The organizational change brought about by the exchange of the information system in a company in the metalworking sector

Mudança organizacional provocada pela troca de informações do sistema numa empresa do setor metalúrgico

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Abstract
The objective is to analyze the change in the management system of a small company in the metalworking sector of Serra Gaúcha. The research is qualitative, exploratory, and applied in nature. Seven interviews were conducted with a twelve-fold questionnaire, the research instrument was adapted and validated. The interviews were transcribed and codified, and content analysis was performed. The results and conclusion showed that implementing a new management information system brought significant improvements to the company, such as greater efficiency, quality of information, reduction of operating costs, and agility in processes. However, the new system's rollout also came with challenges, such as significant upfront investment and employee resistance. The company must continue to monitor and evaluate the performance of the system, seeking solutions to the identified problems and ensuring user satisfaction.

Keywords: Management Information System. Organizational Change. Investment.

Introduction
Now it is difficult to think of a minimally structured company that does not have the use of some information system that helps it in the management of the organization. Some
time ago, companies only used systems to automate some tasks within the organization, but nowadays, it is necessary to align with the strategic objectives of the organization, as well as the search for a competitive advantage and not only aim for operational efficiency or its use as support for decision-making.

The advancement of systems has the challenge of controlling business processes with a single software architecture (TURBAN, 2004). Our government contributes to the computerization of companies by creating computerized inspection mechanisms. New impositions of ancillary obligations to companies are being created, such as the electronic invoice, which forces organizations to structure themselves. In addition, it also involves the need to generate information in areas such as human resources, inventories, and the calculation of taxes itself.

In the work of Brodbecke Hoppen (2003), it is possible to analyze a perfect process of implementation of a new system for a large organization. This article will address the change and consequent change of system in a small organization belonging to the auto parts segment, located in the countryside of Rio Grande do Sul. The analysis of positives and negatives in the system switching process is very important to gain an understanding of all the complexity involved within this process.

The research problem defined for this work is: how does the change of a management system occur in a small company in the auto parts sector of Serra Gaúcha?

To this one The objective of this article is to analyze the change in the management system in a small company in the metalworking sector of Serra Gaúcha. Currently, it is difficult to think of a minimally structured company that does not make use of some information system that helps it in the management of the organization. Not long ago, organizations used systems only to automate some tasks within the company, however, now it is necessary to align with the organization's strategic objectives, as well as the search for a competitive advantage and not just the search for operational efficiency or its use as support for decision making.
Theoretical Background

2.1 The Importance of Management Information Systems for the Competitiveness of Companies

The expansion and expansion of technology are fundamental for the consolidation of technological innovation. According to Rogers' (2003) Diffusion Theory of Innovation, the process of adopting and spreading innovation involves the communication of innovation between members of society over time. This process can be observed from four perspectives: relative advantage, complexity, testability, and observational capacity. In short, if the adoption and diffusion process is not efficient, innovation will have a hard time establishing itself.

A company's ability to survive and have competitive advantages in world markets depends on factors such as the efficiency of public institutions, the excellence of educational systems, health, and communication infrastructure, as well as the political and economic stability of the country of origin (ÖNSEL et al., 2008). The resources available in the company and its size are also internal competencies that can impact competitiveness (ELSAYED, 2006; LÓPEZ and MOLINA, 2015).

Therefore, a business strategy applied by a company can be decisive in improving its competitive position in the market (FEURER; CHAHARBAGHI, 1994). These strategies are innovative when organizations feel pressured by competitors or perceive opportunities to outperform them, especially in an increasingly globalized world (PORTER, 2004).

Globalization has brought profound productive and socioeconomic transformations, intensifying international competition. This requires a new approach to understanding and boosting competitiveness. In addition, an information system is important to assist in the decision-making process (SOLLEIRO and CASTAÑÓN, 2005).

Information systems play a key role in organizations, providing information to support management and decision-making (CASSARO, 2023). They are made up of interrelated components that collect, process, store, and distribute relevant information. Information technology is an integral part of information systems and is used to achieve organizational objectives (REZENDE and ABREU, 2008, SANTOS, 2023).

Investments in information technology are made based on the assumption that they have the potential to improve business effectiveness and provide competitive advantages. However, investment in IT does not necessarily guarantee a competitive advantage, and research on the subject is still inconclusive (LAUDON and LAUDON, 2007; REZENDE and...
ABREU, 2008). Information systems are responsible for organizing and processing data and generating information that helps in the management of the company. They should assist in the design of product and service management, offering competitive advantages over competitors (KROENKE, 2017).

The definition of "system" has varied over time and depending on the area in which it is applied. Some of these concepts are mentioned by Rezende and Abreu (2008): A set of parts that interact with each other, integrating themselves to achieve a goal or result; Interacting and interdependent parts with certain objectives and function; Set of software, hardware, and human resources that make up computer science; Information technology components and their integrated capabilities; Company and its subsystems (SANTOS, 2023).

One of the challenges for product development companies is to use information technology effectively and competitively. This means that organizations are increasingly investing in IT to improve their performance. However, the success of an information system should not only be measured by its efficiency but also by its effectiveness in supporting the company's strategies and increasing its business value (O'BRIEN, 2003; KHALAF, 2012).

Information systems can be classified as formal and informational. Formal systems have pre-defined elements for inputs and outputs, while informal systems can take various forms, such as emails, blogs, and social networks (STAIR and REYNOLDS, 2011; PIDUN and FELDEN, 2012). Management information systems play an important role in supporting managers' decision-making. They provided information about the organization's regular operations, enabling managers to control, organize, and plan effectively (BOSE, 2006; ELGUY, 2023). The success of an information system depends on organizational alignment, managerial support, change in management, interaction between users and developers, requests, and the quality of the system.

According to O'Brien (2003), the success of an IS should not be measured only by its efficiency (minimizing costs, time, and use of information resources), but also by its effectiveness in supporting the company's strategies, the training of its business processes, the reinforcement of its organizational structure and culture and the increase of the commercial value of the enterprise. It should be noted that performance does not always depend only on the company in question, but on the other companies in the market (TURBAN, 2010; ELGUY, 2023).

O'Brien (2003) classifies the IS in two strands: operations support systems and management support systems. Operations support systems are those that produce a variety of information for internal and external use by the organization. Its function is to process
transactions, control industrial processes, support communications, and update company databases. Management support systems, on the other hand, are those that provide information to support managers' decision-making (STAIRS and REYNOLDS, 2011; CASSARO, 2023).

It is also important to talk about the life cycle of an information system, which is understood by development, use, and possible death (REZENDE and ABREU, 2008). The last step occurs when it no longer meets the requirements for which it was developed. The life cycle presented by Turban et al. (2003) demonstrates eight stages in a well-defined way. The authors say that the phases a system goes through will depend on the size of the IS project. Usually, the larger ones need all the phases. Smaller ones, on the other hand, can go through fewer steps. In any case, the authors do not exemplify criteria that allow defining or classifying an IS project by its size.

2.2 The Complexity of Organizational Change and Its Relationship with Organizational Culture

Organizational change is a long-term political learning process, motivated by the need to determine the legitimacy of different patterns of relationship between content, context, and process. Change is seen as an intermingling, where the variations of mutations can be mutually defined in a series of items that interrelate in actions, interactions, and interactions. For a better understanding of the capacity for change, it is important to highlight that the organization must be able to produce solutions that are aligned with the evolution of the external environment and the internal evolution of the organization, to effectively implement these change processes within the organizational context (POZZO et al., 2022).

Schein (2009) defines organizational culture as a pattern of shared basic assumptions, which is understood by a group as it solves its problems of external adaptation and internal interaction. This pattern has worked well enough to be considered valid and is therefore passed on to new members as the correct way to perceive, think, and feel about these problems.

Every attempt to describe or understand organizational change presupposes an integrated understanding of organizations. A change can be seen as a temporal state between two beneficial moments of a specific organism. It can be considered a general characteristic of organizations, present in constant processes of reproduction, as a means of simple rhetoric to dissociate an organization from its dynamic environment, or as a social technology that hides capitalist logic in modern management. This diversity stems from the many
organizational theories and is not a problem in itself, but rather a sign of a rich debate, led by curiosity and the quest to understand the complexity of life (BORTOLOTTO et al., 2021).

Organizational change is a notoriously complex concern and, naturally, a study of it expresses the complexity of several visions, some complementary and others contradictory, but all realistic. One way to demonstrate the state of fragmentation is to consider the different levels of aggregation: the micro, with a focus on individuals; meso, with a focus on groups and organizations; and the macro, focusing on the organizational environment and the populations of organizations (POZZO, 2022).

According to Lima (2003), organizational change refers to any change, planned or unplanned, in organizational components, such as people, work, formal structure, culture, or relationships between the organization and its environment, which have relevant consequences, positive or negative, for organizational efficiency, effectiveness, and sustainability.

For Bressan (2001), any significant change in organizational components, such as people, structure, products, processes, and culture, can be considered an organizational change. This modification can be personalized or unpersonalized, formal or informal, and affect most members of the organization. In addition, the goal of change is to improve organizational performance, in response to internal or external demands. According to Bruno-Faria (2003), any change that occurs in the organization, planned or not, resulting from internal or external factors, that impact the results or the relationships between people at work, can be considered an organizational change.

Planning an organizational change that involves different organizational levels and attitudes can help companies better overcome resistance to change and integrate their efforts toward sustainability (LOZANO, 2013). Fuentes-Henríquez and Del Sol (2012) state that the implementation of a change requires important modifications, both in the nature and configuration of organizational resources, such as economic, human, technological, information, and administrative resources. Therefore, a clear strategic plan is needed to manage potential role conflicts and minimize resistance to change within the organization (HENRIQUES et al., 2019).

A significant change is defined as any change that impacts the company due to a radical financial change and/or organizational adjustment. This change is seen as affecting the majority of employees or impacting the financial health of the operation. It can be referred to as strategic (CHRUSCIEL and FIELD, 2006; OLIVEIRA and PANTOJA, 2023).
A company's performance depends on how it adapts to the environment in which it operates, shaping itself according to the type of business, market, products, or management style. With this concept, Mandelli (2003) justifies the importance of change in the business context. Companies seeking organizational change aim to achieve the high performance required by the market. According to Azevedo (1997), this involves a redefinition of the company's boundaries and, consequently, reflects on processes, command lines, systems, infrastructure, and information technology, among others (HENRIQUES et al., 2019).

Managing innovation, and balancing the past, present, and future, is key to changing and preserving the constant form, keeping up with the obsolescence of the relevant past. These are the steps indicated by Motta (1998). According to him, change is progressive, but not all dimensions of the organization can and should be changed all the time. Some stability is still needed as a reference for the change itself (KÜHLER et al., 2023).

Argyris (1992) points out that human beings hate losing control of their actions. Situations that threaten their daily routines cause them to react in defense of their opinions and rules. According to Azambuja (2003), it is important to ensure that all employees understand the real reasons for the changes for the continued success of any project in this regard.

According to Motta (1997), among the advantages of organizational change, the ability to value certain factors to direct change in some of its perspectives stands out. Among the advantages, the difficulty of seeing opportunities stands out due to the tendency to focus change on a single perspective. For Bitencourt and Ruas (1996), facilitating factors can be considered as strategies that aim to treat situations that inhibit change and establish commitments in people about the accessibility of change. They identified four enabling agents: communication, training, reward, and benchmarking.

According to Strebel (1996), although there are particular circumstances in each company about organizational change, the difficulties have one thing in common: managers and employees see differently (KÜHLER et al., 2023). According to Schmidt and Pinheiro (2003), senior management sees organizational change as an opportunity to strengthen its business operations, aligning itself with the company's strategy and taking on new challenges and risks. About employees, Garvin and Roberto (2005) state that the discomfort generated by organizational change results from the reluctance to change their habits, because they believe that the method that worked in the past is good enough to continue to be used.

Kotter (2000) points out that the biggest obstacle in the development of change is the organizational culture, as it involves a change in the behavior of employees, who only see
organizational change as an opportunity for growth if they identify advantages for themselves and/or for the group (RODRIGUES; PEAR TREE; MARTINS, 2023). Therefore, it is highlighted that cultural changes are possible, but difficult to manipulate (BALDI, 1999).

2.3 Evaluation of Information Systems: Concepts and Processes

Evaluation is a means of judging the overall value of a system (O'KEEFE; BALCI; SMITH, 1987). Evaluation is not only related to the measurement of the acceptable performance of software, but also to its use, efficiency, and cost (BORENSTEIN and BECKER, 1999). It encompasses several processes, including validation, which is the process of determining whether the model's behavior represents the system in the real world in a given problem domain (Borenstein and Becker, 1999).

Custódio (1983) addresses the evaluation techniques of Information Systems (IS), such as cost-benefit, cost-effectiveness, and perception of value, relating the choice of methods to factors such as managerial function (operational, managerial, or strategic); type of decision (structured, semi-structured, unstructured) that the system tends to serve; characteristics or type of system to be evaluated; and time of evaluation. The author also states that the use of one method does not exclude the possibility of complementing the evaluation with another (CASSARO, 2023).

Ahituv (1990) realizes that it is preferable to evaluate the impact of the IS, identifying its benefits (emphasizing those that justify the implementation of the system due to the effects on the organization) and trying to associate them with the costs involved. Different sets of features indicate different benefits. However, if the goal is to require the adoption (or permanence, or replacement) of an IS, the benefits, depending on their tangibility, will provide argumentative power (CASSARO, 2023).

Freitas, Ballaz, and Moscarola (1994) highlight a global model for the evaluation of an IS, based on two main pillars: a) ease of use - related to the system and the interface-system interaction; b) humanity - related to the user, i.e., functions, activities, and processes in which the user is involved. These points are analyzed taking into account a typology of users. The main contributions are related to mapping, i.e., to the storage and analysis of all actions performed by the end user during the IS consultation, and to an instrument - motivated by the "theory of acts" of Moles (1990) - to verify the "generalized cost" of the implemented system, i.e., the value of the system perceived by the user (MAIA; BARBOSA; WILLIAMS, 2020).
User satisfaction is a sum of positive and negative responses to a set of factors, and it is possible to measure it against this definition. Bailey and Pearson (1983) identified, through interview techniques, thirty new factors that affected user satisfaction.

It's hard to imagine how information technology can be evaluated without measuring its impact on the individual's work.

Based on the recognition of the literature on the impact of technology on the nature of work, Doll et al., (1999) developed an instrument to measure this impact: (1) of a multidimensional nature of the impact of information technology at the level of the individual end-user; (2) easy to use and appropriate for research and academic practice and (3) can be used with confidence in a variety of applications and contexts; I subdivide it into four constructs: productivity, management control, innovation and customer satisfaction that aim to evaluate the impact of IT. Therefore, the literature presents a variety of methods to evaluate the success of an IS (MAIA; BARBOSA; WILLIAMS, 2020).

**Methodology**

Exploratory qualitative research of an applied nature is a scientific approach that seeks to understand and explore complex preferences and contexts through the analysis of qualitative data. In this type of research, the focus is on obtaining a detailed and in-depth understanding of the object of study, taking into account its complexity and nuances (FLICK, 2009).

Exploratory qualitative research of an applied nature is described by an iterative and flexible process, in which the researcher experiments with the study environment, collecting and analyzing data systematically and reflectively. This approach allows the researcher to explore research questions openly and flexibly, without the slightest likelihood of pre-defined situations (TAQUETTE, 2021).

The application of qualitative exploratory research can cover several areas of knowledge, such as social sciences, psychology, education, and health, among others. It can be used to investigate complex and multidimensional problems, such as understanding the perceptions and experiences of individuals in a given context, identifying emerging patterns and trends, or exploring new approaches and solutions to practical problems (Cardano, 2017).

Data collection in exploratory qualitative research can be carried out through techniques such as in-depth interviews, participant observation, and document analysis, among others (FLICK, 2009). The analysis of these data is done inductively, i.e., from the
data found, certain patterns, categories, and themes emerge from the analyzed material. This approach allows the researcher to understand the complexity and diversity of the interactions studied, as well as the relationships between different elements (TAQUETTE, 2021).

Exploratory qualitative research of an applied nature contributes to the advancement of scientific knowledge by offering a deeper and richer understanding of trained traits. In addition, this approach can provide insights and practical recommendations for troubleshooting and decision-making in different application areas (CARDANO, 2017).

The research instrument was adapted from Bailey and Pearson (1983), Doll et al., (1999), and Dallagnol (2019). The adaptation of a quantitative research instrument to a qualitative research instrument is a complex process that involves transforming the items and questions of a structured questionnaire into a set of open and flexible questions, capable of capturing the nuances and complexities of a specific study (OLLAIK and ZILLER, 2012).

When adapting a quantitative research instrument to a qualitative one, it is important to consider the fundamental differences between these approaches. While quantitative research seeks to measure and quantify specifications through closed-ended questions, qualitative research seeks to explore and understand specificities through open-ended and flexible questions (TAQUETTE, 2021).

The first step in adapting a quantitative instrument to a qualitative one is to perform a critical review of the original questionnaire. This involves identifying the questions that are suitable for the qualitative approach and those that need to be modified or additional. During the adaptation process, the pilots performed qualitative tests of the adapted instrument to verify its clarity, relevance, and ability to capture the desired information. Participating pilots can provide valuable feedback to enhance and refine the instrument before its final implementation (OLLAIK and ZILLER, 2012).

3.1 The Case

The single case study is a qualitative research strategy that focuses on a single individual, group, organization, or event. It is often used to explore a phenomenon or issue in an in-depth and comprehensive way (FLICK, 2009).

The single case study is characterized by:

1. **Focus on a single case:** The single case study focuses on a single case, which can be an individual, group, organization, or event.
2. **In-depth investigation**: The single case study involves an in-depth investigation of the selected case, utilizing a variety of data collection methods, such as interviews, participant observation, and document analysis.

3. **Subjective interpretation**: The single case study is based on the subjective interpretation of the investigator, who uses his or her knowledge and experience to understand the case study.

H3 Componentes was founded in 2015 by three brothers of the Hoffmann family, to manufacture flashlights for trailers and trucks. The company started its activities in the garage of his father's house, with only 30 m², and outsourced the other production processes. In 2017, the company purchased its first injection molding machine and moved to a 280 m² building. In the same year, two more injection molding machines and an ultrasonic welding machine were purchased.

In 2019, the company expanded its facilities to a 600 m² pavilion and acquired two more injection molding machines and an ultrasonic welding machine. Investments have also been made in automation processes in the resin-making and SMD assembly sectors. At the beginning of 2021, the company purchased an automatically packaged machine and currently has 22 employees. In April 2022, H3 Componentes expanded its industrial park to 2,000 m², distributed between headquarters and branches.

H3 Componentes is an example of a company that has grown rapidly in a competitive market. The company owes its success to several factors, including:

- **Planning and forward-thinking**: The company's founders had a clear vision of the market and the products they wanted to offer.
- **Investment in infrastructure and technology**: The company has continuously invested in infrastructure and technology to improve its production capacity.
- **Focus on quality**: The company has always been concerned about the quality of its products.

H3 Componentes is a promising company that has the potential to become a major player in the automotive components market.

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9 Surface Mounted Device
3.2 Data Collection and Respondent Profiling

Data collection through semi-structured interviews is a technique widely used in qualitative research. In this type of approach, the researcher has a pre-defined script of questions but also has the flexibility to explore emerging topics during an interview. This allows for greater depth and understanding of the data collected (CARDANO, 2017; FRANCO, 2020).

The process of collecting data through semi-structured interviews involves the following steps:

1. **Planning**: The researcher defines the objectives of the research, identifies suitable participants for the interviews, and develops a script of semi-structured questions.

2. **Selection of participants**: Based on the defined inclusion criteria, the researcher selects the participants who will be interviewed. This selection can be made by intentional sampling, researched with different perspectives and experiences relevant to the study.

3. **Conducting the interviews**: The researcher conducts the interviews, following the script of semi-structured questions. During the interviews, the researcher can explore emerging topics and ask additional questions to gain more information.

4. **Data recording**: Interviews are recorded, either through audio recording or notes taken. It is important to ensure the confidentiality and anonymity of participants if necessary.

5. **Data transcription and analysis**: Interviews are transcribed and proven to identify relevant patterns, themes, and insights. This can be done through qualitative analysis techniques, such as data consolidation and categorization.

When conducting semi-structured interviews, it is important to consider ethical issues such as obtaining informed consent from participants, ensuring the confidentiality and anonymity of the data collected, and treating participants with respect and sensitivity. Table 1 shows the profile of the respondents.
The organizational change brought about by the exchange of the information system in a company in the metalworking sector

<table>
<thead>
<tr>
<th>Code</th>
<th>Sector</th>
<th>Interviewee</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>Director/Founder</td>
<td>William Hoffmann</td>
<td>37</td>
</tr>
<tr>
<td>R2, R3</td>
<td>Production Scheduling &amp; Control</td>
<td>Employees</td>
<td>30, 35</td>
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<tr>
<td>R4</td>
<td>Billing</td>
<td>Employee</td>
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<td>R5</td>
<td>Shopping</td>
<td>Employee</td>
<td>32</td>
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<td>R6</td>
<td>Commercial</td>
<td>Employee</td>
<td>28</td>
</tr>
<tr>
<td>R7</td>
<td>Human resources</td>
<td>Employee</td>
<td>22</td>
</tr>
</tbody>
</table>

Table 1 – Respondents’ profile
Source: prepared by the authors (2023)

After the interviews, content analysis was performed. Bardin's (2016) content analysis is a technique used to analyze qualitative data, such as texts, images, and videos, among others (FRANCO, 2020).

Presentation and Analysis of Results

4.1 Description of the Old System and Its Limitations

Management Information Systems (GIS) are tools used by organizations to collect, process, store, and analyze information relevant to management decision-making. However, just like any other technology, GIS can also become obsolete over time (REZENDE and ABREU, 2008). Here are some reasons why management information systems can become obsolete:

1. **Outdated technology**: GIS can become obsolete due to the rapid advancement of technology. For example, if a GIS was developed using outdated technology, it may not be able to handle current demands or take advantage of the benefits of newer technologies.

2. **Lack of integration**: As organizations grow and expand, it is common for them to adopt different information systems to meet their specific needs. If these systems are not integrated efficiently, there can be gaps in information collection and sharing, making GIS obsolete.

3. **Changing user needs**: The needs of a GIS's users can change over time. If a GIS is not able to meet these new needs or efficiently provide relevant information, it can become obsolete.

4. **Lack of support and updates**: If a GIS does not receive adequate support from the vendor or is not regularly updated to keep up with technological changes and user needs, it can become obsolete.
5. **High costs:** Management information systems can sometimes become obsolete due to the high costs associated with maintaining, upgrading, and supporting them. If costs become prohibitive, organizations may choose to replace GIS with a more cost-effective solution.

The company used the old system, while in the Simples Nacional modality, until this year having in it good quality support while meeting the percentage required for such modality, but with new changes in the company this system was changed to the General Modality which replaced the old system which no longer met its expectations (R4).

The activities developed that required more time were the part of tax classification, tax incidence, and ERP\(^{10}\) (production). It is a deficient system in terms of routings, very simple and limited in terms of product structures and production order notes, also due to the lack of fields to be filled in for the preparation of production routing. These tasks were performed by the accounting clerk (R4).

### 4.2 Description of the New System and Its Improvements

New management information systems (GIS) are increasingly present in all types of enterprises, regardless of their size. With the advancement of information technologies, innovative solutions emerge that seek to improve efficiency and decision-making in organizations (REZENDE and ABREU, 2008, SANTOS, 2023).

These new management information systems utilize modern technologies such as artificial intelligence, real-time data analytics, cloud computing, and process automation. They can analyze, analyze, and analyze large volumes of data quickly and accurately, providing relevant information for managers to make strategic decisions (STAIRS and REYNOLDS, 2011; CASSARO, 2023).

In this new system, tasks or transactions are not very easy and fast at the time of its implementation, because they initially require more time and work, but they tend to become faster and easier to handle after its configuration. This new system has shown more user satisfaction, greater accuracy of information, agility of processes, and ease of use (R1).

Its time of use is available during working hours, as it depends on access to the server, which has a time limit: Monday to Friday, from seven o'clock in the morning to twenty o'clock at night, and Saturdays, from seven o'clock in the morning to noon. From what it initially

\(^{10}\) Enterprise Resource Planning
demonstrates, this new system presents quality, safe, and reliable information, but there is the issue that it has an expiration date, just like the previous system, this will depend on how much the company develops and presents its growth (R5).

4.3 Financial Impacts and Gains of the New System

The implementation of new management information systems can have several financial investments for an organization. These impacts can be positive or negative, depending on how the system is implemented and utilized (CHRUSCIEL and FIELD, 2006; OLIVEIRA and PANTOJA, 2023). Some of the main financial impacts are:

Reduced operational costs: An efficient management information system can automate tasks and processes, reducing the need for labor and hurting operating costs. This can result in savings in financial resources for the organization.

Improved efficiency: With a proper management information system, it is possible to obtain more accurate and real-time information about the company's operations. This allows for better decision-making and greater efficiency in processes, which can lead to an increase in productivity and, consequently, a reduction in costs. Improved quality of information: A well-implemented management information system can provide more accurate and confidential information about the organization's finances. This can help in identifying problem areas, detecting fraud, and improving financial control, which can result in better management of financial resources (TURBAN, 2010).

Improved internal communication: An efficient management information system can facilitate communication between the different departments and hierarchical levels of the organization. This can streamline the flow of financial information and facilitate collaboration between teams, which can result in better financial management (O'BRIEN, 2003). Initial Investment: Implementing a new management information system typically requires a significant upfront investment. This includes costs for purchasing software, hardware, staff training, and consulting. These start-up costs should be considered when evaluating the financial results of the system.

Maintenance and upgrade costs: In addition to the initial investment, management information systems also require ongoing maintenance and upgrade costs. This includes costs for technical support, software, and hardware upgrades, additional training, and use licenses. These costs should be considered when assessing the long-term financial impacts of the system (KHALLAF, 2012).
As for the financial gains, the investment in changing the system is worth it for the positive consequences in terms of the expected return, even in the long term. When it comes to production, there is a decrease in the number of setups, with productivity gains by having larger batches and what they need to develop. There is also greater precision in the batches to be produced with more complete routing and order marking, having the correct production time for each part, making it possible to better evaluate the daily/monthly cost by sector, generating a more assertive cost/price, different from the old system that was by estimation (R7).

Regarding shipping, there is greater precision in the separation of orders, as they have barcode readers because, in addition to the correct counting of the pieces, there is a historical record of what is actually in the box, reducing the incidence of errors and avoiding inconvenience with customers, notes, freight or even losses (R3).

When it comes to costs today, with the old system there is no possibility of doing them, because it does not have the specific module and they are done in Excel spreadsheets, all based on production estimates. With the new system, this will be possible, based on all the information already described, by generating reports, more agility with accounting processes, issuance of invoices, and even greater agility in the process of including orders in the system (R4).

In the company's production scheduling and control area, in an interview with the two employees of this sector, it was reported that the old system was used to generate production orders, order notes, report issuance, purchase orders, balance and inventory queries, item registration, and structure registration. The activities that required the most time were the generation, printing, and marking of production orders (R2 and R3).

At the time of generation, it was necessary to place orders for all levels of items, manually, entering the code, quantity, and date of the order. In printing, the images had a large size (resolution and bytes) and required a high volume of data from the database, which consumed a high time, around 15 minutes to print 20 pages of order. In the note, sometimes the system crashed, and it was also a process in which you had to enter a lot of information. In total, three people knew how to perform these tasks (R2).

According to the interviewees from the PCP area\textsuperscript{11}, in this new system, the tasks are faster compared to the old one. Inventory control is greater and MRP\textsuperscript{12} helps generate demand for production. Queries to reports are faster, and the ways to export this information are better.

\textsuperscript{11} Production Planning & Control
\textsuperscript{12} Manufacturing Resource Planning
The structures are reliable, which grants greater security about what to produce and buy, based on what is pointed out and reported to the system. Pointing orders has become faster, as it has made it possible to point out several orders at once. In addition, the generation of orders is now automatic by the calculation of MRP (R2 and R3).

### 4.4 Satisfactions and Dissatisfactions with the Implementation of the New System

The implementation of a new management information system can bring both satisfaction and dissatisfaction to an organization (TURBAN, 2010; HENRIQUES et al., 2019).

**Satisfaction:**

1. Automating tasks and processes, which can result in increased efficiency and productivity.
2. Improvement in the quality of available information, allowing for more accurate and informed decision-making.
3. Facilitation of internal communication, streamlining the flow of information between departments and hierarchical levels.
4. Ability to identify problem areas and implement improvements, resulting in more efficient financial management.
5. Reduction of operating costs, such as the decrease in the need for manpower.

**Dissatisfaction:**

1. Significant upfront investment, which can be a financial challenge for the organization.
2. Ongoing system maintenance and upgrade costs.
3. Resistance and difficulty of adaptation of employees to the new system.
4. Potential technical issues and failures in improvements that may affect the organization's operation.
5. Time required for training and qualification of employees in the use of the new system.

Regarding the degree of user satisfaction, it was pointed out that there are still some pending issues to finalize regarding the implementation, especially in the company's shipping part. However, the new system presents a very satisfactory return because it provides more complete information for the organization and management, facilitating the processes (R1).
It has been found that, at times, failures occur, but this is not a system problem, but the erroneous information that is entered into it. But other than that, the system provides reliable information. Regarding the internal pressure to expose the results of the new system, it was found that it exists, but it is very much related to the pending issues that remained at the time of implementation.

As for financial gains that the new system brings to the company, in the view of the employees, the assertiveness in what to produce and buy, inventory control, and agility in the processes were mentioned, in addition to the reduction of the margin of errors. Focusing on the production sector, the system has brought improvements because it provides information and performs analyses that facilitate decision-making. Regarding financial resources for investment in the implementation, improvements, and maintenance of the system, the company allocates adequate resources within its possibilities.

In an interview with the employee in the billing sector, it was found that due to their time in the company, she only had contact with the new system. Asked about the existence of internal pressure, the answer was that there is a concern about the fact that it is a high investment value and there should always be an evaluation of it.

She believes that the more efficient and agile the system is, the more financial gains it will have since it will have more optimization of time and labor. In addition, working with an adequate system ends up making the employee more satisfied. It was also mentioned that there is support being provided and employees give suggestions for improvement to the system.

In the purchasing area, the employee reported that she used the old system for part of the invoicing, XML import, and purchase orders, but all processes took a long time due to its slowness. She also mentioned the difficulty due to the processes of the new system being interconnected, which demands a lot of attention (R5). In addition, it was found that the agility of processes and information from all sectors can generate financial gains for the company. It was also mentioned that the support provides help frequently and suggested more training (R7).

In the commercial sector, the employee also used only the new system due to the length of time she has worked in the company. According to her, the system is practical to use and easy to learn. She considers herself partially satisfied as a result of several problems she has been facing through the online system platform. The commercial sector listed safety, reliability, and completeness of the system (R5 and R6) as qualities.

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13 Extensible Markup Language
In the new system, the operation is considered easier and faster. In the customer, it can be filled in with all the information that comes out in the note, such as the type of freight, bank, nature of operation, term, IPI, and tax substitution. Everything is parameterized, thus avoiding possible errors. When the note is issued, it already comes with correct information and it is only necessary to verify it. GNRE can be generated by the system without the need to fill in the data on the website every time. It is possible to parameterize the IPI and tax substitution deadlines in the client itself and the processes are faster because the system allows several efficient functions and parameters.

The system itself is very good and served in several ways, but the service, support, and delivery of the initial proposal were insufficient. There is a project behind the entire implementation, from whether the server was compatible and supported a system with so many resources to the closing of a volume of goods in the shipment, from the beginning to the end of the production process (R1 and R7). All stages were studied and approved by a technical team of the new system. For better understanding, H3 has a VPN server "Virtual Private Network", that is, it does not have a physical server in the company. However, the project was approved in the same way, and the promise was that the system would work and deliver the requirements made in the budget.

In addition, the director also listed other problems such as:

- Slowness in the shipping process (reading and closing of the master box);
- Master box labels (each system update deconfigures the label and when the number of items exceeds the space of one label and moves on to the next, it also deconfigures);
- Cubage is not coming out on invoices;
- Manual for the write-off of waste (lack of training whose item was contracted);
- Slowness in the process of releasing production orders;
- Pending with product labels.

On numerous occasions, the implementation consultant was contacted, where he palliatively solved the problems. When calls are made via support, the director claims to have been attended by people who are not so specialized and have knowledge of the real problem. In this way, the opening of calls to try to resolve these issues was interrupted.

As negative points, we can mention the adaptation to the new system, which at first may not present ease or speed in the tasks during the implementation period. In addition, there

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14 Tax on Industrialized Products
15 National Guide to the Collection of State Taxes
was a delay of months after the implementation was started and there were still problems that were not solved. We can also mention as negative points the expressive cost of implementation, as well as the long-term return. Bear in mind that the biggest conflict is about the company that is doing the deployment. The biggest difficulty is not being able to find a definitive solution to recurring problems, especially those that compromise the agility of the system.

### 4.5 Comparative Analysis between the Old System and the New System

The application of the SWOT matrix is an important tool for the analysis of a situation or project, allowing you to identify strengths, weaknesses, opportunities, and threats. The SWOT matrix is made up of four quadrants:

1. **Strengths**: Characterize the internal aspects of the organization or project that are designed for its realization, such as skills, resources, experience, knowledge, etc.
2. **Weaknesses**: they characterize the internal aspects of the organization or project that are unfavorable to its realization, such as lack of skills, limited resources, lack of experience, etc.
3. **Opportunities**: characterize the external factors that can be exploited for the success of the project, such as changes in the market, new technologies, changes in competition, etc.
4. **Threats**: characterize the external factors that can harm the project, such as changes in the market, new technologies, changes in competition, etc.

The application of the SWOT matrix is an important tool for strategic decision-making, as it allows you to identify the strengths and weaknesses of the organization or project, as well as the opportunities and novelties of the external environment. With this information, it is possible to define strategies to seize opportunities and minimize threats, as well as identify areas for internal improvement (ELGUY, 2023). Table 2 shows the comparison between the systems derived from the interview data.

<table>
<thead>
<tr>
<th>SWOT matrix for the old system:</th>
<th>Forces</th>
<th>Weaknesses</th>
<th>Opportunities</th>
<th>Threats</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forces</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Good quality support while meeting the percentage required for the Simples Nacional modality.</td>
<td></td>
<td>Outdated technology.</td>
<td>Replacement with a new system that meets the company's needs.</td>
<td>Risk of obsolescence of the old system.</td>
</tr>
<tr>
<td>Used by the company for some time.</td>
<td></td>
<td>Lack of integration with other systems.</td>
<td>Possibility to improve efficiency and decision-making.</td>
<td>Potential integration issues with the new system.</td>
</tr>
</tbody>
</table>

Revista Gestão e Secretariado (GeSec), São Paulo, SP, v. 14, n. 12, 2023, p. 21625-21651.
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<table>
<thead>
<tr>
<th>Inability to meet the changing needs of users.</th>
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<tbody>
<tr>
<td>Lack of support and updates.</td>
</tr>
<tr>
<td>High maintenance costs.</td>
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<table>
<thead>
<tr>
<th>SWOT matrix for the new system:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Forces</strong></td>
</tr>
<tr>
<td>Use of modern technologies such as data analytics, cloud computing, and process automation.</td>
</tr>
<tr>
<td>Ability to analyze large volumes of data quickly and accurately.</td>
</tr>
<tr>
<td>Provision of relevant information for strategic decision-making.</td>
</tr>
</tbody>
</table>

Table 2: SWOT matrixes
Source: prepared by the authors (2023)

The SWOT analysis reveals that the old system had limitations due to outdated technology, lack of integration, changing user needs, lack of support, and high costs. On the other hand, the new system offers benefits such as the use of modern technologies, provision of relevant information, improved efficiency, and reduced operating costs.

**Conclusion**

We can conclude that implementing a new management information system has brought significant improvements to the company. The old system had limitations, such as outdated technology, lack of integration, changing user needs, lack of support and updates, and high costs. These limitations led the company to seek a new system that would better meet its needs.

The new system uses modern technologies such as artificial intelligence, real-time data analysis, cloud computing, and process automation. It is capable of analyzing large volumes of data quickly and accurately, providing relevant information for strategic decision-making. In addition, the new system brought improvements in efficiency, quality of information, internal communication, and reduction of operating costs.

However, the implementation of the new system also brought challenges, such as the significant initial investment, the ongoing costs of maintenance and upgrading, the resistance and difficulty of adaptation of employees, possible technical problems and failures in
improvements, and the time required for training and qualification of employees. These challenges can lead to dissatisfaction in the organization.

Despite the challenges, the financial gains provided by the new system are worth it. The company achieved greater assertiveness in production and purchasing, inventory control, agility in processes, and reduction of errors. In addition, the new system allowed for more accurate analysis and reporting, facilitating decision-making. However, it is important to note that the financial return on investment in the new system can be long-term.

Regarding user satisfaction, it was presented that there are positive and negative points. The automation of tasks and processes, improvement in the quality of information, facilitation of internal communication, identification of problem areas, and reduction of operating costs are aspects that generate satisfaction. On the other hand, the significant upfront investment, ongoing maintenance and upgrade costs, employee resistance, and potential technical issues can lead to dissatisfaction.

In conclusion, implementing the new management information system brought significant improvements to the company, such as greater efficiency, quality of information, reduction of operating costs, and agility in processes. However, the implementation of the new system has also brought challenges and can lead to dissatisfaction. The company must continue to monitor and evaluate the performance of the system, seeking solutions to the identified problems and ensuring user satisfaction.

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