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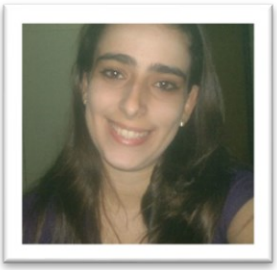

Information management in electronic trading processes in a Federal Institution of Higher Education

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ABSTRACT

Introduction: The electronic auction is a type of bidding for the acquisition and contracting of common services and its use by public bodies, including Federal Universities, is mandatory. The electronic trading process is formed by information that has strategic value used for organizational learning and better decision making. Objective: This research aims to analyze how information management is characterized in electronic trading in a Federal Teaching Institution. Methodology: The study will be carried out at the Federal University of Alagoas, the largest public education institution in the State of Alagoas. The research is characterized by being descriptive with a qualitative approach, thirteen civil servants who work in electronic trading were interviewed, using a semi-structured questionnaire as a data collection instrument. The questionnaires were constructed using the information management model of Choo (2006). Content analysis was performed as a data investigation method. Results: The main information needs were identified as: description of the material or services, price quotation and purpose of the acquisition. Personal sources are the most used by servers in resolving doubts in the process. There is no easy access to information from other sectors and information products and services are outdated and not very detailed for some users. Conclusion: The research is relevant because it analyzed the information management in the institution, which can bring improvements in the use of information, in the elaboration of information products and services from the informational needs of purchase requesters.

KEYWORDS

Information management. Strategic information. Government purchases. Electronic procurement.

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Gestão da informação nos processos de pregão eletrônico em uma Instituição Federal de Ensino Superior

RESUMO

Introdução: O pregão eletrônico é uma modalidade de licitação para aquisição de bens e contratação e serviços comuns sendo obrigatório sua utilização pelos órgãos públicos, incluindo as Universidades Federais. O pregão eletrônico é composto por informações de valor estratégico para aprendizagem organizacional e a melhor tomada de decisão. Objetivo: Esta pesquisa teve como objetivo analisar como se caracteriza

a gestão da informação nos pregões eletrônicos em uma Instituição Federal de Ensino Superior. Metodologia: O estudo foi realizado na Universidade Federal de Alagoas, maior instituição de ensino público do Estado de Alagoas. Tratou-se de pesquisa descritiva com abordagem qualitativa, foram entrevistados treze servidores públicos que atuam nos pregões eletrônicos como instrumento de coleta de dados. Foi realizada análise de conteúdo como método de investigação de dados. Resultados: Foram identificadas as principais necessidades de informações dos servidores nos pregões eletrônicos como sendo: descrição do material ou serviços, cotação de preços e finalidade da aquisição. As fontes pessoais foram as mais utilizadas pelos servidores na resolução de dúvidas no processo. Não houve um acesso fácil a informações de outros setores e os produtos e os serviços de informação estavam desatualizados e pouco detalhados para alguns usuários. Conclusão: A pesquisa é relevante pois analisou a gestão da informação na instituição, podendo trazer melhorias no uso da informação, na elaboração de produtos e serviços de informação a partir de necessidades informacionais dos solicitantes de compras.

PALAVRAS-CHAVE

Gestão da informação. Informação estratégica. Compras governamentais. Pregão eletrônico

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1 INTRODUCTION

Government purchases are essential for the functioning of the basic activities of the State, as they aim to meet the needs of citizens in the provision of public services. According to Souto, Arruda and Araújo (2019, p. 48), procurement processes are objects of interaction between the Government and society, "[...] as it maintains the supply of materials and services necessary for the proper functioning of public administration institutions". Maintaining proper functioning in public agencies is important for the provision of quality public services, and public procurement can be a means of achieving social purpose.

Amorim (2017) defines government procurement as all contracts that are possible to the public sector, for example, acquisition of goods, contracting of services, disposal of movable and immovable property, among other forms. For the execution of government purchases, the government uses public tenders to achieve institutional objectives. For Costa, Chaves and Mazzo (2020, p. 98) bidding is the administrative procedure in which the government "[...] opens to all interested parties, who are subject to the conditions set out in the call for proposals, the possibility of formulating proposals, among which it will select and accept the most convenient for the conclusion of a contract".

There are some bidding modalities in the Brazilian legal system, one of which is the electronic trading session. This modality aims at the acquisition of common materials or services, that is, those that have clear descriptions and that more than one supplier can sell and deliver. According to Costa, Chaves and Mazzo (2020, p.98), electronic trading is the most used bidding method in the country's procurement process.

The electronic trading session modality consists of procedures and documents composed of information prepared by public servants and suppliers who work in the process, so information in public organizations has been strategically gaining space "[...] seeking to innovate and improve its services in the face of this new society in which information gains prominence and relevance" (Santos, 2019, p.15).

In order for information to be applied in fulfilling institutional purposes, it must be used strategically, because according to Davenport (2002, p. 65) managers "[...] will create strategies regarding the types of information that should be focused, the activities to be emphasized and the way information can help the company achieve its goals". It is at this point that the need arises to manage information from the search for information to its effective use, which we call information management.

Information management in the practical concept "[...] is a process that seeks to add value to information, using the mechanisms of selection, analysis, storage and dissemination so that information is used in decision making and organizational processes" (Carvalho; Araújo Júnior, 2014, p. 73).

In this theme we understand the importance of information management in organizational contexts in the public and private spheres, including Federal Universities. In these environments, there is information production in their organizational processes which require efficient information management for its proper use, with the purpose of improving the public services provided by the institution.

In the electronic trading there is production of information necessary for the instruction of the process and decision making at each stage of the bidding. In this context, information management can identify the information needs of the requesting units, in addition, it can assist in the production of information, understanding of the information sources used, in addition to the elaboration of information products and services.

Given this scenario, the objective of this article is to analyze how information management is characterized in electronic tradings in a Federal Institution of Higher Education. The study was conducted at the Federal University of Alagoas because it is the largest institution of higher public education in the State of Alagoas. It was a descriptive research with a

qualitative approach. Thirteen public servants who work in electronic trading were interviewed. The questionnaires were constructed based on the steps detailed in Choo's (2006) information management model.

2 LITERATURE REVIEW

The theoretical framework was built by scientific productions focused on the areas of information management, public bidding and electronic trading. The bibliographic survey for the literature review was carried out between February 2021 and March 2022 in the databases of the Information Science Database (BRAPCI) and Google Scholar.

2.1 Information management

Information management is related to two distinct but complementary areas. Information Science and Administration have a relationship "[...] are recognized as Applied Social Science and, therefore, transcend the theoretical and epistemological issues about the circumstantial territory of an information product that provides organizational development". According to the authors, a practical process of interconnection between the areas is possible (Alves; Duarte, 2015).

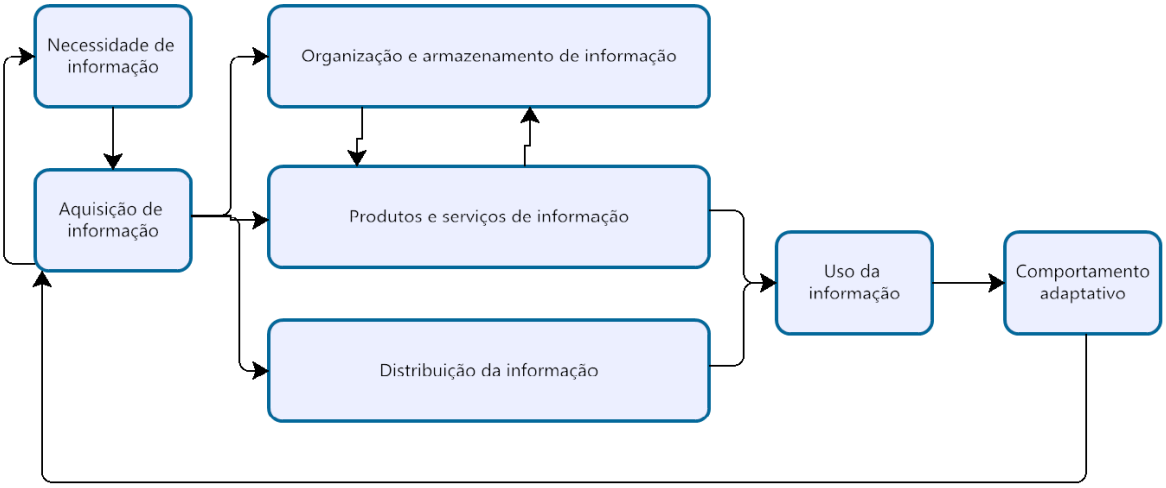
Information management then, according to Jääskeläinen et al. (2020, p.3) is a systematic process that provides support to the organization's employees, so that it can create meanings of data and information and implement decision-making. For Ferreira, Jardim and Ziviani (2018, p. 52) information management "[...] reveals itself as an important strategic method for organizational performance, since it seeks to understand the information needs and intensifies the resources used, guiding them to learn and adapt to the demands imposed by the environment".

For Davenport (2002), information management is a structured set of activities that show how companies seek, distribute and use information, and most importantly, identify all the sources involved, all the people who affect each step, all the problems that arise and this can point the way to changes that can make a difference.

In the literature there are several models of information management, such as the models of McGee and Prusak (1994), Davenport (2002), Choo (2006) among others. Models are "[...] simplified representations, through which certain aspects of reality are glimpsed and better understood, are schemes that represent reality in an approximate way" (Rocha; Duarte; Paula, 2017, p.38). So that we can analyze a reality, the models can be used as a basis for observation in a concrete case.

The model used in the study was that of Choo (2006), as it is conceptually robust, widely validated and referenced in several works such as Dutra and Barbosa (2020) and Ponjúan Dante (2011). For Choo (2006) information management should be seen as a process that creates, organizes, distributes and uses information. And its cycle is formed by the stages of: identification of information needs, acquisition of information, organization of information and storage of information, development of products and services, distribution of information and finally, the use of information. Figure 1 shows Choo's (2006) information management model:Savazoni (2019) alerta que os laboratórios cidadãos podem ter semelhanças com outros laboratórios colaborativos de produção de conhecimento aberto surgidos no começo do século XXI, tais como, *living labs, fablabs* e *makerspaces* (Savazoni, 2019):

Figure 1. Process model of information management - Chun Wei Choo



Source: adapted from Choo 2006, p. 404

In information needs identification there will be an assessment of the information needs of the groups in an organization. In the acquisition of information is the time to search for the information that individuals in an organization need to solve a problem. You should use informational sources, which according to Choo (2006), should be varied and controlled by the institution, and may be textual sources, online, electronic databases and personal sources. In the organization and storage of information, when the information is acquired, it must be organized and finally stored.

The activity of information products and services will be used by users for the understanding of the problem, but also for the possible solutions of this issue, that is, not only to understand the problem, but for "an orientation towards action" (Choo, 2006, p. 412). Information distribution, according to Choo (2006, p. 414) is the way information is disseminated in the organization, "[...] so that it reaches the right person, at the right time and in the right format".

The use of information aims at the cycle of creating meaning, generating knowledge for decision making, thus, Choo (2006) expands the scope of information allowing it to be used to direct an action or solve a particular problem.

2.2 Elements of information management

In line with Choo (2006), the first step in creating an organizational strategy is to properly assess the information needs of individuals in the organization. To identify the needs correctly, it is suggested to seek them in the subjects who perform the respective functions and what information is necessary for their performance.

It is essential that the agent of the activity has the domain of it, otherwise, it is likely that he will not know how to identify the possible needs, according to Santos (2019, p. 33) "[...] the identification of need concerns the act of the individual knowing the sources of information in which he is inserted, recognizing his tasks and what types of information he needs to perform them".

The acquisition of information is triggered by informational needs. There are some theories and models in usage studies that can explain how there is the search for information. Dervin (1992) has the theory of sense making in which the need for information is based on human beings' own changes in relation to everyday situations. An information need is

characterized by "the absence of meaning or significance so that the individual must assign a new meaning to each new information gap" (Moreira; Silva, 2020, p.365).

The organization and storage of information occurs when the information of an institution is organized and structured in a support so that later, they can be obtained by the people who perform activities. For Choo (2006, p. 409) this organization of information can bring an ease in sharing information and its retrieval, "the way information is stored reflects how the organization perceives and represents its environment. These processes should also be carried out under a defined parameter so that it does not make it impossible to obtain the information later. According to the author, the way information is structured shows how the institution characterizes its environment, specifies its relationships and evaluates its performance.

During these processes, the recording of information is a form of externalization of knowledge, and according to Nonaka and Takeuchi (2008, p. 62) it is "a process of articulating tacit knowledge into explicit". The authors also argue that "[...] documentation helps individuals to internalize what they have experienced, thus enriching their tacit knowledge [...]" (Nonaka; Takeuch, 2008, p. 67).

For Choo (2006), explicit knowledge is "that which can be expressed formally with the use of a system of symbols and can therefore be easily communicated or disseminated [...]". Explicit knowledge is based on rules for record keeping, rules for information utilization and rules for planning" (Choo, 2006, p. 189).

The elaboration of information products and services is an activity that aims to produce information for the clarification of users, bringing as a consequence the fulfillment of information needs and improvement of organizational processes. Information products and services need not only to inform, but to help agents solve problems, and to include the informational needs of agents in organizational processes, according to Quintino (2019) to achieve institutional objectives, processes must be associated with the actors that compose them.

Information distribution is the process of distributing the correct content and the appropriate form to the agents that make up the institution. "It is sharing that is responsible for mobilizing information and knowledge throughout the organization [...]" (Souza; Silva, 2016, p. 203). In order for the user to use the information in their activities, there must be an adequate mechanism to disseminate the information "[...] in a clear and complete way to be put into practice as an act, reinforcing the importance of the quality of information in institutional communication [...]" (Santana; Sales; Saldanha Neto, 2021, p. 37.992).

About the use of information, when discussing process improvements, some variants are thought of, such as training members, investing in technologies, analyzing process management, among other ways, but not information management, this thought is corroborated by Davenport (2002, p. 198) in the following speech "[...] hundreds of companies have tried to improve their processes, but information-oriented methods have rarely come into focus". It is then necessary to include information management, analyzing the information needs of users until their respective use of information, such as decision making. Choo (2006, p.29) corroborates, indicating that the use of information "[...] is that in which organizations seek and evaluate information in order to make important decisions". It is the last stage of the information management cycle (Choo, 2006).

Choo (2006, p. 84) also emphasizes the importance of using information to generate knowledge, because "[...] information use is the selection of relevant messages in the broader information space, so that this generates a change in the individual's state of knowledge or ability to act".

We can conclude from the points discussed that each step is important to achieve the effective use of information in improving institutional processes and decision making. We cannot analyze the elements of information management in isolation but consider that each element is

part of the whole, for example, the information needs of users need to be appreciated so that quality information products are developed. Proper use of information is not possible without organizing and structuring information, and so on.

3 METHODOLOGY

The investigation was characterized by a descriptive study of qualitative approach (Hernández Sampieri; Hernández Collado; Baptista Lucio, 2013; Neves, 1996), because it analyzed the management of information in the processes of electronic tradings at the Federal University of Alagoas, for this, interviews were conducted with the subjects who are part of the process.

The research is a case study. According to Creswell (2010, p. 38), case studies are "research strategy in which the researcher deeply explores a program, an event, an activity [...]" researchers collect detailed information using various data collection procedures [...]".

As a field of study, electronic bidding processes were chosen because it is the most used modality at the University for the acquisition of common materials and services, in addition to being the mandatory modality for Public Universities. The choice of a bidding modality was necessary for the limitation of the object.

About the definition of the place that will be researched, for Neves (1996, p. 1) "[...] for the most part, qualitative studies are done at the place of origin of the data". That is why in this research, the study was delimited at the Federal University of Alagoas, where the data were collected. The choice was determined because the University is the largest public institution of higher education in the State of Alagoas, and its institutional function is teaching, research and extension, providing services including to the university community, in addition, the author of the study works in the Purchasing and Bidding Management in the Pro Rectory of Institutional Management - PROGINST/UFAL.

The Purchasing and Bidding Management is one of the sectors responsible for the progress of electronic tradings and is also the department where the operation of the external phase of the process is carried out (operation of the electronic trading in the Government Procurement System).

Information was observed between the phases of identifying the needs of items that make up the Annual Hiring Plan (PAC) until the phase of awarding the processes, the final moment of the operation of the electronic trading by the University's Auctioneer. Regarding the interviews, they were carried out with civil servants of the institution who act as purchase requisitioners, members of materials committees, Purchasing Managers, Auctioneers and other members who work in electronic tradings.

Interviews were conducted with civil servants between 06/01/2022 and 19/01/2022. According to Silva and Fossá (2015, p. 6) "[...] individual interviews make it possible to achieve a variety of impressions and perceptions that the various groups have in relation to the study variables". Thirteen servers who work in electronic trading sessions at the Federal University of Alagoas were interviewed. According to Flynn (2018, p. 03), it is important to collect interviews with more than one respondent "[...] the perception of one person is not adequate to evaluate a company culture because of its collective nature". [...] there is no way to determine the validity of a measure that is assessed only by individual respondents [...]".

Semi-structured interviews were collected in the remote model (Google Meet) and individually with the servers of the sectors involved. According to Creswell (2010), for qualitative research, data should be collected in person through document examinations and interviews. The semi-structured questionnaire used was based on questions that related to the information management steps of Choo's information management model (2003). Chart 1 follows - groups of respondents in the study:

Chart 1. Groups of interviewees

Interviewee group	Number of interviewees	Allocation
Requesters from academic or administrative units	1	Institute of Chemistry and Biotechnology - Campus A.C. Simões
	1	Campus Viçosa
	1	Technology Center - CTEC - Campus A.C. Simões
	1	Institute of Biological and Health Sciences - ICBS - Campus A.C. Simões
Materials committee members	1	Institute of Biological and Health Sciences - ICBS - Campus A.C. Simões
	1	Campus of Agricultural Science - CECA
Members instructing electronic trading process	1	Purchasing and Bidding Management - PROGINST - Campus A.C. Simões
	1	Purchasing and Bidding Management - Campus Arapiraca
Auctioneers	1	Purchasing and Bidding Management - PROGINST - Campus A.C. Simões
	1	Campus of Agricultural Science - CECA
	1	Purchasing and Bidding Management - Campus Arapiraca
	1	Purchasing and Bidding Management - PROGINST - Campus A.C. Simões
Supporting members	1	Contract Management - PROGINST - Campus A.C. Simões

Source: Survey data, 2022

The request for authorization to conduct interviews was requested from the Ethics and Research Committee of the Federal University of Alagoas on 10/25/2021 (process no. 52816521.3.0000.5013) and was authorized on 12/16/2021.

After the interviews, the audios were transcribed between 06/01/2022 and 28/01/2022 manually, listening to audios and transcribing in google documents. Subsequently, a first reading was carried out, observing the important points and making the observations in the transcription document itself, following the use of a spreadsheet with the pre-established categories and those created later based on the most frequent speeches.

Content analysis was used as a technique for data analysis. "It is a communications analysis technique that will analyze what was said in interviews or observed by the researcher" (Silva; Fossá, 2015, p. 2). Content analysis consists of three stages: a) pre-analysis; b) exploration of the material and c) treatment of the results (Bardin, 1977).

In the interviews with the servers, we analyzed how information management is characterized in electronic tradings. The researcher obtained formal authorization from the

Institution, and authorization from the Pro-Rector of the Pro-Rectorate of Institutional Management – PROGINST to access information from the University and to conduct interviews with the servers.

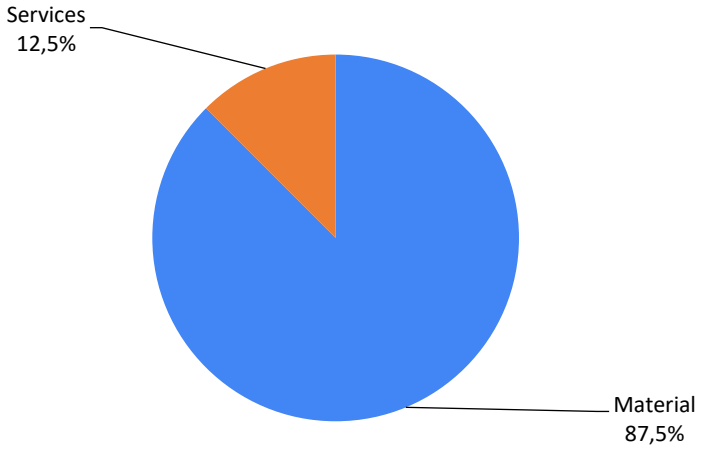
According to Paiva Júnior, Leão and Mello (2011, p. 191) the clarity of procedures "[…] is a criterion of reliability that concerns the good documentation, transparency and detail of the exposure of the procedures in the search and analysis of the results". To assist in the organization and later in the analysis of the data, the researcher used spreadsheets and graphs as a resource. The fulfillment of the validity and reliability requirements provided quality criteria to the study.

4 DISCUSSION OF THE SURVEY RESULTS

The Federal University of Alagoas (UFAL) is a federal institution of higher public education in Alagoas with the mission of offering teaching, research and extension to the university community.

There are some bidding modalities for public procurement applied at UFAL, however the main modality is electronic trading. In 2020, UFAL instructed 24 (twenty-four) electronic tradings. Of the finalized electronic tradings of 2020, most of them were for the acquisition of material, 21 (twenty-one) electronic tradings and 03 (three) for contracting services. Figure 2 follows – number of electronic tradings for materials and services:

Figure 2: Electronic procurement – materials and services



Source: Prepared by the authors based on the Integrated System of Assets, Administration and Contracts.

Regarding the activities carried out by the agents who work in electronic tradings, the interviewees were asked "what activities do you have difficulty in carrying out and why?". The purpose of the question was to verify whether the difficulties faced by civil servants were related to information management.

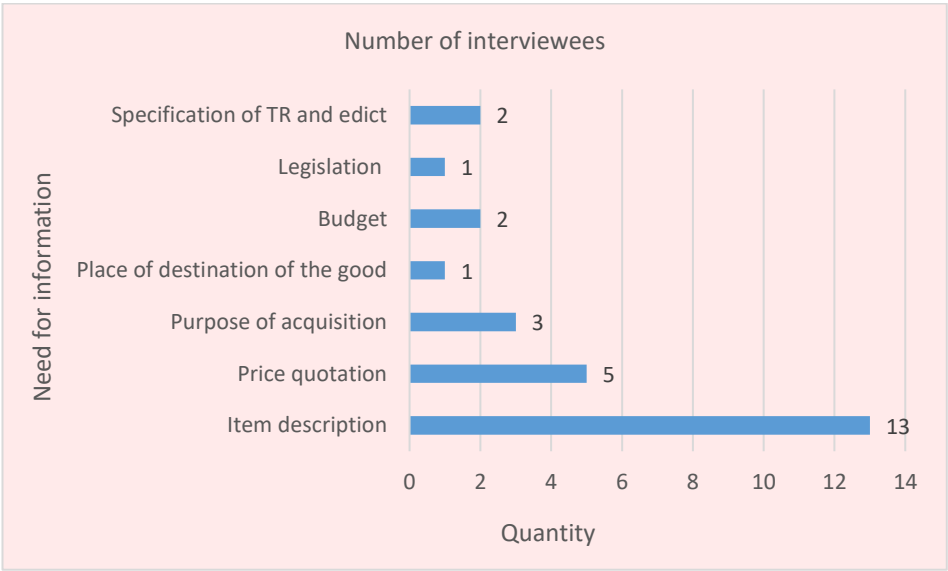
The greatest difficulties of users would be in the elaboration of documents containing information, for example, in the elaboration of justification, public notice and term of reference. The information present in these documents is prepared by those sectors or servants who use the materials or services, so it is perceived that the users who carry out the preparation of these documents do not have the knowledge about the information. It is a problem related to the need for information (to know what information is needed to make the document) and to search for and obtain information (search for this information).

It was clear that the construction of a material description is an important point for the successful acquisition of a material, because it can interfere in the price quotation, since the requisitioner of the material needs to know and describe his needs so that the acquisition can be more accurate. This can be a problem caused in the information need and information retrieval phases. As the stages of information management are related to some difficulties related to the activities of electronic trading sessions, a study is needed to describe information management at the Federal University of Alagoas.

4.1 Need for information

Some information needs were observed in the activities carried out by the interviewees in the electronic trading session, as shown in figure 3 - information needs in electronic trading sessions:

Figure 3. Information needs in electronic tradings



Source: Prepared by the authors, 2022

Figure 3 refers to the quotation that each interviewee made in each information needed. In the elaboration of the question to the interviewees, no closed options were given for response, these were said by the interviewees and organized for the construction of the figure. According to the interviewees, information from other servers or sectors is necessary for the exercise of activities, otherwise, the activities cannot be carried out, Requester 2 explained that "[...] information that demanded from Viçosa employees, teachers and technicians, so that I could elaborate the justifications, because they are different equipment and services from my daily routine [...]". Interviewee Instruction 2 explains that "[...] there will only be success if she specifies exactly what she wants from that purchase".

The main information needs found were: the complete description of the material or service to be contracted; price quotation and purpose of acquisition. It was observed that the complete description of the item was cited by all interviewees, so it is an important need for the execution of activities from the requisitioner of the unit that receives the internal demand to the auctioneers in the external phase of the electronic trading session.

The identification of the need for information can show the informational problems in a particular activity in an organization, it can bring to light some circumstance that needs to be resolved so that there is a change in action. In the context of the instruction of electronic tradings, according to the interviewees, the description of the item and the price quotation are

important information for the follow-up of the process and therefore it may be a need that should be observed by managers for, for example, a dissemination of information on how to better perform this activity, of elaboration of products and information services aimed at a more adequate construction of material specification.

4.2 Searching for and obtaining information

The servers were asked "what source of information do you seek to resolve doubts or problems in activities in electronic procurement processes that you have never experienced?". As for the preference for source of information for problem solving, the most chosen sources were found: search on the institution's website and access to the sector's colleague, followed by the use of messaging applications such as Whatsapp, going in person to the sector to answer the question and search for normative acts on the internet. Chart 2 follows - source of information by preference:

Chart 2. Summary of the information need category

Preference	Source of information
1	University website
2	Access to co-worker
3	Use of messaging applications (WhatsApp)
4	In person at the sector for clarification
5	Search for normative acts on the internet

Source: Prepared by the authors, 2022

It is concluded that, when the servers have some new situation, the choice of information sources for the resolution of the task is by close colleagues in the sector and websites of the institution. The use of close colleagues, according to some studies, can happen more frequently and therefore, this type of source should be considered in an organization: "users obtain information from many different sources, formal and informal. Informal ones, including colleagues and personal contacts, are almost always as important as or more important than formal sources, such as library and database" (Choo, 2006, p. 79). "As a result, most have verbal information as their most important sources [...] most information comes from personal contacts; the rest from telephone conversations [...]" (Davenport, 2002, p. 41).

During the interviewees' narrative, it was observed that when it comes to clarifying doubts, the University's employees preferably seek personal sources. The use of personal sources is positive so that the flow of information remains constant, the exchanges of information are important for solving problems in the daily life of institutions and the construction of knowledge.

4.3 Organization of information

The interviewees were asked: "Do you usually record the clarification of a doubt in some medium and what are these means?". The recording of information makes the knowledge visualized by the user at a given time or to facilitate the sharing to other users. Therefore, the habit of recording information can bring benefits to organizations, such as building an organizational memory, in line with Choo (2006, p. 409) "stored information represents an important and frequently consulted component of the organization's memory".

According to Nonaka and Takeuchi (2008), recording information is a form of externalization, and the practice of manuals facilitates the transfer of explicit knowledge to others. In the survey, most respondents answered that they record the clarifications they obtain in some support; being carried out as main means of registration in notebook, e-mail, spreadsheets in google drive and manuals or guidelines. Chart 3 follows - forms of information recording:

Chart 3. Ways of recording information

Ways of recording information
Manuscripts (notebooks or other forms)
E-mail
Spreadsheets on google drive
Manuals and guidelines

Source: Prepared by the authors, 2022

According to some interviewees, the recording of information is important to fix the knowledge and not need to ask the information again, otherwise it is lost as described by the interviewee Instruction 2 when he said "sometimes we learn how to do it and we don't need to be consulting anymore [...]" and the Auctioneer 2 "[...] sometimes I write it down in the email, but you need to do it, just so you don't keep asking the same thing over and over again. For Santos et al. (2019, p.34) "[...] mediating agents can encourage users to make oral tacit knowledge explicit and adopt methodologies through which they can codify and record this knowledge".

4.4 Information products and services

The question was asked: "Does the sector you work in develop information products and services? Which ones? And what is the feedback from users?". The majority of respondents answered that they develop information products and services. Among the instruction sectors and auctioneers, all responded that they develop information products and services. Among procurement requesters and committee members, half of the respondents make information products.

Generally, the information products and services carried out by the sectors are spreadsheets and guidelines published on the transparency of the UFAL website; sending emails to users; mini-courses offered within the units; manuals, checklist, information models and documents for the instruction of electronic tradings, messages by whatsapp informing the procedures. Information products and services are an example of explicit knowledge, according to Nonaka and Takeuchi (2008).

Chart 4. Information products and services realized by sectors

Information products and services
Spreadsheets and guidelines published on UFAL's transparency website
E-mails to users
Minicourses offered within the units
Manuals, checklist, information templates and documents for the instruction of electronic tenders

Messages by Whatsapp informing the procedures

Source: Prepared by the authors, 2022

It is considered that the result was positive insofar as it was verified that the academic and administrative units have the concern to develop information products and services. Regarding the feedback received from users who use these products, it was reported that they sometimes received feedback from users. In general, the feedback was positive in that they received the correct documents under some demands; that is, the information product achieved the expected objective which would be the receipt of correct information. Commission member 1 said that the manuals are made by the commission member "[...] usually he receives many thanks, the staff asks for the manual to send again, so I believe the acceptance is very good". In other words, there are apparently requests to send the documents produced, suggesting that there is a good receptivity in the interviewee's opinion.

4.5 Distribution of information

It was asked "How is information transmitted in electronic trading and is it sufficient to carry out activities?". Some respondents answered that the dissemination of information is passed on in remote meetings (Google Meet), as a form of training, and in Whatsapp groups some information is passed on as deadlines for carrying out the steps.

Chart 5. Means of transmitting procedural information

Information transmission
Remote meetings (google meet), as a form of training
WhatsApp groups are passed on some information

Source: Prepared by the authors, 2022

There is a prevalence of information transmission by informal and oral communications using digital platforms such as remote meetings (Google Meet) and Whatsapp groups, characterizing the transmission of tacit knowledge, that is, sharing knowledge from one person directly to another person (socialization). However, according to Nonaka and Takeuchi (2008, p.61) the sharing of tacit knowledge only (from person to person) is a limited form of knowledge. The transformation from tacit to explicit knowledge (externalization) is necessary for knowledge to be leveraged by the organization as a whole.

Disseminating information informally can bring some negative points, as that server who did not participate in the meeting may not have this access to information later, unless he has colleagues who participated and thus transmit what was informed, in addition, the colleague who participated may not inform him correctly. Another point would be the lack of official information from the institution that can cause a lack of standardization in the procedures or activities to be carried out by users.

4.6 Information use

Respondents were asked: "Does the information you produce generate the Institution's decision-making, the generation of new information or the action of another server? Could you cite an example?" The question was designed to verify whether the interviewee understands

that the information generated by him causes a decision making of the institution or an action of another server, that is, that he produces information.

The interviewees understand that they are information generators and that these can be used for decision making or for a new action by another server. The information generated can also lead to knowledge, as was the case of replicating a material description based on previous processes "[...] that product generated in a process already causes the production of a description for the acquisition of another similar product (Requester 3), as well as the use of commission ordinances that was carried out at one time and ended up being replicated as a good practice at the University, as explained by the interviewee Commission 1. The practice is in line with Choo's (2006) idealization in which the use of information can generate knowledge.

4.7 Information management at the Federal University of Alagoas

The question that moved the study, has "How is characterized the management of information in the processes of electronic trading in a Federal Institution of Higher Education?", the research was developed at the Federal University of Alagoas. It was observed that information management at the University is still in formation, requiring some improvements.

Positive points were found that should be considered, such as the initial use of procedure manuals, regulations, models, checklists of documents prepared by agents who are part of the procurement process; it was noticed that some materials commissions produced manuals for price quotation and that these are disseminated to other sectors that have difficulty in performing the task. So this practice is considered assertive at the University.

There was a flow of information between servers in the moments of clarification on electronic procurement procedures, although it was observed that knowledge remains tacit. It was noticed that some sectors transmit information to the servers that will carry out the activities related to the electronic auction procedures. Some sectors already have an internal organization of information and make information products to be used internally in the departments. A perceived practice that already exists at the University and in some sectors. The relevance of these processes is presented in the indication that the integration of this information, that is, the management of information so that the correct information reaches the correct person, throughout the electronic procurement process, leads to an improvement in the performance of the procurement processes (Rodriguez-Rios; Roa-Sanchez, 2022).

The Covid 19 pandemic in the 2020 period may have encouraged the use of digital platforms such as Google Drive for remote access to information and documents within sectors and Whatsapp for exchanging information between servers and mode for disseminating information on electronic procurement procedures. It was observed among the servers a practice of disseminating information among them, although there was no incentive or policies that influenced this behavior.

Problems were verified within information management, but also needs for improvements in knowledge management, mainly in an attempt to convert the tacit knowledge that is found in the minds of civil servants into explicit knowledge in policies, procedure manuals, guidelines and among other instruments in a more standardized way. This result reinforces the findings of Belinski, Frederico and Freitas (2021) on the importance and need for tacit knowledge about procurement processes in federal universities in the country.

Choo's (2006) information management model was used as the basis for analyzing information management in electronic trading at UFAL among the existing models in the literature. The model was used because it is referenced in several studies, such as Dutra and Barbosa (2020) mainly when relating information and knowledge management.

In knowledge management, it was necessary to complement other studies in the text, mainly using the theory of the knowledge spiral of Nonaka and Takeuchi (2008) in relation to tacit and explicit knowledge and the processes of knowledge conversion (socialization,

externalization, combination and internalization), in addition to Dutra (2021). On information sharing and the need to exchange information between different areas, studies by Dutra (2021); Davenport (2002) were used.

In the field of knowledge management, there were some productions on the possibility of managing knowledge, for some authors it is possible to manage knowledge, are Llarena, Duarte and Navarro (2017); Nonaka and Takeuchi (2008); Choo (2006).

According to Llarena, Duarte and Navarro (2017, p.19) knowledge must be managed "[...] in our opinion one of the main challenges of this new society that was born at the end of the 20th century [...] is to understand how to manage knowledge". There is an understanding in the literature in Information Science and Knowledge Management that it is possible to manage knowledge, even if it is in people's minds, because it is possible to develop guidelines for its management.

With regard to knowledge management, it is clear from the analysis of UFAL's practices and processes, that as Dutra (2021, p.267) mentions, some benefits can be achieved such as "transforming the greatest possible amount of tacit knowledge into explicit [...] increasing the organization's standardization [...] minimizing distances from those who record execution standards to those who perform [...] improving the efficiency of internal processes and reducing rework [...]".

CONCLUSION

The study had as research objective: to analyze how the information management is characterized in electronic trading in a Federal Institution of Higher Education In the investigation, the description and analysis of the phases of information management was carried out, from the need for information to its use.

After the descriptions of the stages of information management, an analysis of information management was carried out with its positive and negative points found, as benefits identified, it is highlighted that the interviewees have a concern to record knowledge in supports, such as procedure manuals or guidelines, and that there is a practice of elaborating information products and services in the institution, although it is not a uniform practice in all procurement sectors, as reported by the servers. The interviewees also have a practice of sharing information among colleagues or through WhatsApp groups, which demonstrates a culture of information dissemination, although it is not a constant practice, since the institution does not encourage the exchange of information nor does it have information management policies.

It is observed as losses to information management at the University, as some sectors have more difficulties in disseminating information both to users (e.g. purchase requisitioners) and to other sectors; personal sources being more used to resolve doubts about purchasing procedures, with tacit knowledge but failures in converting tacit knowledge into explicit (manuals, guidelines in explicit formats); Difficulty in accessing information from other sectors; outdated and poorly detailed purchasing manuals, among other problems.

The study of information management in organizations is essential for the improvement of organizational processes. Some basic information for the instruction of electronic trading occurs in the first phases and that has consequences on the final phases of the process (phase of operation of the electronic auction), mainly the elaboration of material description and price quotation (including one of the difficulties described by the servers in the electronic auction) and that are used in almost all phases of the process.

The study highlighted the importance of information management in the electronic procurement process, to assist all participants in the process, but especially for the auctioneers at the federal university, as already pointed out by Belinski, Frederico and Freitas (2021).

As limitations of the study, the difficulty of the research during the period of the Covid 19 pandemic stands out, especially in the data collection phase by interviews, since they were carried out remotely by google meet. Another limitation may occur due to the number of interviewees and sectors that were not surveyed, depending on the number of people interviewed, other problems in the information management cycle could have been identified. During the study, there was a concern to conduct interviews with more than one server, totaling thirteen servers, thus avoiding collection with a single respondent, in order to achieve the validity and reliability of the study.

In future studies, information products and services could also be analyzed in their content and the points to be improved could be evaluated. It can be studied in relation to the covid 19 pandemic if it influenced the decrease in the use of institutional e-mail and the increase in the use of digital platforms, if there is this relationship at the University.

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