

Costs Systems: Relevance, Feasibility And Usefulness According To Public Officials In The State Of Paraná (Brazil)

Abstract

The aim in this study is to get to know the level of understanding and adoption of cost systems in cities in the State of Paraná. A descriptive study with a qualitative approach was undertaken. Data were collected through the application of a questionnaire in 67 cities in the State of Paraná. Descriptive analysis was used and Spearman's correlation coefficient was applied to achieve the research objective. Among the study results, the following stand out: the incipient nature of knowledge about the relevance, feasibility and usefulness of a cost system; resulting from public officials' limited knowledge, mainly about topics related to the budgetary and financial feasibility of adopting cost systems; an environment for the cost system, implemented costs systems and operating systems; although the answers obtained to proposals about cost information and control were significantly coherent.

Key words: Cost System. Cost Accounting. Public Sector.

Luciane Maria Gonçalves Franco

M.Sc. in Accounting (UFPR) and Ph.D. candidate in Urban Management (PUCPR), External Control Analysis at the Paraná State Court of Auditors. **Contact:** Praça N. Sra da Salete, s/nº, Centro Cívico, Curitiba, PR, Brazil, CEP: 80530-912.
E-mail: lutc@tce.pr.gov.br

Cristiano do Nascimento

M.Sc. in Accounting (UFPR)
E-mail: cristiano.nascimento.cont@gmail.com

Márcia Maria dos Santos Bortolucci Espejo

Ph.D. in Controllershship and Accounting (FEA/USP), Professor and Coordinator at Universidade Federal do Paraná (UFPR). **Contact:** Av. Prof. Lothário Meissner, 632, Jardim Botânico, Curitiba, PR, Brazil, CEP: 80210-170.
E-mail: marciabortolucci@ufpr.br

Simone Bernardes Voese

Ph.D. in Production Engineering (UFSC), Professor and Coordinator at Universidade Federal do Paraná (UFPR). **Contact:** Av. Prof. Lothário Meissner, 632, Jardim Botânico, Curitiba, PR, Brazil, CEP: 80210-170.
E-mail: simone.voese@gmail.com

1. Introduction

Brazilian public management, like in different developed countries, has gone through different reforms (Di Giacomo, 2005), aimed at promoting the overcoming of bureaucratic models and at incorporating management techniques and notions of quality, productivity, feasible results and accountability (Pereira, 1998). The first countries to adhere to State management reforms were the United Kingdom, Australia and New Zealand (Dias, Gondrige, Clamente, Espejo & Voese, 2009). “*The New Public Management*” was a term coined in the 1980’s to designate the new form of public management that was aimed at incorporating experiences from the private sector by professionalization efforts in public service delivery and the establishment of doctrines that are sometimes linked with economic rationalism (Hood, 1989).

Numerous constitutional amendments, laws and decrees have been issued in recent decades to support the implementation of the Master Plan for the Reform of the State, under Fernando Henrique Cardoso’s mandate (Pereira, 1998). The established objectives included the reduction of the state administrative machine and the decentralization of government actions, supplying the State with effective control and decision making tools, applied to the budget, accounting, finance, equity and internal control sectors. These innovations contributed to the need for managers to get to know the costs of public entities, with a view to deciding among production, purchase, outsourcing or privatization alternatives.

As a result of the legal obligation to adopt cost systems and their role as an important tool for control and decision making, this study is guided by the following research question: to what extent to cities in the State of Paraná understanding and adopt cost systems in terms of relevance, feasibility and usefulness? Other perceptions derive from the answers obtained from public officials, as indicated in the study results.

In that sense, the aims in this research are to: get to know the level of understanding and adopting of cost systems in cities in the State of Paraná, specifically considering the answers to the survey applied, analyze the level of implementation difficulties perceived, the degree of knowledge about cost systems among these professionals and notions of structural and financial conditions.

The study is justified by the fact that it identifies the level of understanding and adoption of cost systems among municipal professionals, as these instruments can turn into an important control tool in government activities, can guarantee the achievement of budgetary objectives and, consequently, compliance with the institutional mission. Another relevant factor is the public officials’ assessment of the notion about the availability of financial and structural resources to fund the implementation of new systems, which can be a guiding element in the search for internal and/or external resources to comply with the demand. On the other hand, it is verified that research to assess the adoption of public cost systems in Brazil is still incipient and that no scientific signs of this kind exist for the State of Paraná.

Paraná is located in the South of Brazil and occupies a geographically strategic position, bordering on important economic centers like the State of São Paulo and the countries Paraguay and Argentina. The State also characterizes a corridor that links the rest of the country with the other Southern states Santa Catarina and Rio Grande do Sul. Paraná occupies an area of 199,880 km² and the state’s economy is the fifth largest in the country. The State is currently responsible for 6% of the Brazilian gross domestic product (GDP) and registered a per capita income of R\$ 21.1 thousand in 2010, higher than the R\$ 19.3 thousand for Brazil (Instituto Paranaense de Desenvolvimento Econômico e Social, *Iparades*, 2010).

This paper is structured in five sections besides this introduction: (i) theoretical framework, including citations from the literature about the modernization of Brazilian public accounting, compulsory implementation of public cost systems and accounting systems for Paraná public sector, (ii) method, including the research design, population and samples, data collection and statistical procedures applied, (iv) study results, (iv) final considerations and, to finish, the (v) References.

2. Theoretical framework

The theoretical framework, literature review, theoretical framework, theoretical arguments or theoretical background, according to Boaventura (2004), is aimed at reviewing or “demonstrating what has been written about the theme. It consists in the analysis and synthesis of information with a view to defining the action lines to address the problem and generate new and useful ideas”.

2.1 Modernization of Brazilian public administration

Following the example of what has been happening in different countries since the 1980's, like Australia, England, United States, New Zealand, Japan, Italy, Canada, Spain, Sweden, Switzerland, Argentina, Turkey, Austria, Mexico, Ireland, Portugal, South Korea and Finland, Brazil has gone through different economic reforms (Di Giacomo, 2005), aimed at promoting the “overcoming of past bureaucratic models, with a view to incorporating management techniques that introduce fundamental notions of quality, productivity, results and employee accountability into the culture of public activities” (Pereira, 1998, p. 28).

This new public management concept was based on academic studies called “The New Public Management (NPM)”, a concept that, since its preliminary mentions in the studies by Hood (1995), is aimed at combining management experiences and techniques between the public and private sectors. In summary, that authors presents the following main characteristics of NPM: the disaggregation of organizations into entities for separate management, the search for greater competition among organizations from the public and private sectors, the use of management practices that are common in companies; greater discipline in the use of resources and search for alternatives to relieve service delivery and the adoption of performance and control measures (Hood, 1995, p. 95).

Thus, the new version of public management starts to conceive administration in accordance with a professional and technical model that aims to respond to the society's demands by means of an effective public service, in accordance with the taxpayers' rights and expectations. In that sense, professionalization is expected to intensity economic development and, at the same time, maintain the political capacity to govern on behalf of the people, guaranteeing the administrative and financial commitment to put in practice public policies, without room for “bureaucratic and prebendary nobility” (Di Giacomo, 2005).

In Brazil, the 1990's were marked by different reform, as a result of Constitutional Amendments 01 to 24, related to public sector aspects. The experience started in 1995 when the Master Plan for the Reform of the State Apparatus was put in practice. Its management objectives were to reduce the state's administrative machine and decentralized government actions, however, without losing the focus on the eminently public function, on behalf of the citizens-taxpayers (Dias *et al.*, 2009). A series of measures were implemented in all Brazilian States and cities, with a view to professionalizing public management, supplying the State with effective management tools for control and decision making, applied to the budget, accounting, finance, equity and internal control sectors.

The characteristics of public administration clearly differ from the management of private institutions and, in this context, the restrictive apparatus the principle of legality imposes on managers should be highlighted, that is, in public administration, one can only do what the law permits. In private administration, on the other hand, it is legal to do anything the law does not prohibit (Meirelles, 2009). Thus, the implementation of accounting and cost systems stops being a faculty for managers and becomes compulsory. In case of non-compliance, the manager and/or public entity can be held accountable.

2.2 Legal and regulatory compulsoriness of implementing public cost systems

In the year 2000, the Federal Complementary Law 101/2000, also known as Fiscal Responsibility Law (FRL) was issued, which was revolutionary in its establishment of limits on public indebtedness and on the control of spending on human resources, besides the determination of accountability criteria to guarantee the planned balance of public accounts. The text of the Law incorporates the concept of costs, which has been firmly valued in public accounting since 1964, through article 85 of Federal Law 4.320/64:

Accounting services will be organized to permit monitoring the budgetary execution, knowing the equity composition, determining the costs of industrial services, surveying general balance sheets, analyzing and interpreting economic and financial results (LF 4320/64) [authors' italics]

Sendo assim, a LRF traz nova conotação ao antigo preceito de gestão pública: a necessidade da implantação de sistemas de custos por parte de todas as entidades governamentais brasileiras. O artigo 4º, da LRF, ainda, impõe à Lei de Diretrizes Orçamentárias (LDO) a devida instrumentalização de termos normadores à efetiva implantação dos sistemas de custos públicos, em atendimento às normas constitucionais:

Art. 4 The law of budgetary guidelines will comply with determinations in § 2o of art. 165 in the Federal Constitution and:

I – will also determine one:

(...)

e) regulations to control the costs and assess the results of programs funded with budgetary resources; (LC 101/2000 - FRL) [author's italics]

Moreover, article 50 of the FRL establishes that the bookkeeping of public accounts should heed, among other aspects, the need for permanent maintenance of cost systems that permit assessing and monitoring budgetary, financial and equity management by public managers, like health system costs, educational costs, administrative costs, program costs, charge costs and debt execution for example. Other determinations, like article 14 in the FRL, regulate cost control as a fundamental additional measure to comply with legal determinations, like the control of foregone revenues and the concession of tax benefits.

Art. 50. Besides complying with the other public accounting standards, the bookkeeping of public accounts has to comply with the following: (...)

§ 3º Public Management is to maintain a **cost system** that permits the assessment and monitoring of budgetary, financial and equity management. (LC 101/2000 - FRL) [authors' italics]

Art. 14. The concession or expansion of tax incentives or benefits that give rise to foregone revenues should be accompanied by the estimated budgetary-financial impact during the year it is to gain force and the two subsequent years, comply with the legal determinations of the law of budgetary guidelines and with at least one of the following conditions:

(...)

§ 3º The determinations in this article do not apply:

(...)

II – to the cancelation of debts whose amount remains below that of the respective charge **costs**. (LC 101/2000 – FRL) [authors' italics]

Another landmark took place in 2008, when the Secretary of the Treasury (MF) issued Decree 184/08 and determined that the Secretary of the National Secretary (STN) should promote convergence between the International Accounting Standards published by the International Federation of Accountants

(IFAC) and the Brazilian Standards applied to the Public Sector, issued by the Federal Accounting Council (CFC), considering the adoption of good accounting routines as a credibility factor and an instrument for economic-financial and performance monitoring and comparison in public entities, besides granting economical and efficient resource allocation (Decree 184/2008).

In Brazil, through joint efforts that involved professional and governmental entities and accountancy researchers, this convergence has been taking place since 2010. The ministerial authorization provoked a range of studies all over the countries and culminated in the Federal Accounting Council's (CFC) publication of ten Brazilian Accounting Standards Applied to the Public Sector (NBCASP), numbered from 16.1 to 16.10. Among these regulations, NBCASP 16.2 is cited, attested in Resolution 1.129/2008-CFC, called Equity and Accounting Systems, whose contents describe, among other aspects, the implementation of cost systems as a modality of the accounting subsystem.

12. The accounting system is structured into the following information subsystems:

- (a) Budgetary - registers, processes and discloses the acts and facts related to budgetary planning and execution;
- (b) Financial - registers, processes and evidences the facts related to financial inflows and outflows, as well as capital available at the start and end of the period;
- (c) Equity - registers, processes and discloses non-financial facts related to qualitative and quantitative variations in public equity;
- (d) **Costs** - registers, processes and discloses the costs of goods and services the public entity produces and offers to society;
- (e) Compensation - registers, processes and discloses the management acts whose effects can produce modifications in the public sector entity's equity, as well as acts with specific control functions. (CFC, NBCASP 16.2) [authors' marks]

NBCASP 16.2 also establishes that the respective accounting subsystems need to be integrated mutually and with other operational electronic and information systems, so as to help public administration to comply with its institutional mission, related to the assessment of the results obtained through the execution of its programs, focusing on the preservation of principles like economy, efficiency, effectiveness and efficacy, also permitting the assessment of planned and budgetary targets, as well as the analysis of the risks and contingencies public entities are subject to.

2.3 The State of Paraná and its cities

This study is focused on the cities in the State of Paraná, which is one of the most important units of the federation in economic terms, with 399 cities and the state capital Curitiba. The State holds the fifth highest number of cities, preceded by Minas Gerais with 853 cities, São Paulo with 645, Rio Grande do Sul with 496 and Bahia with 417 cities. Paraná figures among the eight Brazilian states that concentrate 80% of the national GDP, together with São Paulo, Rio de Janeiro, Minas Gerais, Rio Grande do Sul, Bahia, Santa Catarina and the Federal District. In that sense, the industrial center in metropolitan Curitiba, the seaports of Paranaguá and Antonina and tourism in the Western region, represented by the border city of Foz do Iguaçu, are relevant. The State is divided in ten greater regions, which are: Metropolitan region of Curitiba, Central-Western Paraná, Central-Eastern Paraná, Central-Southern Paraná, North-Western Paraná, Central-Northern Paraná, Pioneering Northern Paraná, Western Paraná, South-Eastern Paraná and South-Western Paraná (Ipardes, 2010).

As a result of these signs, the group of cities in Paraná attracts researchers' attention, given its economic importance, as evidenced in the public balance sheets and social and economic indicators, whether because of their physical and geographic wealth or the degree of expansion of their business. On the other hand, at the same time, their income concentration entails the need for skillful control in order to allow administrative managers to guarantee the performance society expects in terms of services and public works.

2.4 Accounting Systems for the municipal public sector in Paraná

Since the financial year 2001, when the Fiscal Responsibility Law was enacted, the State of Paraná has implemented electronic procedures to supervise municipal public accounts. These measures ended up imposing modernization on the accounting sectors in all cities in the state, as accountability, compulsory by law, was done only electronically from that moment onwards, through systems created and supplied directly by the supervisory entity, the Paraná State Court of Auditors. The main system, in the municipal sphere, was called the Municipal Information System (MIS).

The MIS was officially established in the Paraná State Court of Auditors (TCE-PR) Provision 46/2001, with a view to the rationalization of information for the sake of external control, to receive the data needed for accountability purposes. Its main goal is to speed up the verification of accounts, help to monitor the cities' budgetary, accounting, financial, equity and operational management, with compulsory use by the Legislative and Executive Powers, including authorities, foundations, inter-municipal consortia and Municipal Public Power corporations. MIS data should be properly based on accounting recorded, in compliance with the CFC's Brazilian Accounting Standards, making agents responsible for their trustworthiness and exactness (TCE-PR, 2001).

Therefore, the electronic systems created in Paraná represent a fundamental element for the convergence between public accounting and international standards, considering that computerization lies at the heart of accounting modernization, without which it becomes impossible to implement the cost systems established by law and in NBCASP 16.2. In line with that standard, provided that cities in the state of Paraná have already implemented a modern electronic accounting system, the road remains open for future adaptations, in the cultural or structural sense, or for the implementation of public cost systems.

2.5 Functions of Cost Accounting in the public sector

The modernization of the public sector entailed innovations that contributed to the need for public managers to know the partial and total costs of their entities, with a view to making the best decisions among production, purchase, outsourcing or privatization alternatives. Therefore, cost is conceptualized as any sacrifice (consumption) of assets to achieve products or services (Slomski, 2006). The same author considers that public entities can successfully use the main costing methods, that is, the Absorption Costing; Variable or Direct Costing; Activity-Based Costing as well as the Standard Costing Methods can be used to measure their costs.

In public management, a costing system represents a fundamental instrument to verify results and assess resource management, considering the effectiveness and efficiency of the services produced, the works accomplished and the government programs (Dias *et al*, 2009).

Martins (2003, p. 21) indicates two relevant functions for cost accounting: support control and support decision making. According to that author, regarding control, its "most important mission is to provide data to set standards, budgets and other forms of forecasting" and, in a subsequent stage, to support the monitoring of actions. As regards decisions, "cost accounting consists in the input of information on relevant values" to be managed.

In line with Silva (2007), the cost system has to provide information for certain objectives, including the planning and control of operations and activity costs, through the creation of reports on costs and assets per management unit, per cost center, for the managers. According to (IFAC, 2000) *apud* Dias *et al* (2009), cost information can attend to different management needs in public management, highlighting the six social functions of cost accounting, as displayed in Figure 1.

Social Function	Management Needs
Budget	Cost information can help to decide on the allocation of resources among different activities. The costs of past activities can be used as budgetary estimates of future costs.
Cost Reduction and Control	Cost behavior analysis can help to take appropriate actions in order to eliminate inefficiencies.
Adjustment of Prices and Tariffs	Help to establish price and tariff scenarios for goods and services supplied by the government, especially when these are provided at a price below the cost, as a result of governmental policies.
Performance Assessment	Can help to measure financial and non-financial performance. The efforts and results of an entity's services can be assessed based on the following measures: cost of resources and inputs used to provide the services and the result achieved.
Program Assessment	Cost information can support political decisions related to their authorization, modification and discontinuity.
Other Economic Decisions	The choice among alternative actions requires cost comparisons or increased revenues, like decisions to privatize for example, to accept or reject a proposal for a governmental project, to continue or discontinue a product or service.

Figure 1. Management needs of public administration.

Source: Dias *et al.* (2009).

Wiemer and Ribeiro (2004) defend the relevance of cost determination in view of the need for social control, as the determination and publication of costs grants users and auditors information about the quality of service delivery. The authors add that, due to the inexistence of a cost system, this control is only centered on the formal and legal aspects of management acts.

According to Rezende, Cunha and Cardoso (2010), the importance of information about the government's costs is not limited to their possible contribution to public spending efficiency and effectiveness, but also in view of what it represents in the light of the need for an in-depth reform of public management in Brazil, fundamental to allow the public power to appropriately respond to the contemporary challenges the Brazilian society is confronted with.

It should be mentioned that cost information can permit a range of improvement for public management as well as for the citizens who use public services and works, in Brazil and around the world, according to the research by Costa, Santos, Rodrigues, Barreto and Roberts (2005), who estimated the costs of tuberculosis for the health system in Salvador; by Turner, Woolley and Kingsley (2007), who estimated the costs of building popular houses in the United States; and by Sonfield, Host, Gold and Finer (2011), who identified the costs of unwanted pregnancies for public health insurance programs in New York.

Therefore, the cost systems, which have always represented a fundamental instrument for decision-making in private initiative, now turn into a compulsory element for the responsible management of public resources.

3. Method

This study uses descriptive methods to achieve the proposed objective, which is to get to know the level of understanding and adoption of cost system in cities in Paraná. The research is characterized as descriptive because it attempts to describe the behavior of phenomena or characteristics of the target population, measure and/or quantify the events (Cooper and Schindler, 2003).

The data collection method is based on the interrogation/communication procedure, through an *ex post facto* research, in which the set of data obtained from the respondents is neither altered nor manipulated. The study is also cross-sectional, as it represents a momentary picture. The approach is qualitative, also dealing with the bias of subjectivity in the survey answers (Cooper and Schindler, 2003).

In terms of range and depth, the data are submitted to statistical treatment, initially to descriptive analysis, followed by Spearman's correlation coefficient technique, whose model permits assessing the data to provide whether one proposal explains another (Cooper and Schindler, 2003). To accept or reject the

research proposals, significance is set at 0.05 and 0.01. Spearman's correlation coefficient is a non-parametric statistical technique, which first ranks the data and then applies Pearson's equation (Field, 2009). For statistical treatment, SPSS – Statistical Package for the Social Sciences software, version 17 was applied.

The elaboration of this study departs from a literature review and the consultation of documents and cost control and cost system standards in force. A form was developed with direct proposals, about which the public officials' perceptions were requested, using a five-point Likert scale with the following options: (1) I completely disagree, (2) I disagree, (3) indecisive (4) I agree and (5) I fully agree.

The population includes all cities in the State of Paraná, totaling 399. Data were collected from controllers, accountants or public servants working in municipal accounting sectors. Each city received a survey for completion. The sample was defined by the number of complete forms that were returned, that is, 67 cities, related to the financial year 2010.

4. Study results

The research theme is subdivided in topics. This facilitates the understanding of the proposals the public officials were asked to opine on. The same subdivision also permits a detailed analysis of the collected data, considering: 1- relevance of cost information; 2 – budgetary and financial feasibility of adopting cost systems; 3 – accrual base of cost information; 4 – environment for the cost system; 5 – cost systems implemented; and 6 – operating systems.

4.1 Descriptive analysis of the data

The research results are submitted to descriptive analysis of the data, which express the public officials' position towards each proposal, whose results are presented as percentages. In topic 1, aspects related to the relevance of cost information are investigated. In this context, internal disclosure, cost control and the adoption of a cost system are addressed. In Table 1, the consulted public officials' perception is presented.

Table 1
Conceptions about the importance of cost information

Proposals related to topic 1	I completely disagree (%)	I disagree (%)	Indecisive (%)	I agree (%)	I completely agree (%)
1.1 Internal information is disclosed about the need for cost controls.	40.3	13.4	10.4	34.4	1.5
1.2 Discussions about the cost of services or cost systems are common at the institution.	46.2	23.9	7.5	13.4	9
1.3 The institution adopts some kind of cost control for the administrative sector.	4.5	25.4	10.4	55.2	4.5
1.4 The institution adopts some kind of cost control for the education sector.	11.9	13.4	3	65.7	6
1.5 The institution adopts some kind of cost control for the health sector.	4.5	19.4	1.5	58.2	16.4
1.6 The institution adopts some kind of cost control for the public works sector.	10.4	26.9	17.9	34.4	10.4
1.7 The institution adopts some kind of cost control for other sectors not identified in phrases 1.3; 1.4; 1.5; 1.6 listed above.	35.8	49.2	7.5	1.5	6
1.8 I find the administration's efforts to adopt cost systems important.	1.5	0	3	19.4	76.1

Source: Empirical research data.

According to data displayed in Table 1, 53.7% of the public officials consulted about the importance of cost information disagree about the existence of internal information disclosure with a cost control focus. And 70.1% reveal disagreement about discussions on the costs of services or cost systems. Therefore, in proposals 1.1 and 1.2, limited internal disclosure is verified about cost control and cost system, according to the interviewees.

The interviewees' responses to proposals 1.3; 1.4; 1.5 and 1.6 indicate a favorable position to the adoption of some form of cost control in the administrative, education, health and public works sectors. According to 95.5% of the interviewees, the administration's efforts to adopt cost systems is important, in line with the intent to support the importance of cost information in public management.

Topic 2 refers to aspects related to the budgetary and financial feasibility of adopting cost systems, focusing on the year the system was implemented. In Table 2, the public officials' opinions are classified.

Table 2

Conception about the budgetary and financial feasibility of adopting cost systems

Proposals related to topic 2	I completely disagree (%)	I disagree (%)	Indecisive (%)	I agree (%)	I completely agree (%)
2.1 The implementation of cost systems in the next year is considered feasible in budgetary and financial terms.	1.5	4.5	14.9	53.7	25.4
2.2 The implementation of cost systems in 2012 is considered feasible in budgetary and financial terms.	1.5	1.5	10.5	49.2	37.3
2.3 The implementation of cost systems after 2012 is considered feasible in budgetary and financial terms.	6	1.5	44.7	7.5	40.3

Source: Empirical research data.

The results identified in Table 2 permits inferences about the lack of budgetary and financial feasibility to adopt cost systems in the year the research applied to, that is, 2010. Although a significant part of the public officials find it possible to implement the cost system in 2011 or 2012, 44.7% are indecisive towards the implementation after 2012. Hence, one tends to accept the fact that the public officials are unaware of the city's actual conditions regarding the budgetary and financial feasibility of adopting cost systems.

Topic 3 relates to the officials' conception about the accrual basis of cost information. In this context, aspects about project and activity costs were investigated, as well as knowledge about cost standards for the public sector, training for public servants and operating systems, as presented in Table 3.

Table 3

Conceptions about the accrual base of cost information

Proposals related to topic 3	I completely disagree (%)	I disagree (%)	Indecisive (%)	I agree (%)	I completely agree (%)
3.1 The institution knows the factors that influence the cost of its projects and activities.	19.4	13.4	61.2	3	3
3.2 Some professionals know the cost standards for the public sector.	35.8	7.5	3	49.2	4.5
3.3 Public servants receive training about cost systems.	40.3	28.4	1.5	16.4	13.4
3.4 Established operating systems have been prepared to adopt cost subsystems.	9	0	26.9	59.6	4.5
3.5 Some professionals are specialized in costs.	17.9	16.4	37.3	20.9	7.5
3.6 Technical staff members exist who possess specialized knowledge in costs.	35.8	22.4	28.4	13.4	0

Source: Empirical research data.

Based on the data in Table 3, proposal 3.1 stands out, in which 61.2% of the officials declare their indecision as to whether the institution knows the factors that influence the costs of projects and activities. It is verified that 53.7% agree with the existence of professionals who know the cost standards for the public sector, and that 64.1% agree with the existence of established operating systems prepared for the adoption of cost subsystems. Nevertheless, the data indicate disagreement about training for public agents and only 7.5% of the respondents agree that there are professionals with specialized knowledge about costs.

In topic 4, the public officials' conception about the environment for the cost system is investigated. The aim is to identify the intention of managers, public servants and legislators about the adoption perspective of the cost system, also considering the municipal government and the implementation timetable. In Table 4, the classification of the public officials' conceptions is displayed.

Table 4

Conceptions about the environment for the cost system

Proposals related to topic 4	I completely disagree (%)	I disagree (%)	Indecisive (%)	I agree (%)	I completely agree (%)
4.1 The public managers intend to adopt a cost system.	50.7	38.9	1.5	7.4	1.5
4.2 Managers and public servants interact with a view to the adoption of cost systems.	55.2	6	28.3	3	7.5
4.3 The public servants intend to adopt cost systems.	32.8	31.3	21	10.4	4.5
4.4 Municipal legislators intend to adopt cost systems.	43.3	35.8	14.9	6	0
4.5 The institution intends to implement costing techniques over the next years.	3	19.4	4.5	55.2	17.9
4.6 The municipal government has a timetable for the implementation of a cost system.	56.6	23.9	9	7.5	3
4.7 A cost control system can be implemented in the municipal government today.	31.3	13.4	43.3	9	3
4.8 The implementation of a cost system would respond to the institution's operational needs.	0	7.5	13.4	76.1	3

Source: Empirical research data.

According to Table 4, considerable disagreement exists about the managers' intent to adopt a cost system in 89.6%; servants in 64.1%; and legislators in 79.1%, according to the public officials. Proposal 4.7 stands out, with 43.3% of indecision towards the possibility of implementing a cost system in the municipal government. According to 79.1% of the opinions, on the other hand, this implementation would respond to the operational needs.

Topic 5 relates to the conception about cost systems put in practice. In that sense, the intent is to verify aspects like: cost information control; direct, indirect costs and activity-based costing method (ABC) and its relation with projects and activities, feedback, decision making and the elaboration of financial reports. Table 5 displays the public officials' perception.

Table 5

Conceptions about cost systems put in practice

Proposals related to topic 5	I completely disagree (%)	I disagree (%)	Indecisive (%)	I agree (%)	I completely agree (%)
5.1 Cost information control exists in the form of worksheets and/or independent, non-integrated systems.	1.5	14.9	23.9	46.3	13.4
5.2 Cost information is controlled through an integrated system.	38.8	22.4	28.3	4.5	6
5.3 Direct costs are related to projects and/or activities.	1.5	22.4	32.8	28.4	14.9
5.4 Indirect costs are related to projects and/or activities on some cost-sharing base.	10.4	41.9	31.3	11.9	4.5
5.5 Costs are related to projects and activities through Absorption costing.	29.9	9	43.2	11.9	6
5.6 Costs are related to projects and activities through Activity-Based Costing (ABC).	34.3	6	55.2	4.5	0
5.7 The managers receive feedback on cost controls.	9	43.2	22.4	20.9	4.5
5.8 Cost system information has been useful for managers and sector heads' decision making.	23.9	13.4	19.4	37.3	6
5.9 The cost systems put in practice produce financial reports.	10.4	19.4	26.9	40.3	3

Source: Empirical research data.

Table 5 reveals that 59.7% agree with the existence of cost information in non-integrated worksheets and/or independent systems in the municipal governments. While 43.3% agree with direct costs linked with projects and activities, 52.3% disagree with indirect costs linked with projects and activities based on cost sharing. Indecision towards the use of absorption costing and ABC was identified in 43.2% and 55.2%, respectively. Disagreement as to feedback on cost controls was found in 52.2%; 43.3% agreed with the usefulness of information for decision-making purposes, and also with the fact that the cost systems put in practice generate financial reports.

To get to know the public officials' opinions about operating systems, in topic 6, a set of proposals is presented to verify: the integration among operating systems; origin, production and reliability of the data; and availability of databases. These aspects are displayed in Table 6.

Table 6

Conceptions about operating systems

Proposals related to topic 6	I completely disagree (%)	I disagree (%)	Indecisive (%)	I agree (%)	I completely agree (%)
6.1 The operating systems are mutually integrated, so as to use the same databases.	3	34.3	29.9	22.4	10.4
6.2 The data from the operating systems originate in different databases.	1.5	13.4	19.4	62.7	3
6.3 The data available in the databases are compatible and shared among the areas.	6	46.3	16.4	17.9	13.4
6.4 The data available in the operating systems contain many errors.	9	20.9	34.3	22.4	13.4
6.5 The data available in the operating systems are stable, do not vary frequently and can therefore be considered reliable.	19.4	7.5	49.2	16.4	7.5

Source: Empirical research data.

According to Table 6, the public officials' opinions towards the use of the same databases based on integrated operating systems are balanced. Also, in proposal 6.4, a balanced opinion is verified about the presence of errors in the data available in the operating systems. On the opposite, in proposal 6.5, 49.2% were indecisive as to the stability and reliability of the data available in the operating systems. In addition, 65.7% agree about the different origins of the data, and 52.3% disagree about the availability and sharing of data among the areas.

This finishes the descriptive data analysis section. Next, inferences are presented about the correlation analysis applied to the proposals the public officials were asked to opine on.

4.2 Correlation analysis of the proposals

To relate the public officials' understanding about the research proposals on the relevance of cost information and the feasibility of usefulness of cost systems, Spearman's correlation coefficient was applied. Thus, the intent is to filter the correlation among proposals with regard to the responses obtained about the perception levels: I completely disagree; I disagree; indecisive; I agree; I completely agree. Correlations are established between proposals that address the same topic, so as to test the public officials' understanding about those proposals, as presented in Table 7.

Table 7

Spearman's Correlation and significance level

	N	Spearman Coefficient	Significance (1-tailed)
Correlation between proposals 1.3 and 1.6	5	1.000 **	0.000
Correlation between proposals 1.4 and 1.5	5	0.900 *	0.019
Correlation between proposals 1.7 and 1.8	5	-0.900 *	0.019
Correlation between proposals 2.1 and 2.2	5	0.975 **	0.002
Correlation between proposals 3.1 and 3.6	5	0.872 *	0.027
Correlation between proposals 4.1 and 4.3	5	0.821 *	0.044
Correlation between proposals 4.1 and 4.4	5	0.821 *	0.044
Correlation between proposals 4.1 and 4.6	5	0.821 *	0.044
Correlation between proposals 4.4 and 4.6	5	1.000 **	0.000
Correlation between proposals 5.1 and 5.9	5	0.900 *	0.019
Correlation between proposals 6.2 and 6.4	5	0.900 *	0.019

N: sample size.

* Correlation significant at 0.05%.

** Correlation significant at 0.01%.

Source: Empirical research data.

The results identified through the application of Spearman's coefficient vary between -1 (perfect negative correlation) and +1 (perfect positive correlation), including 0 (absence of correlation). After the application of the coefficient, whose results are displayed in Table 7, the following considerations are presented about the correlations found, as follows:

Correlation between proposals 1.3 and 1.6	Based on the correlation test applied to proposals 1.3 and 1.6, showing a Spearman coefficient of 1.000 at a significance level of 0.01%, the correlation, that is, the agreement about the adoption of some cost control for the administrative and public works sector can be considered as perfectly positive.
Correlation between proposals 1.4 and 1.5	The Spearman coefficient of 0.900 at a significance level of 0.019, makes the correlation between proposals 1.4 and 1.5 valid, regarding the adoption of cost control measures for education and health in the city.
Correlation between proposals 1.7 and 1.8	The correlation between proposals 1.7 and 1.8, with a Spearman coefficient of 0.900 for a significance level of 0.019, reveals agreement on the adoption of cost controls in different sectors, combined with the importance of the administration's efforts in the adoption of a cost system.
Correlation between proposals 2.1 and 2.2	The correlation coefficient between proposals 2.1 and 2.2, corresponding to 0.975, with a significance level of 0.002, indicates strong affinity in the conceptions about the budgetary and financial feasibility of implementing cost systems.
Correlation between proposals 3.1 and 3.6	Proposals 3.1 and 3.6 are strongly correlated, according to the Spearman coefficient of 0.875 at a significance level of 0.027, relating the indecision towards knowing the factors that influence costs with the non-agreement about the existence of technical staff specialized in the cost area.
Correlation between proposals 4.1 and 4.3	The correlation between proposal 4.1 and 4.3; 4.4; and 4.6 show a Spearman coefficient of 0.821 with a significance level of 0.044, which characterizes a positive correlation between disagreement about the managers, officials and legislators' intent to adopt a cost system and the presence of a timetable for the implementation of the cost system.
Correlation between proposals 4.1 and 4.4	
Correlation between proposals 4.1 and 4.6	
Correlation between proposals 4.4 and 4.6	The Spearman coefficient of 1.000 and the significance level of 0.01% reveal a strong positive correlation between proposals 4.4 and 4.6, showing disagreement on municipal legislators' intent to adopt cost systems combined with disagreement on the existence of a timetable for the implementation of the cost system.
Correlation between proposals 5.1 and 5.9	The correlation coefficient of 0.900 and the significance level of 0.019 between proposals 5.1 and 5.9 reveal affinity in the public officials' agreement on the control of cost information in non-integrated worksheets and/or independent systems and the respective production of financial reports.
Correlation between proposals 6.2 and 6.4	Proposals 6.2 and 6.4 show a Spearman coefficient of 0.900 at a significance level of 0.019, that is, a positive correlation between the origins of the operating system data in different databases and the presence of many errors in the data available in the operating systems.

Figure 2. Results regarding the correlation between the proposals.

Source: Empirical research data.

In view of the above, based on descriptive analysis and Spearman's correlation coefficient, the incipient nature of the public officials' conception about the relevance, feasibility and usefulness of a cost system is demonstrated. Nevertheless, in this study, a significant part of the public official reveal a coherent position when they agree with or disagree from proposals about cost information and control. It is definitely positive for the city to have public officials with that perception at their disposal when the implementation of a cost system is made compulsory.

5. Final considerations

The activities of public entities, in this case cities, encourage the search for information about public resource management practices. In this respect, the goals of the present study were achieved, which was to discover the level of understanding and adoption of cost systems in cities in the state of Paraná, through the application of a survey. Hence, the identified results cannot be generalized, as they exclusively relate to the study sample, whose data were submitted to descriptive analysis and the statistical correlation test using Spearman's coefficient.

In addition, the degree of professionals' implementation difficulties was analyzed, as well as their knowledge levels about cost systems and notions about structural and financial conditions. The results reveal the public officials' limited knowledge, mainly on topics about the budgetary and financial feasibility of adopting cost systems; the environment for the cost system, implemented cost systems and operating systems.

A bias of indecision is highlighted for the following proposals: 44.7% are indecisive about the budgetary and financial feasibility of implementing cost systems after 2012; 61.2% about whether the institution knows the factors that influence the cost of its projects and activities; 43.3% about the possibility of implementing a cost control system in the municipal government today; 43.2% about project and activity costs using Absorption costing; 55.2% about project and activity costs using ABC; 49.2% about the proposal that the data available in the operating systems are stable, do not vary frequently and can therefore be considered reliable.

According to Table 5, however, the respondents' conception about cost systems in cities in the state of Paraná should be highlighted. The low effective implementation levels of these systems are noteworthy, in view of the complete agreement on the existence of cost control through worksheets and/or systems, corresponding to 13.4% (topic 5.1), about the control of cost information through an integrated system, corresponding to 6% (topic 5.2) and about the fact that cost systems produce useful information for decision making, corresponding to 6% (topic 5.8).

Finally, the relevance of this descriptive study is highlighted, as it investigates aspects inherent in cost systems and their implementation in the cities. As the study is based on the public officials' conception about the topics related to cost systems, the incipient nature of knowledge about the relevance, feasibility and usefulness of a cost system is verified, although significant coherence was also revealed among the answers obtained on the proposals about cost information and control.

6. References

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