AUTOMATION OF THE ASSETS SECTOR OF THE AMAZON FOUNDATION FOR SUPPORTING STUDIES AND RESEARCH PARÁ: WAYS TO OPTIMIZE THE INVENTORY SURVEY

AUTOMAÇÃO DO SETOR DE PATRIMÔNIO DA FUNDAÇÃO AMAZÔNIA DE AMPARO A ESTUDOS E PESQUISAS DO PARÁ: VIAS PARA A OTIMIZAÇÃO DO LEVANTAMENTO DE INVENTÁRIOS

AUTOMATIZACIÓN DEL SECTOR DE GESTIÓN DE ACTIVOS DE LA FUNDACIÓN AMAZONAS PARA EL APOYO A ESTUDIOS E INVESTIGACIONES EN PARÁ: FORMAS DE OPTIMIZAR LOS LEVANTAMIENTOS DE INVENTARIO

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ABSTRACT

This study focuses on the asset management of permanent assets at the Amazon Foundation for Support of Studies and Research of Pará (FAPESPA). The objective is to present a discussion on the feasibility of adopting Radio Frequency Identification (RFID) technology to automate the asset management of FAPESPA's inventories within the Sispatweb system. It will address the verification of the components of the asset management sector for the operational management of the system; the identification of the operational structure of SISPAT WEB for the integration of the technology and optimization of the time required for conducting the internal institutional inventory. Qualitative research was the method used, of an exploratory nature, employing bibliographic and documentary research. The data collection period was 2014-2024. The results showed that technological strategies can prevent potential human errors; optimizing the inventory process leads to improved occupational safety for employees, preventing occupational diseases such as Repetitive Strain Injury (RSI) and Work-Related Musculoskeletal Disorders (WRMD), aiming to achieve the objectives of axis III of the A3P agenda ODS12.

Keywords: Public Heritage. Automation. Technological Innovation.

RESUMO

Este estudo tem como objeto a gestão patrimonial de bens permanentes da Fundação Amazônia de Amparo a Estudos e Pesquisas do Pará (FAPESPA). O objetivo é apresentar uma discursão sobre a viabilidade da adoção de Tecnologia de Identificação por Radiofrequência (RFID) para automação da gestão patrimonial dos inventários da FAPESPA no Sispatweb. Abordará a verificação dos componentes integrantes do setor de patrimônio para a gestão operacional do sistema; a identificação da estrutura operacional do SISPAT WEB para a integração da tecnologia e otimização do tempo para a realização do inventário interno institucional. A pesquisa qualitativa foi o método utilizado, de cunho exploratório com

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a utilização da pesquisa bibliográfica e documental. O espaço temporal do levantamento de dados foi o período de 2014-2024. Como resultados foi possível identificar que as estratégias tecnológicas poderão evitar possíveis erros humanos; a otimização do levantamento do inventário leva a uma melhor segurança ocupacional dos servidores para evitar doenças ocupacionais como Lesão por esforço repetitivo (LER) e Distúrbios Osteomusculares Relacionados ao Trabalho (DORT), visando atingir os objetivos do eixo III da agenda A3P e ODS12.

Palavras-chave: Patrimônio Público. Automação. Inovação Tecnológica.

RESUMEN

Este estudio se centra en la gestión de activos permanentes de la Fundación Amazónica de Apoyo a Estudios e Investigaciones de Pará (FAPESPA). El objetivo es presentar un análisis sobre la viabilidad de adoptar la tecnología de Identificación por Radiofrecuencia (RFID) para automatizar la gestión de los inventarios de FAPESPA dentro del sistema Sispatweb. Se abordará la verificación de los componentes del sector de gestión de activos para la gestión operativa del sistema; la identificación de la estructura operativa de SISPAT WEB para la integración de la tecnología y la optimización del tiempo necesario para la realización del inventario institucional interno. Se empleó una investigación cualitativa de carácter exploratorio, con investigación bibliográfica y documental. El período de recolección de datos fue de 2014 a 2024. Los resultados mostraron que las estrategias tecnológicas pueden prevenir posibles errores humanos; la optimización del proceso de inventario mejora la seguridad laboral de los empleados, previniendo enfermedades profesionales como las lesiones por esfuerzo repetitivo (LER) y los trastornos musculoesqueléticos relacionados con el trabajo (TMRT), con el objetivo de alcanzar los objetivos del eje III de la agenda A3P ODS12.

Palabras clave: Bienes Públicos. Automatización. Innovación Tecnológica.

1 INTRODUCTION

The study of the automation of the survey of the institutional internal patrimonial inventory, in particular that of FAPESPA, is initially justified by the Complementary Law No. 101, of May 4, 2000 – Fiscal Responsibility Law, which brought, among other provisions, the perception of the need for greater control over public assets.

The Civil Code, in its Articles 98 and 99, provides that the assets of the national domain belonging to legal entities of internal public law are public, and all other private individuals, regardless of the person to whom they belong.

The Popular Action Law – Law 4.717, of June 29, 1965, defines public property in its Article 1, paragraph 1, as "assets and rights of economic, artistic, aesthetic, historical or tourist value" (Brasil, 1965).

In view of this, the objective of the study focused on the identification of strategies for asset management of permanent assets of the Amazon Foundation for the Support of Studies and Research of Pará (FAPESPA) in order to make feasible the adoption of Radio Frequency Identification Technology (RFID) for automation of the asset management of inventories in Sispatweb, from the use of the so-called Radio Frequency Identification Technology (*Radio Frequency Identification*-RFID).

The purpose of using a technology is to meet FAPESPA's needs with regard to reducing the time to survey inventory, less use of human resources, reliable asset information and more efficient control of assets in the location units.

Based on the above, the study presents a discussion on the importance of automation as an effective tool as a strategy for optimizing institutional processes by being able to contribute to the rationalized progress of actions related to the survey of public assets.

2 CONCEPTUAL AND NORMATIVE CONTRIBUTIONS OF PUBLIC ASSETS

According to the list of conceptualization of patrimony, its definition can be considered, according to Dias (2006), as the managed object that serves to provide entities with the attainment of their purposes. For an asset to be considered as such, it must meet two requirements: the element must be a component of a set that has economic content and can be evaluated in currency; and that there is interdependence of the component elements of the patrimony and the link of the whole to an entity that aims to achieve certain ends.

Reassuring Torres and Silva (2003), it is mentioned that public assets are made up of assets of all nature and kinds that are of interest to the public administration and to the administered community.

Another relevant definition of public assets according to Kohama (2009, p.173) "comprises the set of assets, rights and obligations, valued in currency, of the entities that

make up the public administrations".

This concept is found in Martins *apud* Mukai (2000, p.17) when he states that public assets are a set of goods, money, values and rights belonging to public entities (Union, States, Federal District and Municipalities), through direct or indirect and foundational administration, whose conservation is of public interest and diffuse, with not only the administrators, but also the administered, linked to its protection and defense. Such elements, even under the possession of a private individual, will never lose the quality of public domain given their origin: the public thing.

An even broader conception is found in the Brazilian Standards Applied to the Public Sector (NBASP) when it highlights that public assets as a set of rights and assets, tangible or intangible, encumbered or not, acquired, formed, produced, received, maintained or used by public sector entities, which is the bearer or represents a flow of benefit, present or future, inherent to the provision of public services or economic exploitation by public sector entities and their obligations (Brasil, 2012, p.13).

Therefore, public assets are composed of assets, rights and values that are in the hands of the government, but they belong to all citizens of a nation (Union, State and Municipalities) and, for this reason, it must be managed in the best way, respecting the principles of public administration, such as legality, impersonality, morality, publicity and efficiency (Brasil, 1965).

2.1 LEGAL ASPECTS OF PUBLIC ASSETS IN THE LIGHT OF SDG 12

To situate the legal and normative aspects that regulate public assets, it is noteworthy that accounting applied to the public sector had three major historical moments: the enactment of Law No. 4,320/1964, which established the foundations of the budget and, at the time of "public accounting", the advent of Complementary Law No. 101/2000, known as the Fiscal Responsibility Law (LRF), which established the concept of transparency, balance of public accounts, preservation of assets and responsibility of fiscal management.

Table 01 presents the Brazilian Accounting Standards Applied to the Public Sector (NBCASP), among the most important is NBC T 16.2, which establishes the definition of public assets and the classification of elements under the accounting aspect, in addition to presenting the concept of accounting information systems and subsystems for public entities.

Table 1

Public heritage and classification of elements based on NBCASP

Standards	Classification
NBC T 16.1	Conceptualization, object and field of application
NBC T 16.2	Equity and Accounting Systems
NBC T 16.3	Planning and Its Instruments under an Accounting Approach
NBC T 16.4	Public Sector Transactions
NBC T 16.5	Accounting Record
NBC T 16.6	Financial Statements
NBC T 16.7	Consolidation of Financial Statements
NBC T 16.8	Internal Control
NBC T 16.9	Depreciation, Amortization and Depletion
NBC T 16.10	Valuation and Measurement of Assets and Liabilities in Public Sector Entities
NBC T 16.11	Public Sector Cost Information System

Source: Feijó (2013. p.57)

Also according to the definition of the Federal Accounting Council (2012), public assets are the set of rights and assets, tangible or intangible, encumbered or not, acquired, formed, produced, received, maintained or used by public sector entities, which carries or represents a flow of benefits, present or future, inherent to the provision of public services or economic exploitation by public sector entities and their obligations (Brasil, 2012, p.5).

The existing diversified legislation on asset management in public entities guides decisions regarding the management of public assets and supports the public agent in making more efficient decisions. These norms have as their source of origin the most diverse in the Brazilian legal system, however, their purpose according to the CFC is to meet the new social demands that their statements as an essential item of the services of public managers, which must be prepared in order to facilitate, from the perspective of their users and society, the adequate interpretation of the patrimonial phenomena of the public sector, the monitoring of the budget process, the analysis of economic results and the financial flow.

It is noteworthy that the available information facilitates the inspection of Internal Control and External Control, in order to achieve efficient asset management, which should occur beyond the existence of an equity sector, for this, it is necessary: the institution of routines, the inspection of the procedures adopted and the evaluation of the results obtained. The application of Sustainable Development Goal 12 is important, as the use of public goods must comply with the principles of sustainability and shared responsibility in order to meet the principle of Sustainable Development recommended by the Federal Constitution of 1988 in its Article 225.

Everyone has the right to an ecologically balanced environment, a good for the common use of the people and essential to a healthy quality of life, imposing on the public power and the community the duty to defend and preserve it for present and future generations.

Thus, the linear economic model, based on the triad of extract, produce and discard, which predominated until the middle of the twentieth century with the publication of the *Meadows Report,* produced by the Massachusetts Institute of Technology, at the request of the Club of Rome, occurred a paradigm shift since, contrary to the Newtonian-Decartian thought of objectifying nature, it was demonstrated that the natural elements that provide resources for industry and human life they are finite and difficult to regenerate.

3 EVOLUTION AND STRENGTHENING OF AUTOMATION IN THE FIELD OF INNOVATION

The globalized world and the constant organizational changes impose the process of transformation of operational techniques and strategies in various sectors to the detriment of coexistence with planned obsolescence, that is, everything is always changing all the time. In addition, the development of nations, instant communication and social networks and the interactions that arise from them, help to form a range of citizens who demand much more from the government to ensure a better meeting of their needs and with the desired efficiency and effectiveness.

In this sense, automation has been increasingly studied with a view to identifying a means to achieve the principle of efficiency, as recommended by the Federal Constitution of 1988 and Constitutional Amendment No. 19, of June 4, 1998, which inserted in the constitutional text the principle of efficiency as a duty to be pursued by the Public Administration, so that this is included in the list of other principles contained in article 37, caput, of the Magna Carta, among them legality, impersonality, morality and publicity. In this regard, Gonçalves (2019, p.74,) states that "innovations enable efficiency gains, better governance, greater user participation, and transparency in public actions and services".

It is worth mentioning that, according to the Organizational Innovation in Budget Management in Federal Education Institutions (TICE.PT) platform in the item on Diagnosis and Proposals for Improvements, among the information that makes up its strategic matrix are those that deal with public administration, where it is highlighted that the public administration may, based on ICT, provide more efficient and effective services, both to citizens and companies, and can contribute to a fairer state, and to a greater approximation and participation of citizens in the processes of Democracy.

3.1 BRIEF CONSIDERATIONS ON THE EVOLUTION OF AUTOMATION

Efforts in the area of automation imply, for many authors, rethinking organizations and processes, as well as a change in behavior so that public services reach those who really

need them. These well-implemented changes will allow citizens, companies and entities in general to relate to the State more easily, faster and at a lower cost.

The concept of automation was instituted in the United States only in 1946, in automotive factories and, currently, the term means any system that uses computing and replaces human labor in order to increase the speed and quality of production processes, employee safety, in addition to obtaining greater control, planning and flexibility of production (Goeking, 2010, p. 1).

For Hitomi (1994), automating means, generically, exempting man or other living beings from performing tasks and, although the concept over the years has undergone several changes, its application has extrapolated the industrial context, where it was carried out through physical and specialized machinery.

Referring to organizational efficiency, it is possible to identify on the TICE.PT platform that Information Technologies (ICTs) can contribute to organizations being able to exhibit intelligent behavior, improve their performance, demonstrate competitive capabilities and sustained well-being.

It was identified based on Cardoso and Tavares (2021) that, in addition to ensuring organizational efficiency, suggests a wide range of concerns with the functioning of organizations that, in addition to the performance dimensions normally considered, also includes aspects that can be described as being related to the cognitive capabilities of organizations such as perception, memory, attention, communication, reasoning, learning, imagination and innovation.

Also according to Cardoso and Tavares (2021), the whole new scenario that automation, necessarily incorporated into management processes, has been composing, causes fear, doubts, and fears in those who have to deal with the changes it has increased. These are feelings that, little by little, give way to the feeling of satisfaction in the provision of services and care, as highlighted by some authors, with their respective definitions, in Table 2.

Table 2

Automation concept and definitions

Authors	Concept and definitions
Wall (2011)	Automation, in the same way, is an area of knowledge that seeks to offer human beings a set of solutions to their problems, usually related to well-being and productivity. Applications are not just about replacing human labor imbued with exhausting, monotonous and dangerous tasks; They bring improvement in the quality of processes, optimization of spaces, reduction in production time and costs.
Ribeiro (2003)	The concept of automation as the operation of a machine or system automatically or by remote control, with minimal human interference.

Goeking (2010)	The concept of automation was instituted in the United States only in 1946, in automotive factories and, currently, the term means any system that uses computing and replaces human labor in order to increase the speed and quality of production processes, employee safety, in addition to obtaining greater control, planning and flexibility of production.
Morais; Castrucci (2001)	Automation in industry stems from needs such as: higher levels of forming quality and flexibility, lower labor costs, lower material losses and lower capital costs; greater control of relative process information, higher quality of information and better production planning and control.

Source: Prepared by the author based on Parede (2011), Ribeiro (2003), Goeking (2010) and Morais; Castrucci (2001)

From this survey, it is possible to infer that the authors, when dealing with automation, are consensual on several points, including the quality of processes, information control, employee safety, reduction in production time and costs.

In this sense, the automation process should involve the treatment of information from a productive medium in order to produce more while spending as few resources as possible, ensuring the efficiency of production through the adoption of some technology that will displace human labor to technological rationalization.

In the studies of Ribeiro (2003), the concept of automation is defined as the operation of a machine or system automatically or by remote control, with minimal human interference. Automation is not a new concept, it was a pillar at the time of the 3rd Industrial Revolution, as it introduced new forms of production in factories, even using human resources and producing more goods than the artisanal system.

According to Dombrowski and Wagner (2014), an Industrial Revolution is characterized by radical technological changes and innovations in industrial systems, which transform the work environment, society and living conditions, and which has economic growth as its main consequence.

Therefore, in particular, organizational efficiency has been enhanced by ICTs, through increasingly distributed, arbitrarily remote and computationally ubiquitous information systems.

3.2 THE IMPORTANCE OF THE AUTOMATION PROCESS AND ITS APPLICATIONS

Considering that automation is a process that gained notoriety from the Industrial Revolution in the context of the move of the population from the countryside to the city, causing an increase in the demand for products, leading to the development of companies, from then on producers had to adopt large-scale and organized manufacturing systems.

The areas in which automation can be used have a wide range of applications, ranging from hospital environments to commercial establishments. Automation has several

advantages, but the main objective is to reduce costs and increase production speed (Magalhães; Ferreira, 2022).

According to Roggia and Fuentes (2016), the evolution of industrial automation goes back to long periods in history. Since prehistory, man has been developing mechanisms and inventions in order to reduce physical effort and assist in the performance of activities. As an example, we can mention the wheel for moving loads and the mills moved by the force of water or animal force.

The main reasons for the introduction of automation include greater production and greater productivity, avoiding waste when used in product manufacturing industries, as an example of an automated system is the palletizing of dishes in the ceramic industry, as shown in Figure 1.

Figure 1

Palletizing ceramic plates

Source: Mendes (2023).

It is noteworthy that the insertion of robotics in the palletizing of ceramic plates resulted in the protection of the worker's health, as it contained the risk of accidents and moved the workforce to safer places, in addition to the reduction of the number of hours on average per week by the workers.

The responsibility for assets in a public institution is shared among the following sectors: the equity sector, responsible for the analytical record; the accounting sector, responsible for the synthetic registration and the warehouse sector, responsible for the safekeeping of assets. They must develop mechanisms that ensure the integration between their procedures so that they maintain constant and regular communication, either by computerized means via integration between systems, or through control and conference through reports and forms.

Although initially their costs may be high, the benefits outweigh the expenses by providing better accuracy of results, the rational use of human resources and avoiding the waste of material in production chains.

Therefore, it is considered a tool that may be very useful for FAPESPA, since its use and efficiency is widely used in the private sector and has already been used in some public agencies with efficiency. In addition to finding several companies in the market that develop the technology, which makes its application attractive to the public sector in the event of a public bid.

4 METHODOLOGY

The research had a qualitative approach because the study requires an analysis following the thought of Günther *apud* Dilthey et al. (2000) who point to the primacy of understanding as a principle of knowledge, for studying complex relationships instead of explaining them through the isolation of variables.

Thus, the discovery and construction of theories were central to anchor the analysis of the object of study, carried out through perceptions that contributed to the construction of reality through the methodological procedure used for the investigation, which was bibliographic research and documentary research.

The purpose of a bibliographic research is to allow the researcher to know and analyze the theme of the research through relevant works already published and its purpose is to better understand the phenomenon under study for Sousa *et al*. *apud* Fonseca (2002), is carried out from the survey of theoretical references already analyzed, and published by written and electronic means, such as books, scientific articles, web site pages.

Sousa *et al*. *apud* Fonseca (2002) reinforce that any scientific work begins with a bibliographic research, which allows the researcher to know what has already been studied on the subject. There are, however, scientific researches that are based solely on bibliographic research, looking for published theoretical references with the objective of collecting information or previous knowledge about the problem to which the answer is sought.

The documentary study used for the study was due to its importance in scientific research. As highlighted by Silva, Jackson *apud* Caulley, Lüdke and André (1986), documentary analysis seeks to identify factual information in documents based on questions and hypotheses of interest.

By means of this technique, the objective is, according to Silva, Jackson *apud* Caulley apud Lüdke and André (1986), a person who wishes to undertake documentary research

must, in order to constitute a satisfactory corpus, exhaust all the clues capable of providing him with interesting information.

And it also consists of, according to Silva, Jackson *apud* Caulley apud Lüdke and André (1986), addressing the documentary technique of original documents, which have not yet received analytical treatment by any author. It is one of the decisive techniques for research in the social sciences and humanities.

Regarding the documents researched, the following publications were consulted, as shown in Table 3.

Table 3

Documents consulted during the documentary research

Types of documents	Subject	Year
National Treasury Booklet	New Accounting and Fiscal Management Modernization of Public Management.	2018
Ordinance No. 437	Approves Parts II. Equity Accounting Procedures, III. Specific Accounting Procedures, IV. Table of Accounts Applied to the Public Sector, V. Financial Statements Applied to the Public Sector, VI. Questions and Answers and VII. Practical Exercise, of the 5th edition of the Manual of Accounting Applied to the Public Sector (MCASP).	2012
Manual of Accounting applied to the Public Sector	Public Accounting	2019
Power Point Presentation	Presentation SIAFEM (Integrated System of Financial Administration for States and Municipalities)	2018
Manual of Procedures real estate heritage of the State of Pará.	Real Estate Management in the State of Pará.	2007
Manual of Procedures of the movable heritage of Pará.	Securities management in the State of Pará.	2008
Decree No. 345	Establishment of a Government Integration Working Group.	2018
Power Point Presentation	Presentation SIAFEM (Integrated System of Financial Administration for States and Municipalities)	2018
Power Point Presentation	The State Real Estate Management tool.	2018
Law 4.320	General Norms of Financial Law for the preparation and control of budgets and balance sheets of the Union, States, Municipalities and the Federal District.	1964
FAPESPA's Internal Regulations	Institutional Internal Regulations	2015
Presentation at the Latin Ibero-American Congress of Technology Management XV.	Comparative Analysis of the Technologies Used in Asset Control in Public Administration	2013

Source: Prepared by the author (2025).

The data collection referred to the period between 2014 and 2017, with the Material, Warehouse and Patrimony Coordination (COMAP) sector as its locus, one of the Coordinators that make up the Administration and Finance Directorate (DIRAD) of FAPESPA. It is the most recent coordination in terms of administrative performance of the institution, in 2014 it was disconnected from the Logistics Coordination (COLOG) and began to have its own administrative autonomy with the creation of a position of coordinator for this function, as well as an effective servant to contribute to institutional functions.

5 RESULTS AND DISCUSSIONS

5.1 THE SPECIFICITY OF ASSET MANAGEMENT IN THE STATE OF PARÁ

The Government of Pará, in order to meet the new requirements pertinent to the process of convergence to international accounting standards, in 2012, began the process of accounting transition to the new accounting standards which, according to the determination of the National Treasury Secretary to the States, with regard to the use of the following accounting facts: The update of the Manual of Accounting Applied to the Public Sector (MCASP), the Table of Accounts Applied to the Public Sector (PCASP) and the Financial Statements Applied to the Public Sector (DCASP) until the year 2012 in the States of Brazil was optional and becomes mandatory as of 2013.

Through the approval of Decree No. 345/2012, a specific working group was formed at the national level for the adequacy and modernization of the cultural and informatics organizational structure existing in the state public administration, which was under the coordination of the Special Secretariat for Government Management (GTGOV/PA).

It is noteworthy that the State of Pará is part of a select group of Brazilian states that have adapted to the new Table of accounts for the public sector in Brazil, along with the States of Rio de Janeiro, São Paulo, Alagoas, Pará, Maranhão, Piauí, Rondônia, Tocantins, as presented in the Implementation of the New Accounting Standards Applied to the Public Sector in the State of Pará (SIAFEM/PCASP).

From 2012 to January 2013, SIAFEM in Pará underwent changes in its operational and managerial part to cover the changes in the Accounting of the Brazilian public sector, with the objective of gradually adapting. The main changes at the management level were as follows: (1) Parameterization of the Balance Sheets; (2) Consolidation of Balance Sheets; (3) New Synthetic Balance Sheets; (4) Process to bring balances from the Previous Year; (5) Printed balance sheets; (6). New Annexes and Statement of Financial Surplus/Deficit; (7) Adequacy of the other Trial Balances, Statements and Annexes of Law 4,320/64.

Currently, all routines inherent to FAPESPA's patrimonial sector are computerized and

registered through the Material and Service System and Sispat-web or Sispat imóveis. With the changes in the accounting legislation, the Government of Pará has implemented measures to adapt to the new standards, which have been gradually implemented in the agencies of the State of Pará.

It is worth mentioning that, according to Ordinance No. STN 634/2013, the accounting procedures implemented in 2013 were the Specific Accounting Procedures (PCE), which included credit operations such as Fundeb, RPPS (Own Social Security Regime), active debt, public-private partnerships, consortium and court orders.

In 2014, the Equity Accounting Procedures (PCP) including revenue by accrual, obligations/provisions/13th, asset registration, registration of economic phenomena, infrastructure assets and other equity aspects, in the same year the new Table of Accounts (PCASP) was approved.

Although the State of Pará has made the accounting changes slowly and gradually according to the New Schedule of STN Ordinance 753/2012, also delivered to the TCE and has adapted to the new STN Ordinance 634/2013, of November 19, 2013, it has managed to implement them in accordance with the required national legislation and in convergence with international accounting standards.

Thus, it now has an Integrated System of Financial Administration for the State and Municipalities (SIAFEM) adapted to the new Table of Accounts in force, with Rio de Janeiro, São Paulo, Alagoas, Pará, Maranhão, Piauí, Rondônia, Tocantis standing out in the list of states that have adapted to changes in the system.

5.2 FEASIBILITY OF ADOPTING AN RFID TO AUTOMATE THE ASSET MANAGEMENT OF FAPESPA'S INVENTORIES

To situate the issue related to the adoption of RFID technology, it is necessary to highlight its feasibility, because when used in asset management it increases operational efficiency, eliminating the manual work of asset counts and reduces the chance of human error, such as: not seeing the number of listings, wrong heritage listing notes, loss of the inventory report carried out in the year

In this way, the efforts of FAPESPA's heritage team can be directed to other strategic actions such as: annual purchase planning, maintenance and service of SIMAS, processes of donation of permanent assets and maintenance of assets in Sispatweb. In addition to being a more accurate data system, this also allows you to have updated information on the assets as well as their state of conservation, ensuring more accurate decision-making by having reliable data, in addition to increasing security and helping to prevent theft.

The biggest risks in relation to the use are the initial need for high initial investment in hardware and software, in addition to integration with existing systems and training the team to use it correctly. The implementation of an RFID system has a cost to be analyzed by accounting based on three different sets of equipment: hardware, software and tags.

According to RFID manufacturers, the overall cost of a system varies according to the number of tags that will be needed, their material and their type (longer range, shorter range, information storage, among other factors). On average, an RFID tag in the United States can cost 25 cents on the dollar, and can rise in Brazil to 80 cents or 1.5 dollars per unit. Although its cost-benefit is higher when compared to the barcodes currently used at FAPESPA, its benefits still make asset management more efficient and optimized.

The feasibility study of the adoption of RFID technology took into account the items presented in Table 4. The analysis of the following aspects demonstrates the feasibility of using a radio frequency identification technology, which is fundamental for the asset management of institutional inventories.

Table 3

RFID Technology Adoption Feasibility Analysis Items

Nature of Assets	RFID is especially suitable for the identification of large goods, such as electronic equipment, furniture. The technology allows for quick and accurate reading of multiple items simultaneously, streamlining the inventory process.
Operating Environment	FAPESPA's infrastructure should be evaluated to verify compatibility with RFID technology. It is important to consider the presence of physical obstacles that may interfere with the reading of the tags, such as concrete or metal walls, and the need to install antennas and readers
Integration with existing systems	The RFID solution must be able to integrate with the asset management systems already used by FAPESPA, such as the accounting system and the access control system. This integration will allow for the automation of processes and the generation of more accurate reports.
Costs	The implementation of an RFID system involves costs with the acquisition of tags, readers, antennas and software, in addition to the costs of installation and configuration. It is important to conduct a detailed study of the costs to verify the financial feasibility of the project

Source: Elaboration by the author (2024).

Although occupational safety standards emerged to meet the needs of CELISTA workers (CLT), it is necessary to remember that the 1988 Constitution states that workers' health is a fundamental human right, based on the advent of the dignity of the human person, therefore, it is a legally constituted social right (Silva, 2007).

Based on this principle, it is possible to validate the application of the Regulatory Standards compatible with the particularities of each activity in this sector to maintain the physical and mental integrity of public servants, providing an adequate environment for the

performance of their activities, as well as validating the requirement of the Public Ministry of Labor regarding compliance with these standards (Villela, 2014).

Public servants in the heritage sector have the possibility of applying the terms of Ordinance No. 25, on December 29, 1994, which approved the text of Regulatory Standard No. 9 – Environmental Risks, being called Environmental Risk Prevention Program, more specifically to Ergonomic risks such as working conditions that expose the worker to physical and mental stress.

This process causes serious disorders, affecting their psychophysiological well-being, leading the individual to develop occupational diseases, which can be Work-Related Musculoskeletal Diseases (WMSD) through Repetitive Strain Injuries (RSI) and psychological diseases arising from occupational stress due to the overload provided by the work environment) and accidental as risks that can lead to the impairment of the physical integrity of employees, due to an inadequate environment to carry out their duties.

RFID technology, when used in asset management, increases operational efficiency, eliminating the manual work of asset counts and reduces the chance of human error, allowing the efforts of the asset team to be directed to other strategic actions such as: annual purchase planning, maintenance and service of SIMAS, donation processes of permanent assets and maintenance of assets in Sispatweb.

In addition to being a more accurate data system, this also allows you to have updated information on the assets as well as their state of conservation, ensuring more accurate decision-making by having reliable data, in addition to increasing security and helping to prevent theft.

The biggest risks in relation to the use are the initial need for high initial investment in hardware and software, in addition to integration with existing systems and training the team to use it correctly. The implementation of an RFID system has a cost to be analyzed by accounting based on three different sets of equipment: hardware, software and tags.

According to RFID manufacturers, the overall cost of a system varies according to the number of tags that will be needed, their material and their type (longer range, shorter range, information storage, among other factors).

On average, an RFID tag in the United States can cost 25 cents on the dollar, and can rise in Brazil to 80 cents or 1.5 dollars per unit. Therefore, although its cost-benefit is higher when compared to the bar codes currently used at FAPESPA, its benefits still make asset management more efficient and optimized.

6 CONCLUSION

Due to the study of the application of RFID technology for asset management in public entities, the impacts in the following areas are notorious: innovation in control and monitoring, optimization of resources, qualification and training, Sustainability and Social Responsibility and impact on research and scientific innovation. The objective of its application is for the State of Pará, through a pilot project to be carried out by FAPESPA, to have an entrepreneurial vision in the adoption of new technologies in the public service and to become a reference in innovative asset management systems, in addition to fostering research and scientific innovation.

As for innovation in control and monitoring, the collection of documentary data allowed us to identify that the implementation of innovative asset management systems will allow FAPESPA to improve the control and monitoring of its permanent assets. The introduction of technologies such as computerized asset management systems facilitates the tracking, maintenance, and depreciation of assets, ensuring greater efficiency and transparency in processes.

In addition, the RIFD will allow FAPESPA the opportunity for organizational improvement through the optimization of resources, this means the reduction of waste, the efficient control of the useful life of the assets and greater investment in preventive and predictive maintenance, which reduces the costs of asset management, helping to add value to the assets. The integration of new management methodologies, such as preventive and predictive maintenance, has contributed to the reduction of operating costs and the maximization of asset value.

Insertion of new technologies in public entities requires paradigm shifts and the challenge of changes that need to be aligned with a team with training and qualification for their implementation. And its main positive impact is the acquisition of new knowledge in Wealth Management that is consistent with the best practices applied in this area in order to ensure a more effective application of heritage policies.

FAPESPA, as a foundation that supports studies and the application of science in the State of Pará, in addition to being inserted in the application of sustainability within its administrative activities through the adhesion of A3P and by adopting practices that consist of policies aimed at the reuse and proper disposal of goods, will contribute to the social and environmental responsibility that one of the foundations of the circular economy.

Therefore, the improvement in the management of permanent assets will allow FAPESPA to offer better infrastructure conditions for its employees, since it will be able to have a better control of the entire useful life of the asset, helping the managers of the agency

to make more accurate decisions in the process of acquisition of new assets, in addition to the insertion of RFID allowing an innovation in the processes of inventory survey of assets, adding value to this activity and motivating employees through the achievement of the organization's objectives.

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