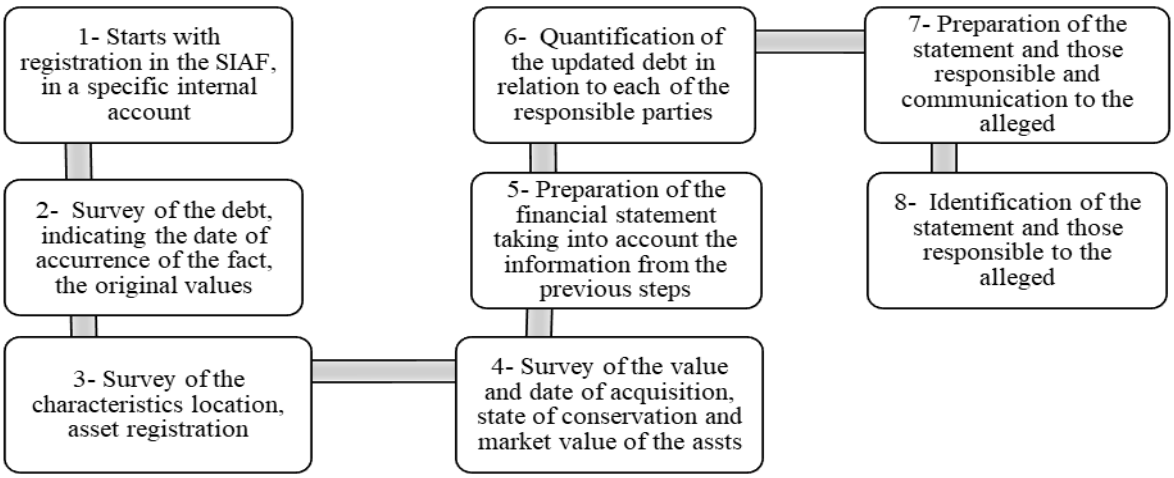
Internal phase of establishing a Special Accountability Audit



Source: Adapted from IN/TCU nº 71/2012.

Figure 2

Responsibilities of the accounting sector



Source: Adapted from Law No. 9,755/1998.

The accounting department's responsibilities include recording the fact in the Federal Government's Integrated Financial Administration System (*Sistema Integrado de Administração Financeira do Governo Federal* - SIAFI), with date and values, surveying the characteristics and values of the assets, and identifying the person(s) responsible for the debt

(Law No. 9,755/1968). As of July 1, 2021, Ordinance No. 1,531 provides technical guidance for the internal phase of the TCE. It is worth noting that during the process of preparing the TCE process, the role of the accountant is fundamental, as he or she is responsible for properly quantifying the debt.

After ascertaining the facts, quantifying the debt, identifying those responsible, and analyzing the justifications, the accountant or committee issues a conclusive and detailed report. The process is then forwarded to the competent sectors for Internal Control procedures. The second phase takes place at the Federal Court of Accounts (TCU), where the process is judged (Brasil, 2021). The second phase is specifically developed at the Federal Court of Accounts (TCU) and essentially consists of the trial of the case.

Thus, the electronic system for Special Accountability Audits (e-TCE) is a virtual environment that facilitates the initiation, processing, and filing of TCE cases, in addition to the registration of debts. The e-TCE modernizes and standardizes the process of restitution of damages to the public treasury, representing a change in institutional culture.

Therefore, aiming to improve the management of the Special Accountability Audit process, through an integrated view of the TCE process flow and its developments, agents can now monitor the case from its initiation to its judgment at the TCU, avoiding wasting time on manual searches to check its progress.

3 METHODOLOGICAL PROCEDURES

3.1 Research Characterization

This study is classified, in terms of its objective, as descriptive, with a quantitative approach. Regarding the technical procedures for collecting the data to be treated in the research, an objective questionnaire (survey) was applied electronically. Ethical considerations were followed.

Each participant was duly informed about the purpose of the research and the possible risks involved. Considering that this is questionnaire research (survey), the only risk identified is the potential embarrassment when answering a question. In these cases, participants were free to skip the question or, if necessary, end their participation. In addition, participants were assured that their identification would be removed from the database, ensuring that the analysis would be conducted anonymously.

Regarding the control of variables by the researcher, the *ex post facto* approach was chosen. Regarding the temporal dimension, the analysis was conducted cross-sectionally, covering the period from January to May 2023.

3.2 Target Population and Sample

The target population of this research is made up of all civil servants who perform the role of accountant in 69 Federal Universities linked to the Ministry of Education in 2023 and who are directly related to the use of the e-TCE system in Special Accountability Audits. To determine the size of the population, data available at the National Forum of Accounting and Finance Directors of Brazilian Federal Universities (*Fórum Nacional dos Diretores de Contabilidade e Finanças* - FONDCF) were used. The sample was confirmed by 57 accountants who responded online to the structured questionnaire with 17 questions, representing 83 % of the population.

To identify possible flaws in the preparation of the questionnaire, pilot tests were carried out to verify the wording and understanding of each of the 17 questions. Thus, the data collection instrument was submitted to the pre-test phase, with two accountants responsible for different Federal Higher Education Institutions, members of the target population of this research, as evaluators. The results of this pre-test showed total agreement between both

evaluators in all the analyzed items, thus there was no need to make adjustments to the collection instrument.

3.3 Variables Considered

To derive the variables in the methodology, the essential components for the development of the questionnaire were prepared according to the benefits expected in the implementation of the e-TCE system, as proposed by Ordinance No. 122/2018 of the TCU. These components are detailed in Table 1.

Table 1

Benefits expected from the implementation of the system

(I) Data quality and integrity	(V) Streamlining and speed.
(II) Integration with the Siafi/Siconv system databases.	(VI) Integrated view of the TCE process flow and its developments.
(III) Information and feedback on public policy.	(VII) Identification of debts arising from the application of art. 6, items I and II, of IN TCU 71/2012 and coordination of actions developed by the TCU and CGU based on the relevant records and documents.
(IV) Objectivity in accountability.	

Note: Adapted from Ordinance No. 122/2018.

The data collection instrument consisted of 17 objective questions. The first six questions collect sociodemographic and professional experience information. Questions from 7 to 10 aim to evaluate the use of the e-TCE system and, in case of use, were offered technical support to use the system, while questions 11 to 17 capture the perception of the interviewee regarding the benefits arising from the implementation of the e-TCE system, through an ordinal 5-point Likert scale, as shown in Figure 3.

Figure 3

Five-point scale

Note: Adapted from Likert (1932)

The categories considered are represented by natural numbers between 1 and 5, in which 1 represents the category 'totally disagree'; 2 represents the category 'disagree'; 3 represents the category 'neither agree nor disagree'; 4 represents the 'agree' category and finally 5 represents the 'totally agree' category. A more detailed description of the questionnaire can be found in the appendix of this work.

3.4 Association Analysis

To measure the association of variables it was necessary to build contingency tables. From them, the Cramer V Association Coefficient (Agresti & Finlay, 2009) is calculated, defined by the following equation:

$$V = \sqrt{\frac{\chi^2/n}{min\{k-1; r-1\}}}$$

Where □2 represents the Chi-Square statistic calculated from the observed and expected frequencies of the contingency table; *k* represents the number of columns and *r* the number of rows in that table. Stata ® 14 software was used to analyze the data.

A limitation of association statistics for categorized data is the difficulty in showing how the categories of one of the variables involved in the analysis relate to the categories of the other (assuming a contingency table constructed for a variable with *r* categories and another with *k* categories). An alternative technique that allows for better visualization of the proximity between the categories of a set of categorical variables is Multiple Correspondence Analysis (Greenace & Blasius, 2006).

This technique reduces the size of a contingency table through a series of transformations that produce related data that can be presented graphically using perception maps (Beh & Lombardo, 2014). The interpretation of these graphs is quite intuitive, since the closer the values of the categories of the variables involved, the greater the association between

these categories. In this way, it is possible to verify how the characteristics of each individual are associated with their corresponding responses.

4 PRESENTATION OF RESULT

4.1 Sample Characteristics

A total of 58 responses were collected, of which only one did not cover all the questions answered, which consequently excluded it from the sample. The remaining participants provided responses to all items, totaling 57 valid cases, which represents 82 % of the total population.

This section presents the associative analysis of the responses to questions 1 to 3 of the questionnaire. Table 2 shows the distribution of the different sociodemographic characteristics (sex, age, and education) and their relationship with the use of the e-TCE System by accountants at Federal Universities.

Table 2

Distribution of the 57 participants according to the use of the e-TCE system and different characteristics.

	Use of the e-TCE system?				**Total**		**P[1] value**
	No		Yes				
	N	%	N	%	N	%	
1- **Sex**							0.197
Female	2	10.0%	18	90.0%	20	100.0%	
Male	14	37.8%	23	62.2%	37	100.0%	
2- **Age**							0.004
Up to 30 years	2	12.5%	14	87.5%	16	100.0%	
31 to 40 years	8	42.1%	11	57.9%	19	100.0%	
41 to 50 years	4	36.4%	7	63.6%	11	100.0%	
Over 50 years	2	18.2%	9	81.8%	11	100.0%	
3- **Education**							0.006
Undergraduate	4	14.3%	24	85.7%	28	100.0%	
Specialization	5	27.8%	13	72.2%	18	100.0%	
Master's	7	70.0%	3	30.0%	10	100.0%	

Note: The P[1] value is associated with the Chi-Square test of association.

When analyzing the demographic profile, it is clear that most respondents are male, consisting of individuals between 31 and 40 years old. Regarding the level of education, it was observed that the public had a high school or higher education level and an income level of up to three minimum wages. Regarding academic background, almost half of the interviewees (49 %) stated that they had completed an undergraduate degree and 32 % stated that they had taken some specialization course.

It is observed that the use of the e-TCE system is greater among women (90 %) when compared to the men interviewed (62.2 %). Regarding age, of the total number of interviewees up to 30 years old, 87.5 % used the system. In total, it is observed that approximately 8 out of every 10 interviewees (81.8 %) used the system.

The percentage of use of the e-TCE was lower among interviewees between 31 and 40 years old (57.9 %) and those between 41 and 50 years old (63.6 %). It was possible to observe the existence of a statistical association between age and use of the system (p-value = 0.004). Regarding education, it was observed that 85.7 % of the interviewees with undergraduate degrees had had some type of contact with e-TCE; 72.2 % of the interviewees with specialization degrees, and 30 % of those who also declared having a master's degree (see Table 2). The results obtained suggest a statistical association between education and use of the e-TCE system (p-value = 0.006).

5 DISCUSSIONS OF RESULTS

5.1 Association Analysis

This section presents the analysis according to the association for questions 4 to 7 of the questionnaire, addressing the use of the e-TCE system and the characteristics of the functions performed. The results are presented in Table 3.

Table 3

Distribution of participants according to use of the e-TCE system and characteristics of the function performed.

	No		Yes		Total		P-value
	N	%	N	%	N	%	
4-Experience in Accounting in the Public Sector							0.0006
Up to 5 years	6	18.2%	27	81.8%	33	100.0%	
From 6 to 10 years	5	55.6%	4	44.4%	9	100.0%	
From 11 to 15 years	5	62.5%	3	37.5%	8	100.0%	
More than 15 years	0	0.0%	7	100.0%	7	100.0%	
5-Do you have a complementary in training course Information Technology?							0.007
No	4	33.3%	8	66.7%	12	100.0%	
Yes	12	26.7%	33	73.3%	45	100.0%	
6-Did you work as an accountant before computerization through the e-TCE System?							0.007
No	10	50.0%	10	50.0%	20	100%	
Yes	6	16.2%	31	83.8%	37	100%	
7-Was adequate training provided after the implementation of the e-TCE System?							
No	13	76.9%	3	23.1%	13	100%	
Yes	6	13.6%	38	86.4%	44	100%	

Note: p-value is associated with the Chi-Square test of association.

Questions 11 to 17 sought to capture the interviewee's perception regarding the benefits arising from the implementation of the e-TCE system and were answered exclusively by accountants who used the system for TCE. Thus, a descriptive analysis was performed on variables 11 to 17. Table 4 contains a description of these variables.

Table 4

Description of Expected Objectives

Variable	Totally Disagree	Disagree	Neither agree or disagree	Agree	Totally agree	Total
11.Quality				18 = 44%	23 = 56%	41= 100%
12. Integration				18 = 44%	23 = 56%	41= 100%
13. Management			1 = 2%	17 = 42%	23 = 56%	41= 100%
14. Objectivity				12 = 30%	29 = 70%	41= 100%
15. De-buroeaucratization				17 = 42%	24 = 58%	41= 100%
16. Vision				16 = 39%	25 = 61%	41= 100%
17. Debts			4 = 0.10%	10 = 24%	27 = 66%	41= 100%

Of the 57 survey participants, 41 answered the questions related to the objectives of the e-TCE system program. Regarding the quality and integration of data, according to the Likert scale, 44 % agree and 56 % of respondents totally agree, demonstrating that the perception of survey respondents is that the computerization of the Special Accountability Audit, through e-TCE, promotes better communication between internal and external control, being able to make all necessary information available, improving the quality of the process.

The data suggest that the e-TCE system contributes to saving time based on the integration of the SIAFI/Siconv systems.

Most respondents, with a percentage of 56 %, fully agree that the e-TCE system allows the management of data produced by the Special Accountability Audits set, promoting improvements in the formulation and execution of public policy. By allowing standardized procedures and documents, it ensures that all processes follow the same guidelines and formats, facilitating comparative analysis, ensuring greater consistency in TCU evaluations. Only 2 % of respondents did not agree or disagree with this statement.

With a percentage of 70 %, individuals in the sample agree that the developed features allow greater objectivity in the insertion of information regarding accountability, subsidizing

the establishment in identifying the elements that must be present in the Special Accountability Audit, adding quality to the process. Thus, the information is available, allowing quick access to relevant documents and data and facilitating the work of those involved in the process, as well as enabling more transparent monitoring by the supervisory agencies and interested citizens.

Regarding de-bureaucratization, 58 % of respondents answered that the e-TCE system contributes to the conclusion of the work concerning the accounting sector, the process is automatically available to the next sector or body. In addition, 61 % indicated that the integrated view of the flow of processing the Special Accountability Audit process and its consequences allows agents to follow the process from the establishment to their trial in the TCU, avoiding time expenditure with manual research for verification of their progress. Thus, the integration of the e-TCE system allows the exchange of information more efficiently and avoids the duplication of efforts, enabling a more complete and comprehensive analysis, with direct access to relevant information.

Above average, with the percentage of 66 %, the perceptions of the research participants showed that the e-TCE system contributes to identify the due debts arising from the establishment of Special Accountability Audits, assisting in consistent decision making. Only 10 % of respondents expressed not agreeing or disagreeing with this statement.

According to these results, in general, the objectives set forth with the implementation of the e-TCE system are being achieved. The main contribution of the system to the internal formalization flow of the Special Accountability Audit was the agility, data quality, and integration provided by the system, demonstrating that the greatest contribution that the eTCE system brought to the internal formalization flow of the Special Accountability Audit was the agility of the system, data quality, and integration.

In this sense, the results of the analyses corroborate those of the research by Reis,

Dacorso & Tenório (2015) and Sousa and Arruda (2020) on the adoption of technologies in Accounting Courts, since the authors proved that there were improvements in the public accountability process through agility and de-bureaucratization, contributing to the efficiency of the government comptroller's office.

5.2 Response Profile of Respondents Who Used e-TCE

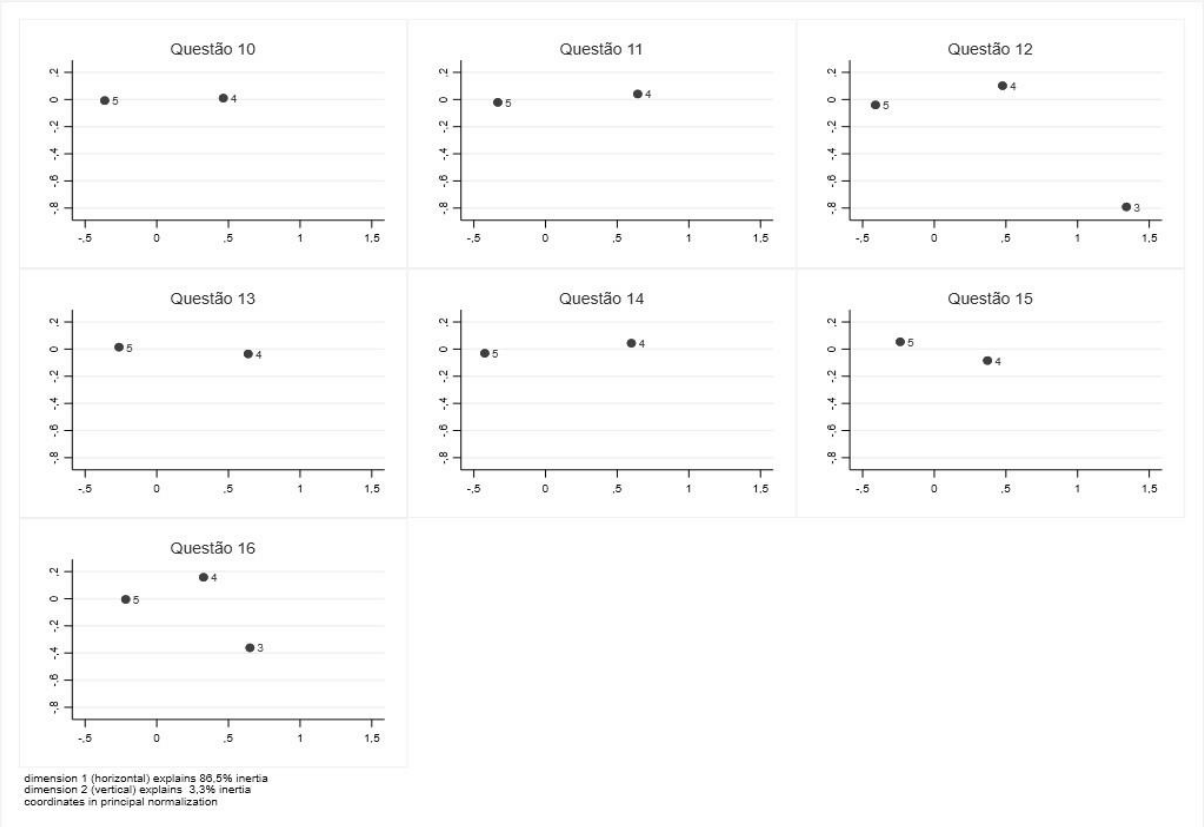
5.2.1 Multiple Correspondence Analysis

After performing a multiple correspondence analysis considering questions 10 to 16 together for those participants who had some contact with the e-TCE system, the results of this analysis are presented in Figure 4. The inertia represented by the two dimensions retained corresponds to approximately 90 % of the total inertia. It is observed that the response profile in questions 10, 11, 13, 14, and 15 are quite similar among the respondents who jointly evaluated these items with scores of 4 or 5. It is also possible to observe that questions 12 and 16 present a different response pattern compared to the remaining questions. This pattern is characterized by the presence of three categories instead of two in the respondents' responses.

When analyzing question 12 (In your perception, does the e-TCE System contribute to saving time based on the integration of the SIAFI/Siconv systems with structuring administration systems?), it is observed that participants with a maximum level of education of undergraduate or specialization are more likely to fully agree with the inquiry proposed in the question. Participants with a master's degree are more likely to only agree with the proposed question. Regarding age, participants over 50 years old show a greater association with full agreement in question 12. In turn, participants up to 30 years old and participants between 41 and 50 years old show a greater association with agreement in this question.

Figure 4

Multiple correspondence analysis for questions 10 to 16



Note: "Question 10: n your opinion, does the computerization of the Special Accountability Audit through eTCE promote better communication between internal and external control, capable of providing all necessary information, improving the quality of the process?; Question 11. In your opinion, does the e-TCE System contribute to saving time based on the integration of the Siafi/Siconv systems with structuring systems of the administration?; Question 12: In your opinion, does the e-TCE system allow the management of data produced by the set of Special Accountability Audits (reports and indicators that could be used as an instrument for improving the formulation and execution of public policy)?; Question 13. In your opinion, do the functionalities developed allow greater objectivity in the insertion of information regarding accountability (irregularity, responsible party, conduct, damage), supporting the initiator in identifying the elements that must be present in the Special Accountability Audit, adding quality to the process?; Question 14. Does the e-TCE System help to ensure that, after the accounting department's work is completed, the process is automatically made available to the next department or agency?; Question 15. In your opinion, does the integrated view of the Special Accountability Audit process flow and its developments allow agents to monitor the process from its initiation to its judgment at the TCU, avoiding wasting time on manual searches to check its progress?; and Question 16. In your opinion, does the e-TCE System help to identify the resulting debts that are exempt from the initiation of the Special Accountability Audit (application of art. 6, items I and II, of TCU IN 71/2012)?". Source: Prepared based on data collected by researchers.

In relation to experience in the role performed, it is observed that the answers of participants with less experience (up to 5 years) are closer to full agreement. Participants with 6 to 10 years of experience, as well as participants with more than 15 years of experience, have responses that are more associated with agreement in relation to question 12. The responses of

participants with 11 to 15 years of experience show a greater association with the category 'neither agree nor disagree' in this question. This topic is important, as it allows us to verify the participants' perception in relation to integration, as shown in Figure 5.

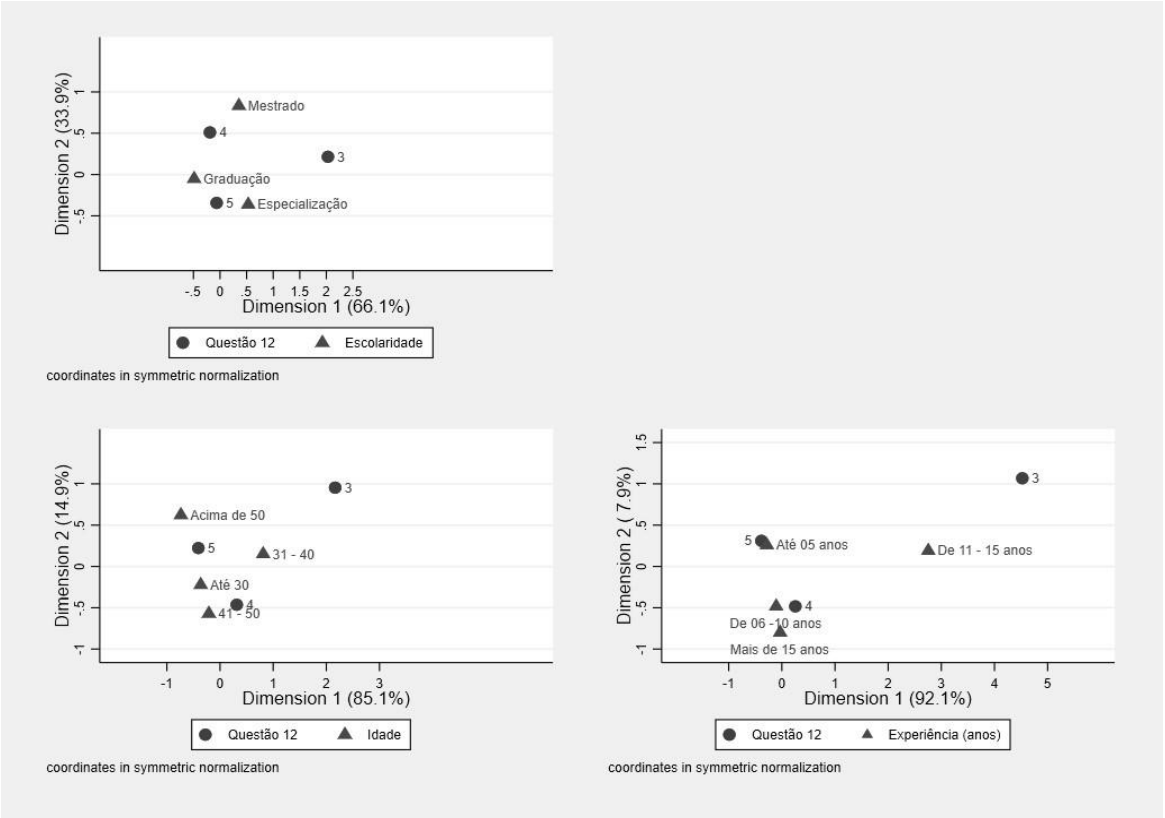
Regarding question 16, prepared with the purpose of analyzing the integrated view of the TCE process flow and its developments, we present in Figure 6 an analysis of correspondences between the categories of the variables maximum education, age, and experience in the role (in years). It can be seen in the figure that participants with a bachelor's degree show a tendency to fully agree with the proposed question, while participants with a specialization are more likely to only agree with the statement proposed in this question. In turn, participants with a master's degree are unable to position themselves in relation to the question.

Regarding question 16, prepared with the purpose of analyzing the integrated view of the TCE process flow and its developments, we present in Figure 6 an analysis of correspondences between the categories of the variables maximum education, age, and experience in the role (in years). It can be seen in the figure that participants with a bachelor's degree show a tendency to fully agree with the proposed question, while participants with a specialization are more likely to only agree with the statement proposed in this question. In turn, participants with a master's degree are unable to position themselves in relation to the question.

When considering the feasibility of conducting an association analysis considering different age groups, it is worth noting that the most experienced participants, aged over 50, and the youngest participants, aged up to 30, demonstrate a greater propensity to fully agree with the proposition presented in question 16. Furthermore, participants aged between 41 and 50 express a positive assessment of question 16, although their agreement is more moderate, characterized by simple agreement with the statement.

Figure 5

Results of the correspondence analysis between the categories of question 12 and characteristics such as age, education and experience.



When relating this to the length of experience in the role, it is found that participants with a professional career of between 11 and 15 years reveal greater indecision, and their perception of question 16 is closer to indifference. Participants with up to 5 years of experience demonstrate a greater propensity to exclusively agree with the question presented, while participants with professional experience between 6 and 10 years, as well as those with more than 15 years of experience, show a greater inclination to fully agree with the problem formulated in question 16, as illustrated in Figure 6.

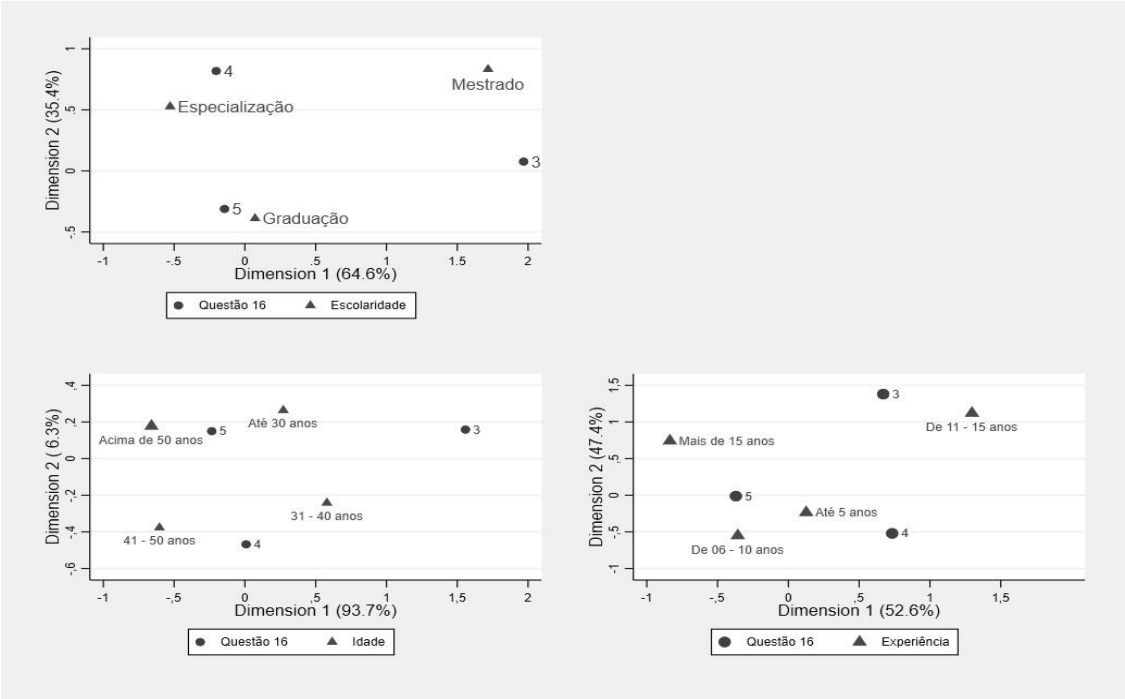
Regarding the level of education, 51.7 % have a bachelor's degree, 32.1 % have a specialization, 13.8 % have a master's degree, and 3.5 % did not answer this question. Regarding experience in accounting in the public sector, 58.6 % have up to five years of experience, 17.2 % have six to ten years, 10.3 % have eleven to fifteen years and 13.8 % have more than fifteen

years of experience. It is observed that 75.9 % of the survey participants have completed a complementary course in information technology, while 24.1 % have not.

Before the implementation of the e-TCE system, 65.5 % already worked as accountants, and 34.5 % did not work in this role. After the implementation of the e-TCE system, 79.3 % of the respondents claimed to have received training to use the system and 20.7 % did not receive such training. Regarding the use of the e-TCE system, 72.4 % responded that they had used the system and, although 27.6 % had not used it, many revealed their reasons, which are: failure to complete the flows for determining TCE within the institutional scope (12.5 %), failure to participate in the Special Accountability Audit (25 %); lack of knowledge of the system (25 %); and the remaining 37.5 % did not reveal the reason.

Figure 6

Results of the correspondence analysis between the categories of question 16 and characteristics such as age, education and experience.



According to these results, in general, the objectives set forth with the implementation of the e-TCE system are being achieved. Regarding the quality and integrity of data, integration with the SIAFI/Siconv system databases, information, feedback on public policy, objectivity in

accountability, streamlining and speed, integrated view of the process flow with its developments, and identification of debts and coordination of actions developed by the TCU and the CGU based on the relevant records and documents, the results are being achieved.

Multiple correspondence analysis revealed that positive perceptions of the e-TCE system are more prevalent among accountants with less experience and those with lower levels of education, while participants with more experience and education tend to be more critical or indecisive. This variation can be interpreted in light of Institutional Theory, which suggests that individuals within organizations are influenced by norms and practices established over time. More experienced professionals may be more familiar with and adapted to traditional processes, leading to greater resistance or criticism toward new technologies. In contrast, those with less experience may perceive the benefits of innovations, such as the eTCE system, more clearly because they are not so tied to previously established practices.

6 FINAL CONSIDERATIONS

This study aimed to analyze the perception of accounting professionals from Brazilian Federal Universities regarding the effectiveness of the Special Accounability Audit e-TCE system, based on the assumptions of Institutional Theory. The results show that in the perception of accountants, the implementation of the e-TCE system has achieved the proposed objectives, demonstrating greater effectiveness in the adoption of the TCE as an instrument of accountability and safeguarding of the public treasury. New technologies, therefore, contribute significantly to development in the public sphere.

The analysis of the data reveals that most respondents agree that the e-TCE system promotes significant improvements in communication between internal and external control bodies, integrates data efficiently, and speeds up the Special Accountability Audit process. According to Institutional Theory, which examines organizational legitimacy and institutional

change processes (Osborne & Plastrik, 1997; Dias et al., 2019), the implementation of the eTCE system can be seen as an effort to legitimize institutions, adapting to social and technological demands to improve transparency and efficiency in public accountability.

The assumptions of Institutional Theory suggest that organizations adopt new practices and technologies in response to external pressures, seeking to understand how egovernment legitimizes itself and adapts to social and technological demands. In this sense, the e-TCE system can be interpreted as an institutional response to these pressures, promoting the modernization and standardization of accounting processes in the Accounts Courts.

As highlighted by North (1990), the concept of institutional change manifests itself through incremental processes, in which marginal adjustments are made to the complex norms, rules and impositions that constitute the institutional structure without institutional rupture occurring. The results of this study indicate that the adoption of the e-TCE system follows this logic of incremental change, improving the quality of TCE processes.

However, some areas for improvement were identified based on the neutral responses and the lower participation of certain profiles. These data may indicate the need to improve the e-TCE system to better meet the needs of all users. The analysis of the neutral responses suggests that some system features may not be sufficiently clear or integrated, generating uncertainty among users. In addition, the lower participation of profiles with greater education and experience indicates the need for adjustments to make the system more intuitive and accessible for these groups.

Therefore, it is recommended that future improvements to the e-TCE system consider these variables, aiming for a more robust system adapted to the needs of all civil servants. The implementation of more specific training and the inclusion of continuous feedback from users may be effective strategies to achieve these objectives. The implementation of computerized

systems can be seen as the institutionalization of new visions in organizational practices, as well as the deinstitutionalization of older practices shaped by traditions.

For future research, it is suggested that similar studies be conducted in other agencies, providing opportunities for comparative analyses based on the limitations identified in this study. It is also recommended that comparative studies be conducted between Brazilian digital services and systems used in other countries, with a view to identifying best practices. It is important to note that the limited samples made it impossible to conduct more in-depth analyses, and the results of this research cannot be generalized.

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APPENDIX – Questionnaire

Description of questions 1 to 3 of the questionnaire

Variable	Question No.	Question
Gender	1	What is your gender?
Age group	2	What is your age group?
Education	3	What is your level of education?

Description of questions 4 to 7 of the questionnaire

Experience	4	Do you have experience in Accounting in the Public Sector? **Complementary course** 5 Have you taken a complementary training course in Information Technology?
Accountant function	6	Did you work as an accountant before the computerization of the e-TCE System?
Training	7	Was adequate training offered after the implementation of the e-TCE System?

Description of questions 8 to 10 of the questionnaire

Use of e-TCE	8	Have you ever used the e-TCE system in your institution? If you have not used the system, describe the reason.
Usability	9	Is the e-TCE System easy to learn and allows good usability by users, allowing them to perform their tasks successfully?
Technical support	10	Is there technical support for operational queries regarding the e-TCE System?

Description of questions 11 to 17 of the questionnaire

Variable	Question No.	Expected objective	Question
Quality	11	Data quality and integrity	In your opinion, does the computerization of the Special Accountability Audit through e-TCE promote better communication between internal and external control, capable of providing all necessary information, improving the quality of the process?
Integration	12	Integration with the SIAFI/Siconv system databases	In your opinion, does the e-TCE system contribute to saving time based on the integration of the SIAFI/Siconv systems with the administration's structuring systems?
Management	13	Information and feedback on public policy	In your opinion, does the e-TCE System allow for the management of data produced by the set of Special Accountability Audits (reports and indicators that could be used as an instrument for improving the formulation and execution of public policy)?
Objectivity	14	Objectivity in accountability	In your opinion, do the functionalities developed allow for greater objectivity in the insertion of information regarding accountability (irregularity, responsible party, conduct, damage), supporting the initiator in identifying the elements that must be present in the Special Accountability Audit, adding quality to the process?

Reduction of bureaucracy	15	Reduction of bureaucracy and speed	Does the e-TCE System contribute to ensuring that, after the completion of the work related to the accounting sector, the process is automatically made available to the next sector or agency?
Vision	16	Integrated view of the process flow of the TCE and its developments	In your opinion does the integrated view of the process flow of the Special Accountability Audit and its development allow agents to follow the process from the establishment to the trial in the TCU, avoiding the time expenditure with manual research to verify its progress?
Debts	17	Identification of debts	In your opinion, does the e-TCE system help to identify debts arising from which special accounts are not required (application of art. 6, items I and II, of IN TCU 71/2012)?

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A Implementação do Sistema e-Tomada de Contas Especiais sob a Perspectiva dos Contadores Governamentais Federais

Ana Paula de Moraes
Universidade Federal de Goiás - UFG, Goiás Brasil
paula_moraes@discente.ufg.br

Mario Ernesto Piscoya Diaz
Universidade Federal de Goiás - UFG, Goiás, Brasil
mpiscoya@ufg.br

Abimael de Jesus Barros
Universidade de Brasília – UNB, Distrito Federal, Brasil
acosta@unb.br

RESUMO

Objetivo *: Esta pesquisa tem como objetivo analisar a percepção dos profissionais de contabilidade das Universidades Federais brasileiras sobre a efetividade do sistema e -TCE nas Tomadas de Contas Especiais.*

Método: *Utilizaram-se insights da Teoria Institucional baseados na percepção dos contadores das Universidades Federais. Os dados foram coletados por meio de um questionário eletrônico objetivo (survey), com uma amostra que abrangeu 82% desses profissionais. Foram conduzidas análises descritivas e de associação bivariada. Os dados foram analisados por meio da Análise de Correspondências Múltiplas.*

Originalidade/Relevância: *O estudo é original por ser o primeiro a analisar a efetividade do sistema e -TCE e os dados analisados sob a ótica de servidores. Outras pesquisas comumente analisam essa efetividade pela perspectiva do cidadão.*

Resultados: *Os resultados revelaram que os benefícios esperados com a implantação do sistema e -TCE estão sendo alcançados. A maior contribuição A maior contribuição foi a objetividade no fluxo de formalização interna da Tomada de Contas Especial, com 70% dos respondentes concordando que as funcionalidades desenvolvidas facilitam a inserção das informações de responsabilização, auxiliando na identificação dos elementos essenciais e agregando qualidade aos processos.*

Contribuições Teóricas/Metodológicas*: Esta pesquisa contribui para a compreensão de como o sistema e -TCE promove melhorias no fluxo de trabalho das Tomadas de Contas Especiais, e otimiza a gestão pública com o uso de TICs. Adicionalmente, avança na Teoria Institucional ao sugerir que a implantação de sistemas informatizados pode ser vista como um processo de institucionalização de novas práticas organizacionais, substituindo métodos tradicionais e menos eficientes.*

Palavras -chave*: Governo eletrônico, Prestação de Contas, Tomada de Contas Especiais, Sistema e -TCE.*

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