

# Purchasing function in the public sector: challenges to promote agility in electronic reverse auctions

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This paper analyses the issue of delivery time in the procurement process within the Brazilian federal public administration. Based on the principle of celerity, the main goal is to analyze the factors that have influenced the implementation of the sub-phases of electronic auctions held at the Base Aérea de Natal (Bant). Based on the theoretical framework of the procurement function, four dimensions were established: Legislation and procurement processes, Structure and organization of the purchasing sector, Purchasing systems and Human resources of the purchasing sector. The methodology consisted of semi-structured interviews carried out with the public agents of Bant. The analysis by sub-phases, an unprecedented strategy, identified new factors: lack of integration between the requesting and purchasing sectors, lack of integration between the requesting sector and the auctioneer and failures in the data base Comprasnet.

**Keywords:** public procurement; electronic auction; agility.

## Função compras no setor público: desafios para o alcance da celeridade dos pregões eletrônicos

Este artigo aborda a questão dos prazos nos processos de compras no âmbito da administração pública federal. Seu principal objetivo é analisar os fatores que influenciaram na execução das subfases do pregão eletrônico na Base Aérea de Natal (Bant) tendo como parâmetro o princípio da celeridade. Baseado na teoria sobre a função compras, quatro dimensões foram estabelecidas: “Legislação e processos de compras”, “Estrutura e organização do setor de compras”, “Sistemas de compras” e “Recursos humanos do setor de compras”. No campo metodológico, foram realizadas entrevistas semiestruturadas com os agentes públicos da Bant. A análise por subfases, procedimento inédito na literatura, identificou novos fatores que afetam a celeridade: falta de integração entre o setor requisitante e o de compras, falta de integração entre o setor requisitante e o pregoeiro e falhas no banco de dados do Comprasnet.

**Palavras-chave:** compras públicas; pregão eletrônico; celeridade.

## La función de compras en el sector público: desafíos para lograr la celeridad en las licitaciones electrónicas

Este artículo aborda el tema de los plazos en los procesos de compras en la administración pública federal brasileña. El principal objetivo es analizar los factores que influyeron en el logro de las sub-fases de la licitación electrónica en la Base Aérea de Natal (Bant) teniendo como base el principio de la celeridad. Basado en la teoría de la función de compras, cuatro dimensiones fueran establecidas: “Legislación y procesos de compras”, “Estructura y organización del sector de compras”, “Sistemas de compras” y “Recursos humanos del sector compras”. En el ámbito metodológico se realizaron entrevistas semiestructuradas con los agentes públicos de Bant. El análisis por sub-fases, procedimiento sin precedentes en la literatura, identificó nuevos factores: falta de integración entre el sector solicitante y el de compras, falta de integración entre el sector solicitante y el pregonero, y fallas en la base de datos Comprasnet.

**Palabras clave:** compras públicas; licitación electrónica; celeridad.

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## 1. INTRODUCTION

The bidding modalities provided for in Law No. 8,666/1993, which regulates government purchases, are recognized by excessive rigidity and high bureaucratic control, which end up harming the purchasing efficiency (Carvalho, 2005). According to Rosilho (2011), the General Law on Bids and Contracts followed the path of “superlegalization”, since it has created strict and meticulous procedures by reducing the discretion of the purchasing operator in attempt to better contract the acquisition of goods and services.

In the search for greater efficiency in the purchasing process, the federal government, influenced by the ideas of the new public management (Motta, 2010), instituted through Law no. 10,520/2002 a new bidding modality known as the reverse auction. It is a bidding modality in which suppliers bid successively, winning the one that offers the lowest price for the goods or service that the State needs to acquire (Carvalho, 2005). The electronic form of the trading floor was regulated by Decree No. 5,450/2005 and, subsequently, Decree No. 5,504/2005 made it compulsory to use them, except in cases of proven non-viability (Brazil, 2005). One of the causes that would lead the trading to be a more agile procedure than the other modalities is the fact that there is a reversal of the phases of qualification and acceptance of the proposal (Faria et al., 2008; Motta, 2010). While in the other modalities, the purchasing operator, in the case of the bidding committee, must first verify the documentation of all the candidate companies, only after verifying all the proposals of the companies considered qualified, in the trading session the reverse is true: only the documentation is analyzed of the supplier that offered the lowest price after a decreasing price dispute. To achieve this, the electronic trading floor is developed with support in the Integrated System of General Services Administration (Siasg)<sup>1</sup> and comprises two distinct steps: the internal phase, which is performed within the organization, and the external phase, which occurs through the Government Procurement System (SCG), in particular on the Government Procurement website. In each of these phases, a sequence of specific procedures, defined in general terms by the current legislation, directly influences the completion of the procurement process. These procedures were called, for the purposes of this research, “sub phases” of the electronic purchasing process.

Among the advantages offered by the advent of electronic trading, Faria and collaborators (2010) affirmed that the significant increase in the participation of suppliers was one of the determining factors for the price variation contracted through electronic trading, so that the public agencies obtained a greater economy of resources. However, when considering the variable “process execution period”, the specialized literature points out that electronic trading is a complex and time-consuming process (Motta, 2010; Rosilho, 2011; Araújo and De Jesus, 2013). Among the criticisms that the modality has received, the question of attending to the principle of speed of the process has begun to stimulate the interest of scholars and specialists in the subject (such as Silva and Rocha, 2006; Gonçalves, 2012; Castro, 2014). According to Bonfim (2008), by this principle, management must ensure that the process seeks to build the ultimate goal in the shortest time possible.

This research was carried out in an organization of the direct administration of the federal government, the Natal Air Base (Bant), to analyze the reality that is presented in the scope of the development of the

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<sup>1</sup> Siasg is software of great scope and complexity, with several modules to support public acquisitions. Among these modules is Comprasnet or Government Procurement, in which the entire external phase of the electronic procurement process is carried out.

stages of the electronic trading session in public administration. The objective of this paper is to analyze the factors that mainly influenced the execution of the subphases of the electronic trading session in the Bant, in the year 2014, regarding compliance with the principle of celerity.

Bant is an organization of the Aeronautics Command (Comaer) whose mission is “To provide the necessary support for the Air and Aircraft Units that operate in it, permanently or temporarily, or which are based in it” (Rica 21-9).<sup>2</sup> Therefore, this military organization must ensure, as a priority, all technical and administrative resources necessary for the maintenance, operation and efficient use of the headquartered units. Through the Bidding, Contracts and Covenants Section (BLC), Bant centralizes all purchases and, therefore, must acquire several types of goods and services for the basic maintenance of its activities such as: expedient, electrical, parts for the maintenance of vehicles, and it does so, mainly, through the electronic bidding modality (Siasg, 2015). There is a perception by the military unit staff that the trading sessions are also time consuming, hampering the achievement of its mission. In addition, the lack of completion of bidding processes in time to use the available financial resources (processes initiated, but not finalized) leads to the devolution of budgetary resources to the federal government, impairing the maintenance of its activities (Siafi, 2016). Hence the importance of the study on the subject, since that improving the purchasing process can contribute to the better accomplishment of the organization mission.

To understand the reasons for procrastination, this article is organized into five sections. In addition to this introduction, section 2 addresses the theoretical framework and section 3 describes the methodological procedures. Section 4 presents the data and discusses the results of the analysis and, finally, section 5 presents the conclusion.

## 2. THEORETICAL BACKGROUND

The research had as reference the concepts that surround the purchasing function, one of the main elements of logistics and supply chain management (GCS), whose objective is: “to buy the correct material with quality, *in the right time*, in the exact quantity, from the right source at the right price” (Baily et al., 2008:31, emphasis added).

The choice of the theoretical reference coming from the private management of purchases was motivated by the understanding that the electronic trading was conceived within the scope of the ideas of the new public management (NGP) which, in turn, also had in the private management practices their inspiration (Motta, 2010). In order to better define the dimensions of analysis, the research was inspired by the four pillars under which the Framework for Assessing the Acquisition at Federal Agencies (Government Accountability Office (GAO), 2005)<sup>3</sup> document was prepared. Therefore, adapting them to the reality of the Brazilian purchasing process, the present research focused on analyzing, as in the American case, the efficiency of the acquisition processes — but limited to its temporal form — thus elaborating the following dimensions of analysis: “Structure and organization

<sup>2</sup> Internal Regulation of the Aeronautics Command approved by the Second Regional Air Command (Comar II) n. 201/A6 of May 19, 2015.

<sup>3</sup> This document was developed by the Government Accountability Office, an independent agency that works for the US Congress and is responsible for overseeing and controlling the procurement activities of the federal public service in that country, aimed at improving the efficiency of public procurement.

of the purchasing sector”, “Specialized human resources”, “Procurement processes” and “Procurement systems”. Such a strategy was used by Motta (2010). However, this author worked only with the first three dimensions when analyzing and comparing the efficiency of the Brazilian purchasing system with the practices of private management and with the North American acquisition system in the fight against waste in public spending.

### 2.1 STRUCTURE AND ORGANIZATION OF THE PURCHASING SECTOR

The profile of the purchasing department has evolved in private organizations in a way that is no longer a submissive sector and becomes part of the organization’s strategy formulation process (Ellram and Carr, 1994; Braga, 2006; Tassabehji and Moorhouse, 2008). With this profile, “the Purchasing and Supplies function now has direct access to top management, facilitating the flow of information, which implies *greater agility* and quality of its performance” (Motta, 2010:30, emphasis added). The evolution of the profile of the purchasing department went through four different stages, as summarized in chart 1.

**CHART 1** EVOLUTIONARY STAGES OF THE PURCHASING DEPARTMENT

Evolutionary stages of the purchasing department	Characteristics
1 <sup>st</sup> Stage — Operational Profile	The purchasing sector is responsible only for the operation of purchase activities. All the negotiation is in charge of the requisitioning sector. The organization does not elaborate a plan, which hinders the activities of the purchasing sector, which works to “put out fires.”
2 <sup>nd</sup> Stage — Tactical Profile	Purchases begin to be negotiated by the purchasing department, which generates the need for greater communication between the requisitioning sector and the purchasing sector. The organization starts to worry about the costs and the entire logistics flow of the purchasing process.
3 <sup>rd</sup> Stage — Transition profile from tactical to strategic	The supplier becomes involved in the process directly, including contributing to the specifications of the goods to be acquired, together with the organization’s internal customer (requisitioning sector) and purchasing staff.
4 <sup>th</sup> Stage — Strategic Profile	There is total integration of the purchasing sector with the strategic body of the organization. This sector becomes part of the strategy formulation of the company. Purchases become fully planned and the urgency of procurement is minimized or virtually nonexistent.

**Source:** Elaborated by the authors with basis on Braga (2006); Ellram and Carr (1994).

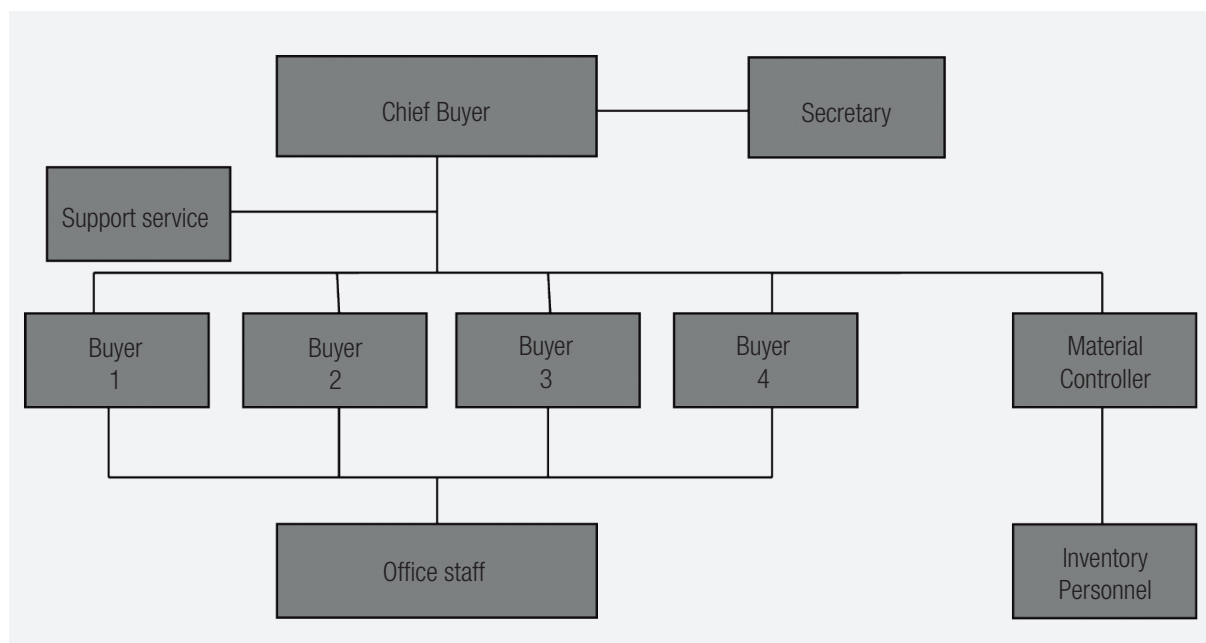
It should be noted from the information in chart 1 that there has been a continuous improvement of the communication among the direct participants of the purchasing process, aiming at the reduction of costs and time, since that the buyer not necessarily has full knowledge about the goods and services requested by the requesters, even in the face of the specifications of the item. This can lead to a

frustrated purchase, either due to quality or to incorrect descriptions, leading to loss of time for the formulation of a new acquisition process. In this direction, GAO (2005) argues that:

An acquisition function that is successful at effectively and efficiently meeting the agency’s mission generally reflects a consistent, cross-functional, and multidisciplinary approach. This approach requires engagement by all relevant stakeholders, including representatives from program offices, contracting officials, financial managers, human capital officials, information technology officials, and other appropriate participants. An integrated approach helps agencies better define their needs and identify, select, and manage providers of goods and services. [Government Accountability Office, 2005:6].

Therefore, it was noted that, also within the US federal agencies, the interaction among all sectors involved in the acquisition process is a critical factor for the success of the acquisitions. This interaction should also be extended to suppliers for the procurement of public goods and services more efficiently (Gansler, Lucyshyn and Ross, 2003; Carter and Stewart, 2006). In addition, the analysis of the structure of the purchasing area also encompasses its operation, that is, its departmental organization, shown in figure 1.

**FIGURE 1** STRUCTURE OF A PURCHASING SECTOR OF A MEDIUM-SIZED ORGANIZATION



Source: Elaborated by the authors based on Baily and collaborators (2008:80).

The chief buyer is responsible for the most important decisions in the purchasing sector, involving all procurement planning, while the other buyers must be specialized to handle a specific range of

items, in order to avoid duplication of research and negotiation efforts in the factory level, and to reduce the time in acquisition costs (Baily et al., 2008).

## 2.2 HUMAN RESOURCES

Tassabehji and Moorhouse (2008) describe that the contemporary buyer must assume a strategic role in the business in face of the awareness of the companies' top management that he/she manages a large volume of resources and is involved in decisions that directly affect the future of the organization. Baily and collaborators (2008:425) demonstrate the stages of development through which the buyer profile has evolved, which is shown in chart 2.

**CHART 2 BUYER PROFILE DEVELOPMENT STAGE**

Development Stage	Buyer general characteristics and responsibilities
Primitive	No special qualifications; Bureaucratic approach; About 80% of the time is devoted to bureaucratic activities
Awareness	No special qualifications; Some basic shopping routines; 60-79% of the time is devoted to bureaucratic activities.
Development	Formal academic qualifications required; Involvement in negotiations; Recognition of purchasing functions and supplies; 40-59% is devoted to bureaucratic activities.
Maturation	Management qualification required; Most of the work devoted to negotiating and reducing the cost / development of suppliers; 20-39% of the time is devoted to bureaucratic activities.
Advanced	Professional or post-graduate qualification is required; The buyer is more involved with the more strategic subjects of work; more dedicated to the total cost of acquisition, management of the supplier base etc.; Less than 20% of their time is dedicated to bureaucratic activities.

**Source:** Baily and collaborators (2008:425).

According to chart 2, the evolution of the buyer's profile has been requiring less time for this professional in operational activities, concentrating his/her activities on topics of more strategic relevance. This is due to the valuation of the purchasing sector by the company's management, but this situation was not verified by the GAO (2007) when analyzing the American federal agencies:

Agency leaders have not recognized or elevated the importance of the acquisition profession within their organizations, and a strategic approach has not been taken across government or within agencies to focus on workforce challenges, such as creating a positive image essential to successfully recruit and retain a new Generation of talented acquisition professionals. [Government Accountability Office, 2007:10]

According to Motta (2010), the lack of a structured career in the area of public procurement does not attract new professionals. In addition, the fact that the purchasing area is a constant target of the supervisory bodies creates a perception of risk for the servers and inhibits any attempt to innovate to improve the efficiency of the acquisition processes. In this respect, Burleson and Wilson (2007:12), when analyzing the public purchasing system in the United States, emphasize that the reform of the system is precisely due to the greater autonomy of the public purchaser: *“Reform should be designed to allow more creativity and focus on Proactive streamlining to allow contracting officers to support their missions more effectively and efficiently.”*

Batista and Maldonado (2008) also point out that the lack of full understanding of the bidding legislation, as well as the lack of constant recycling and training programs, inhibits a proactive attitude of buyers, directly affecting the efficiency of purchases.

### **2.3 PURCHASING PROCESS**

There is no specific legislation that deals with private purchases, and therefore, a company’s purchasing sector does not follow a rite pre-established by law, allowing greater flexibility for organizations to establish their own procedures of action, unlike what occurs in the public sector that follows legislation that has been considered excessively complex and rigid (Carvalho, 2005; Motta, 2010; Rosilho, 2011). On the other hand, GAO argues that “acquisition processes should be sufficiently flexible to address unforeseen external events and emergencies” (Government Accountability Office, 2005:14).

The activities of definition of demand, specification and planning of purchases correspond to the planning phase, that is, the internal phase of the process. Because of its complexity, it has been pointed out in the literature as the one in which a greater consumption of time is demanded for its preparation (Silva and Rocha, 2006; Gonçalves, 2012; Castro, 2014). In this sense, with the advancement of information technology, the use of computerized purchasing systems has been fundamental to minimize errors, reduce costs and stimulate the purchasing process (Baily et al., 2008; Vaidya and Campbell, 2014).

### **2.4 PURCHASING SYSTEM**

Baily and colleagues (2008:371) argue that “the advent of information technology (IT) and more integrated software systems has radically changed the purchasing arena.” For this reason, the purchasing systems underwent periods of improvement in a way that, at present, is presented in an integrated way, providing the achievement of greater efficiency. Chart 3 highlights the stages of evolution of the purchasing function according to the pattern of the information system.

According to Andrade (2004), the advent of EDI boosted the emergence of e-commerce, which means doing business online and using digital information as a mechanism to understand, design and satisfy customer needs. Through this form of business, there is an economy of paperwork and time spent with faxing, and an avoidance of unneeded calls and shifts of buyers or sellers.

Nevertheless, Bowersox, Closs, and Stank (2000:14), warn about the risks of using computerized purchasing systems primarily in reliance on real-time connectivity and the vulnerability of strategic integration, information sharing, and technology investment.

### CHART 3 STAGES OF EVOLUTION OF THE PURCHASING FUNCTION AND PATTERN OF THE INFORMATION SYSTEM

Stages of the purchasing function	Information system pattern
Primitive	Simple office work, not properly integrated. Maintenance of few records.
Awareness	Recognition of important information in the purchasing area. Beginning of the use of computerized systems, but not integrated with other systems of the company.
Development	Beginning of the use of more integrated systems, such as Material Requirement Planning (MRP). <sup>4</sup> Integration of the computerized system of purchases with others of the company
Maturation	Database fully integrated into the organization, for example, MRP II. <sup>5</sup> All purchasing information is computer generated.
Advanced	Fully integrated databases are connected via electronic data interchange (EDI) with leading suppliers and customers, resulting in a dramatic reduction in lead times. <sup>6</sup> and costs.

Source: Baily and collaborators (2008:372).

Siasg incorporated these concepts of integrated information system of the private management and, adapting them to the needs of the public service, promoted through electronic trading a greater celerity of the external phase of the purchasing process (Fernandes, 2005; Santana, 2013).

### 3. METHODOLOGICAL PROCEDURES

The present research consists of a theoretical review about the purchasing function and it is classified as descriptive and documentary (Gil, 2007). A survey of all documentation of the purchasing processes was conducted, where the preponderant factors for the lack of celerity of these processes were observed, analyzed and interpreted. As a technical procedure, a field survey was carried out, through visits to the sectors, with the purpose of conducting interviews with the main public agents involved in the most relevant sub-phases of the acquisition process. Thus, five members of the purchasing sector were interviewed, two representatives from the requesting sectors and three auction criers. Regarding the delimitations of the work (Gil, 2007), in the temporal aspect, the research tried to follow the processes of purchases initiated and concluded in the year 2014, because it is the year with more recent and complete information.

Regarding the scope, the research universe consists of a set of 38 electronic procurement processes made in 2014, the sample of 14 processes being defined by the criterion of relevance and standardization when dealing with purchases of basic items for the maintenance of the activities of the Bant and which are usually repeated annually.

Regarding the approach, the research is classified as quantitative and qualitative, since statistical tools were used as the basis of the data presentation process, such as tables and graphs, using the Pareto Diagram,

<sup>4</sup> MRP is the acronym for material requirements planning (Baily et al., 2008).

<sup>5</sup> O MRP II is an enhancement of MRP (Baily et al., 2008).

<sup>6</sup> *Lead time* is a space or time interval required to perform a process or series of operations (Baily et al., 2008).



as well as conducted interviews with the participants in the Bant procurement process. The interviews were semistructured so as to allow access to information beyond those initially listed, providing a better and deeper clarification on the topic addressed (Tomar, 2007), and the scripts were elaborated based on the theoretical framework adopted. By way of conclusion, the summary result of these analyzes led the researcher to achieve the general objective of the research and was presented through the Ishikawa Diagram.

#### 4. PRESENTATION OF DATA AND DISCUSSION OF RESULTS

Bant has a total of approximately 2,000 military personnel and a patrimonial area of over 13 million square kilometers, being considered the largest Air Base of the Aeronautical Command. It is also up to Bant to provide medical care to the reserve’s military and their families, around 15,000 people. In order to acquire the necessary inputs to fulfill its mission, it is incumbent upon SLCC, composed of 14 public agents, to coordinate, execute and control the activities related to biddings (article 142 of Rica 21-9). According to the relevant legislation, it was possible to map Bant’s procurement process in order to define its main phases and sub-phases, as well as those responsible, according to chart 4.

**CHART 4** DESCRIPTION OF THE PHASES AND SUB-PHASES OF THE ELECTRONIC TRADING FLOOR AND RESPONSIBLE AGENTS

PHASES	SUBPHASES	TEMPORARY LAPSE	AGENTS
1. INTERNAL	1.1 Composition of the Administrative Management Process (PAG)	Between the arrival of the purchase requisition, opening of the PAG and return to the purchasing sector	Requisites, Internal Control Agent (ACI) and members of SLCC
	1.2 Elaboration of the notice draft	Between the opening of the PAG and the elaboration of the edict for sending to the Legal Consultancy of the Union of Rio Grande do Norte	SLCC's members
	1.3 Legal analysis of the notice	Between the issue of the PAG to the CJU-RN and its receipt by Bant	CJU-RN's reviewers
	1.4 Correction of the public notice	Between the receipt of the PAG by Bant and the publication of the public notice	SLCC's members
2. EXTERNAL	2.1 Opening of the trading session	Between the publication of the notice and the opening of the trading session	Broker
	2.2 Bidding and Award of the object	Between the opening of the trading floor and its award	Broker
	2.3 Homologation of the event	Between award and approval	Chief authorising officer empowered to validate expenditure

Source: Elaborated by the authors.

After defining the most significant sub-phases of the purchasing process, the number of days required to execute them was identified, as shown in table 1.

**TABLE 1** TERM, IN DAYS, OF THE REALIZATION OF SUBPHASES OF BANT ELECTRONIC TRADING SESSION IN 2014

Trading floor	Subphase 1.1	Subphase 1.2	Subphase 1.3	Subphase 1.4	Subphase 2.1	Subphase 2.2	Subphase 2.3	Total
010/2014	37	27	22	9	13	32	0	142
011/2014	26	38	23	9	13	22	0	133
015/2014	7	38	19	10	12	14	15	115
017/2014	25	30	33	8	15	36	15	162
018/2014	22	28	17	12	13	23	0	115
020/2014	7	44	22	9	13	78	4	176
022/2014	73	18	28	9	13	49	1	173
025/2014	11	4	27	7	13	23	0	74
026/2014	11	8	23	12	10	17	1	83
028/2014	10	23	29	6	13	16	1	97
033/2014	27	7	11	8	13	45	5	117
038/2014	21	28	9	21	13	2	5	99
040/2014	17	7	23	21	13	8	1	87
050/2014	15	8	6	23	18	57	12	140
<b>Average</b>	<b>22.1</b>	<b>22.0</b>	<b>20.9</b>	<b>11.7</b>	<b>13.2</b>	<b>30.1</b>	<b>4.3</b>	<b>124.3</b>
<b>Maximum Number</b>	<b>37</b>	<b>44</b>	<b>33</b>	<b>23</b>	<b>18</b>	<b>57</b>	<b>15</b>	<b>227</b>
<b>Minimum Number</b>	<b>7</b>	<b>4</b>	<b>6</b>	<b>6</b>	<b>12</b>	<b>2</b>	<b>1</b>	<b>38</b>
<b>Standard deviation</b>	<b>16.4</b>	<b>25.5</b>	<b>7.5</b>	<b>5.4</b>	<b>1.7</b>	<b>20.2</b>	<b>5.4</b>	<b>82.2</b>

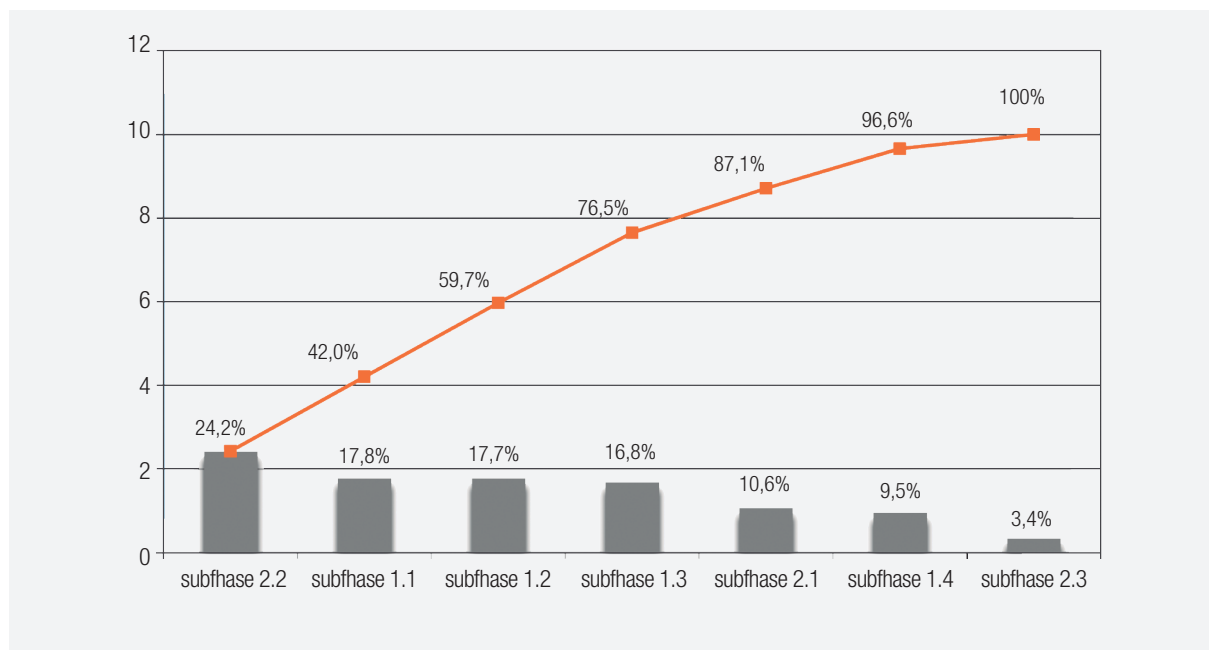
**Source:** Elaborated by the authors (2015).

The analysis of the table initially reveals a large variation in the total number of days required for the electronic trading sessions in Bant, with a minimum of 74 days and a maximum of 176 days, a variation of more than 100%. On the other hand, hypothetically it would be possible to hold the contest in up to 38 days if we consider the sum of the minimum deadlines obtained in each of the subphases.

It should be noted that Decree No. 5,450/2005 establishes minimum deadlines to be respected by the auctioneer: in subphase 2.1 (Opening of the trading session), §4 of article 17 establishes that the auctioneer must respect the time of at least eight days between Publication of the announcement and the beginning of the bidding phase. In sub-phase 2.2 (Bids and award of the object), in accordance with article 26, if the solicitor accepts the intention to appeal his actions, the period of three working days must be respected for the reasons of the applicant and another three working days for manifestation of counterarguments by the other participants.

When applying the Pareto diagram, it was necessary to proportionally match the average timeframes of the subphases in order to identify which of these together represents 80% of the total time period, as shown in figure 2.

**FIGURE 2** PARETO DIAGRAM FOR THE SUBPHASES OF THE ELECTRONIC TRADING SESSIONS



Source: Elaborated by the authors.

From the analysis of the diagram, it is possible to identify that subphases 2.2 (Bidding and adjudication of the object), 1.1 (Composition of PAG), 1.2 (Elaboration of edict), 1.3 (Legal analysis) are responsible for the consumption of about 80% of the time of the Bant electronic trading floor. Therefore, according to the Pareto diagram, it is necessary to concentrate efforts on these four subphases in order to solve the causes that influence in the lack of celerity of the electronic trading floors.

According to the data presented and comparing the studies presented by Santana and Santos (2007), Faria (2009) and Gonçalves (2012), it is concluded that Bant's purchases demanded a term three times higher than the average of the other organizations (15 days in organizations versus 48 days in Bant).

In the next subsections of this article, we will analyze the factors that cause the lack of celerity in the main subphases identified in the Pareto Diagram, relating them to the four dimensions of analysis, adapted to the organization being studied.

#### 4.1 STRUCTURE AND ORGANIZATION OF SLCC

According to the characteristics indicated in the description of the evolution profile of the purchasing department (table 1), Bant's purchasing sector falls into the second evolutionary stage and is classified as having a tactical profile. The lack of elevation of the hierarchical status of the sector impairs the

allocation of financial and, mainly, human resources and indirectly influences the existence of preponderant factors for the lack of celerity of the trading sessions.

Regarding the integration among those involved in the purchasing process, one of the critics stated that “rarely, of its own free will, the requesting sector follows the acceptance (of the proposals) in the trading session. Most of the time, the crier has to ask, request the presence of the requesters,” a perception confirmed by the other two criers. The participation of a specialist on the side of the broker would promote greater speed in this phase of the process, due to the knowledge that the requester has about the product being negotiated.

As for the composition of the purchasing process, subphase 1.1, purchase requisitions arriving at SLCC are not rare, such as erroneous or incomplete description of items, reference prices totally out of market value, items without the Catalog Number of Material (Catmat) or with incorrect number and standardization errors, as stated by the interviewees. These types of errors were agreed in this work to call “operational failures”, which interfere directly in the speed of the process and the lack of a greater integration between the sectors potentiates the problem.

Therefore, it is concluded that operational failures and the lack of integration between the purchasing sector and the requesting sectors affect the speed of subphase 1.1 (*PAG Composition*). On the other hand, the lack of integration between the requestors and the criers affects the speed of subphase 2.2 (*Bids and adjudication of the object*).

#### **4.2 LACK OF QUALIFIED STAFF**

All respondents confirmed that there is a shortage of personnel in the purchasing sector, which ultimately undermines the performance of the entire process. When asked if the number of people to develop their work was sufficient, one of the respondents answered: “No, because it’s just me, if there were more people, the execution would be faster.” It was verified that only two auctioneers are allocated in the purchasing sector and that this circumstance symbolizes a situation of great relevance: that the Bant criers do not have their main activity in the purchasing function and, therefore, this is contrary to Baily and collaborators (2008) in figure 1. Since they do not focus exclusively on the execution of their trading sessions, they tend to be less rapid. All criers interviewed reported that the role of buyer turns out to be a secondary function and that they worry, as a matter of priority, with their management activities that are much more extensive and complex than those related to the execution of the trading session. Finally, all of them concluded that the accumulation of functions occurs due to the shortage of qualified personnel that ends up harming the speed of subphases 1.1 (Composition of PAG), 1.2 (Elaboration of draft edict) and subphase 2.2 (Bids and adjudication of the object).

It was also certified that there is a lack of investment in the training of professionals in the purchasing sector and also in the criers. In this regard, Motta (2010) emphasized that the lack of consideration for the importance of the human factor in the acquisition process is a reality within the Brazilian purchasing system:

In fact, the Brazilian federal system has concretely two main elements: the legislation and SIASG/Comprasnet. The human variable is not very relevant in the current context and the knowledge accumulated in the last decades in the fields of Logistics, Supply Chain Management and Purchasing is practically unknown at the federal scope. [Motta, 2010:161]

All the interviewees affirmed that there is a need to update knowledge through courses and that lack of knowledge influences the speed of the process, since it takes time to look for the norms, decisions and jurisprudence of the courts that guide their decisions in the process. According to the statements, Bant does not have a policy of investments in its human resources linked to the purchasing department, so that there are interviewees who work in the sector, who develops the composition phase of the PAG, for example, and who have never done any type of course in the purchase area.

In sum, it is possible to conclude that the scarce investment in qualification of the professionals involved in the purchases is one of the factors that predominantly influence the execution of the subphases 1.2 (*Elaboration of the edict draft*) and 2.2 (*Bids and adjudication of the object*) of the electronic trading floor.

#### 4.3 PUBLIC PROCUREMENT PROCESS

The rules that underpin the public procurement process are wide and, depending on the type of material, other more specific rules are part of the composition of the bidding document. In the interviews, all criers were unanimous in stating that most of the time, because of the excess and rigidity of the norms, still carry out many more operational activities such as preparation of spreadsheets and price registration minutes, answers at the request of clarification and challenge of public bidding, consultations with regulatory agencies and controllers to verify bidders' documents, as well as other procedures, revealing that the profile of these buyers can be characterized as "conscientious" when the ideal would be the "advanced", as shown in table 2.

In addition, all the criers were unanimous in affirming that the excess and rigidity of the norms are also factors that provoke the delay in the analysis of the edicts and in the consequent emission of the opinion made by the CJU-RN. Therefore, it is possible to conclude that the excess and rigidity of the norms are factors that directly affect the speed of subphases 1.2 (*elaboration of draft edict*), 1.3 (*legal analysis*) and 2.2 (*Bidding and adjudication of the object*).

Another relevant aspect that contributes to the lack of speed of the processes is related to the quantity of items tendered. In this regard, the head of the purchasing sector explained in more detail:

[...] to make a bid, a person has to enter all the items that we will bid in the federal government procurement portal to make the intention to record prices. So, for example, our building material auction has about 700 items and then my graduate will have to type one by one these 700 items in the system and then do a review to check if there was no typing error. [Interviewee]

The quantity of items also influences the verification time of the proposals, since, according to the cited example, the broker has to check each of the items in the proposals of the suppliers to proceed with the award, which logically takes longer than verifying proposals for a floor with 10 items, for example. Therefore, it is concluded that the number of items in the trading sessions predominantly influences the speed of subprojects 1.1 (composition of the PAG), 1.2 (*elaboration of the bidding document*) and 2.2 (*Bidding and adjudication of the object*) of the electronic trading session.

#### 4.4 PURCHASING SYSTEMS

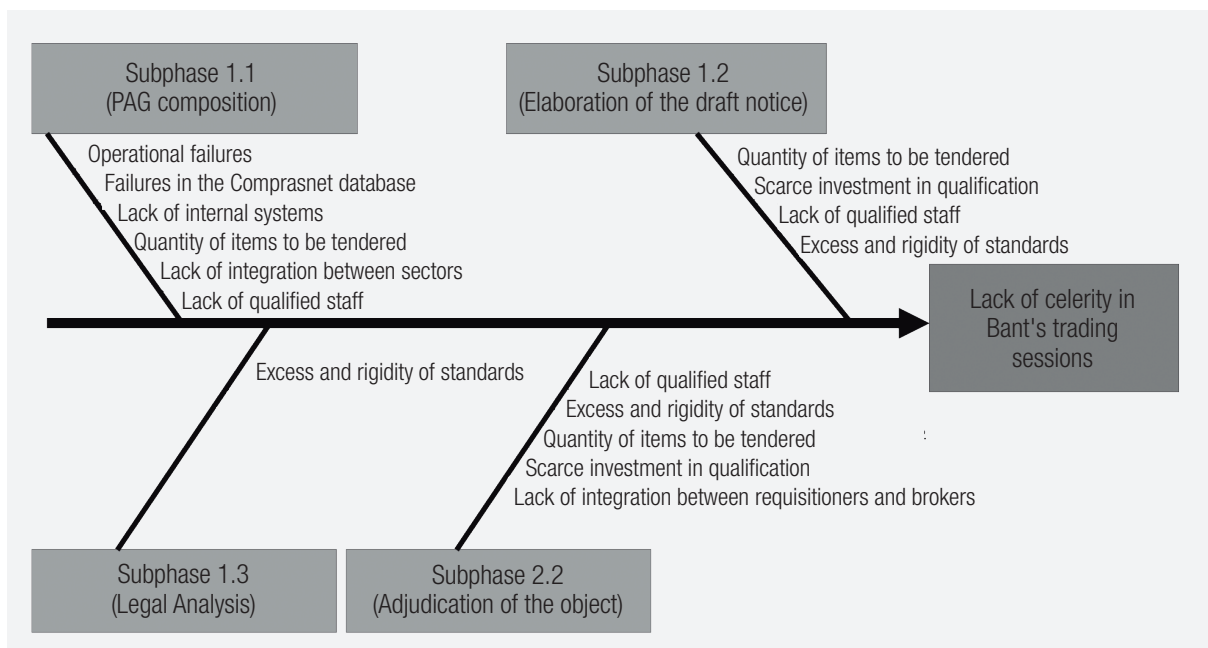
Regarding the purchasing systems, it was verified that the organization does not have an internal computerized system capable of expediting the issuance of requests for the acquisition of goods and services and there is a need, for example, for double typing, one by the requesting sector and another from the purchasing sector, as well as other tools that could be useful for the more agile development of the process, such as integration with Siasg. Thus, the absence of an integrated internal system is one of the causes of the delay in the subphase 1.1 (PAG Composition).

In terms of external systems, the organization uses essentially Siasg/Comprasnet, in which the trading floor is operated. His performance was recognized by the vast majority of users interviewed as a very good system and, in the words of one of them: “[...] for the crier, the system is excellent, it is easy to use.”

However, regarding the specification of the items to be acquired, the interviews point out that this is one of the biggest obstacles faced by the organization’s purchasing area. Although the Siasg system provides a wide range of specifications of the most varied types of material and service, in the opinion of one of the requisites: “The Comprasnet database is deficient. You have to tailor your request to the specifications available in the system.” In addition, respondents — one of the members of the purchasing sector and one of the critics — corroborate the understanding that Comprasnet’s database needs improvements. Therefore, it is possible to conclude that faults in the Comprasnet database hamper the speed of the process in subphase 1.1 (PAG composition).

In view of the analyzes carried out based on the theoretical framework adopted, it is possible to draw up a cause-and-effect diagram, according to figure 3, which allows a quick visualization of the factors that influence, mainly, the execution of the subphases of the electronic auction in Bant as per the principle of celerity.

**FIGURE 3** ISHIKAWA’S DIAGRAM ON THE PREVAILING FACTORS FOR THE LACK OF CELERITY OF THE BANT ELECTRONIC TRADING FLOOR



Source: Elaborated by the authors.

In relation to the factors pointed out by the lack of speed of the electronic trading sessions, it was possible to conclude that the lack of qualified personnel for the purchasing sector and the excess of rigidity and formalism of the legislation were the factors that most generated impacts in the execution time of the processes. However, the good news is that, other than the “excess and rigidity of the rules” and “failures of the database of Comprasnet”, the other factors preponderant to the lack of speed of the trading sessions can be solved by the organization itself when looking for, firstly, recognize the purchasing sector as a strategic function within the organization and subsequently proceed to reorganize the purchasing area, mainly in the sense of allocating sufficient qualified personnel to the sector, besides investing in the qualification of those agents involved in all subphases of the process.

## 5. FINAL CONSIDERATIONS

In general, with the advent of electronic trading, there has been a greater speed of public procurement processes, but only in relation to the external phase of the processes. The electronic procurement process as a whole is still recognized as a complex and time-consuming process due to several factors. With a focus on the study of the four dimensions adopted in the theoretical framework, it was possible to identify strategic elements of the purchasing function that can be applied to public management. In this sense, from the point of view of the dimension “Structure and organization of a purchasing sector”, it is concluded that there is a need for the purchasing area to be recognized as a strategic function within the public administration, that is, it must be given greater importance to the purchasing sector within public organizations. The change in the status of the sector within Bant would provide better conditions for the improvement of the procurement process, such as the development of integrated internal systems and the allocation of qualified personnel for the sector, which was identified within the dimensions Public “procurement” and “specialized human resources”, respectively. Also part of this change is the greater participation of the purchasing sector and the criers in the formulation of strategic planning of the purchases of the organization, making the buyers of the unit start to exercise a much more strategic than bureaucratic function within the purchasing process, according to analysis based on the “Purchasing Process” dimension.

Among the factors pointed out by the specialized literature, the research presents an advance in identifying causes that influence the scope of the principle of celerity by the public administration, such as the “lack of integration between the requisitioning and the purchasing sector”, the “lack of integration between the requesting sector and the crier” and “failures of the Comprasnet database”. In order to make these new factors known, in addition to the contribution of the adopted framework, it was fundamental to opt for the analysis of the process by subphases, a procedure unexplored by the literature, which allowed to establish a greater focus on each of the main steps of the process. Thus, these new factors, perhaps already existing, could be camouflaged in other studies on the speed of processes, and in turn, subphase analysis allowed them to surface. Moreover, this type of analysis also provided a greater consistency in confirming the factors that contribute to the lack of celerity of public purchases.

Finally, it is concluded that the search for minimization, or even elimination, of the factors that undermine the scope of the principle of celerity must be sought by the administrative body of the federal public agencies, as well as in Bant, enabling organizations to fulfill their mission with excellence.

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