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Failures in the implantation of Enterprise IT Application: Case studies and their main causes

Fracasos en la implantación de aplicaciones informáticas empresariales: Casos de estudio y sus principales causas

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Abstract. Although there are many studies on the main factors that lead to failure in implanting Enterprise I.T. Applications (EITA), EITA projects still have a high failure rate within the different implantation phases. In this literature review, several factors of failure in the implantation of EITA were analyzed, as well as various cases where there was a failed implantation of an EITA, to collect the different common causes and have a basis of recurring factors to be considered for future projects. The method used in the research was a literature review and a search for cases from 2015, where the common point is the failure in the implantation of EITAs. Subsequently, it was found that the factors detailed in the case studies are related to factors reviewed in the literature review, which means that these factors are recurrent and common. Finally, it was concluded that quality, management, time, and financial aspects are the factors that were generally relevant in the cases analyzed and that, despite the type or extent of the project, identifying these factors will determine early on the success or failure of the project.

Keywords: Failure, Software package, Cases, Implementation, ERP.

Resumen. Aunque existe una gran cantidad de estudios sobre los principales factores que conllevan al fracaso en la implantación de aplicaciones informáticas empresariales (AIE), todavía se tiene un alto índice de fracaso dentro de los proyectos de AIE dentro de las diferentes fases de la implantación, En esta investigación se analizó una serie de factores de fracaso dentro de la implantación de AIE, como también diferentes casos donde se produjo una implantación de una AIE fallida, con el objetivo de recopilar las diferentes causas comunes, y tener una base de factores recurrentes que se deberán tomar en cuenta para futuros proyectos. El método utilizado en la investigación fue mediante una revisión de la literatura, como también una búsqueda de casos ocurridos a partir de 2015, donde se tenga como punto en común los fracasos en la implantación de AIE. Posteriormente, se encontró que los factores detallados en los casos de estudio tienen relación con factores revisados en la revisión de la literatura, lo cual significa que estos factores son recurrentes y comunes. Finalmente se concluyó que la calidad, la gestión, el tiempo y el aspecto financiero son los factores que de forma general tuvieron relevancia en los casos analizados y que, a pesar del tipo o extensión del proyecto, la identificación de estos factores va a determinar de forma temprana el éxito o fracaso del proyecto.

Palabras clave: Fracaso, Paquete informático, Casos, Implantación. ERP.

Paper type: Review paper.

1 Introduction

This article is about the failure to implant Enterprise I.T. Applications (EITA). We define EITA as a ready-to-use software package such as Enterprise Resource Planning (ERP), Customer Relationship Management (CRM), Learning Management Systems (LMS), and Point of Sales (PoS) among the best known. These packages are called Customer off the Sell (COTS) or Ready User Software Product (RUSP).

Also, we will use the term implantation instead of implementation. We incorporate this term from the field of medical sciences, in the sense of inserting an external artifact (implanting) into the human body, such as a hip prosthesis, following the proposal of Reascos and Carvalho (Reascos Paredes & Carvalho, 2019).

It can be considered that the implantation of an Enterprise I.T. Application (EITA) can be a long and complex process, which is why there is a high rate of failed implantations, thus affecting business performance (Wong et al., 2005), as well as great economic losses (Kaisler et al., 2020; Nelson, 2011), affect processes, employees and even the culture of an organization (Coşkun et al., 2022). In borderline cases, where software projects have been canceled, they have generated a sense of despair and shame and even reached the point where these failures can kill companies (Ahonen & Savolainen, 2010).

A failure can be defined as cancellation of the implantation, inability to run the organization after implantation, disruption of production and normal workflow because of the new software, or a system put in place with inadequate features.

Failure rates vary throughout history, and in different studies, there are failure rates that vary between 30% and 70%, which also indicates that 57% of business software implantations take longer than expected, 54% exceed their budget, 41% fail to obtain more than 50% of the benefits and 40% manage to operate but later suffer an interruption, and finally delimiting that 32% of executives and 39% of employees are dissatisfied after implantation (Nelson, 2011).

Other studies suggest other failure rates where it is stated that 31% of the software projects were canceled, 53% had obstacles, and 16% were successful, thus adding a total failure rate of 84% (Saxena et al., 2016). The Standish Group, in its collection of information about failures in software projects, presents numbers for the year 2000, presenting 49% for projects that were questioned and 28% for those that were a complete failure (Eveleens & Verhoef, 2010), and for 2015 an encouraging figure of only 19% failure (Petter & Lee, 2015).

Enterprise I.T. Applications are in constant change; there are several problems when a company begins the implantation process in its organization, 25% of large projects are dissolved, exceed the budget 60%, 75% do not have the expected quality, and only 1% do not exceed the budget when delivering the product of the desired quality (Kheybari et al., 2020).

All these numbers indicate a common problem: a high failure level in EITA, which will be dealt with in this research. According to previous studies, they can be associated with a conflict with consultants (Wong et al., 2005) and poor management of the implantation process (Berhan et al., 2009), as it is also related to the complexity of the project, its architecture, its management structure, and the critical skills obtained by various people in the project (Kaisler et al., 2020).

In each failed implantation case, there will be a large number of factors and errors that were committed before, during, and after the EITA, and in this way, a large number of specific causes can be found for each situation. Citing an example known worldwide, we have Hershey, which experienced a failed implantation of an ERP by SAP in 1999, where its primary causes were an acceleration in the completion of the project, reducing the recommended term from 4 years to 30 months, and once completed, its transition to the new platform was made at the wrong time, which was a period where most orders were received. The executives did not underestimate the great work in getting the system up and running, and that additionally, the contribution of the test phase was decided, leading to relevant economic losses, as well as affecting the delivery of its products for the Halloween season, which is a crucial date for the candy producer, and thus leading to another set of consequences as part of poor implantation management (Daniels & LaMarsh, 2007)

It is of fundamental importance to analyze and understand each of these characteristics to get to the root of why these failures occurred, which will help to avoid similar mistakes in the future, learn from the experience obtained from the project and reduce these failure rates.

2 Methodology

In this literature review, where information from different scientific articles was collected and analyzed with an approach aimed at failures in implanting Enterprise I.T. Applications, which generally introduced fundamental concepts for the development of the investigation.

Subsequently, the compilation of different cases where a failed EITA is evidenced was carried out to analyze each case and reach a consensus on what would be the most frequent causes that led to the failure

of the implantation, as well as exploring what would be the common factors between the review of the literature and the case studies, and that together, all this knowledge is a helpful tool that will contribute to the creation of software projects that meet all expectations during and after their implantation.

The selected cases correspond to years after 2015, intending to have research with updated numbers, factors, and causes, and thus contrast with the different causes obtained previously with the literature review.

3 Fundamental concepts

3.1 What is software failure?

It can be defined as an inherent aspect between complex technological and organizational systems that can result from an accumulation of indicators of previous failures. It could also be defined as the difference between expected and observed performance (Saxena et al., 2016).

These failures can be classified into: Correspondence failures, which is defined as software project that does not correspond to the initially designed objectives; Process failure, which is a failure to produce a system within budgets and schedules; Failure of interaction, where the system does not satisfy the needs of the users that is evidenced in the level of use and degree of user satisfaction with the system; Expectation failures, which indicates the inability of the system to meet the expectations of a specific group of interested parties (Saxena et al., 2016).

3.2 Common factors of software failures

Each investigation identified a series of factors that led to the software's failure, which will be detailed below.

In the research "Critical Failure Factors in ERP Implementation" (Wong et al., 2005), the following factors are defined:

- Poor consultant effectiveness.
- Poor quality of BPR.
- Poor project management effectiveness.
- ERP software misfit.
- A high turnover rate of project team members.
- Over-reliance on heavy customization.
- Poor IT infrastructure.
- Poor knowledge transfer.
- Unclear concept of the nature and use of the ERP system from the Users' perspective.
- Unrealistic expectations from top management concerning the ERP systems.
- A project schedule is too tight.
- Users' resistance to change.
- Poor top management support.
- Poor quality of testing

In the research "Enterprise information systems project implementation" (Yusuf et al., 2004). The following more general factors are defined:

- Cultural problems.
- Business problems.
- Technical problems.

In the research "ERP failure: A systematic mapping of the literature" (Coşkun et al., 2022), factors found for each implantation phase are divided as shown in Figure 1.

Other failure factors found in the research: "Software engineering projects may fail before they are started: Post-mortem analysis of five canceled projects" (Ahonen & Savolainen, 2010), analyze different factors in different selected case studies, among which we can find: Insufficient number of reports and communication; They had opted for a type of light project management; There was no room for flexibility

in the schedule; Unavailability of the client's senior management for decision-making and approval of the different phases; The size of the project was much larger than previous projects; Coordination difficulties.

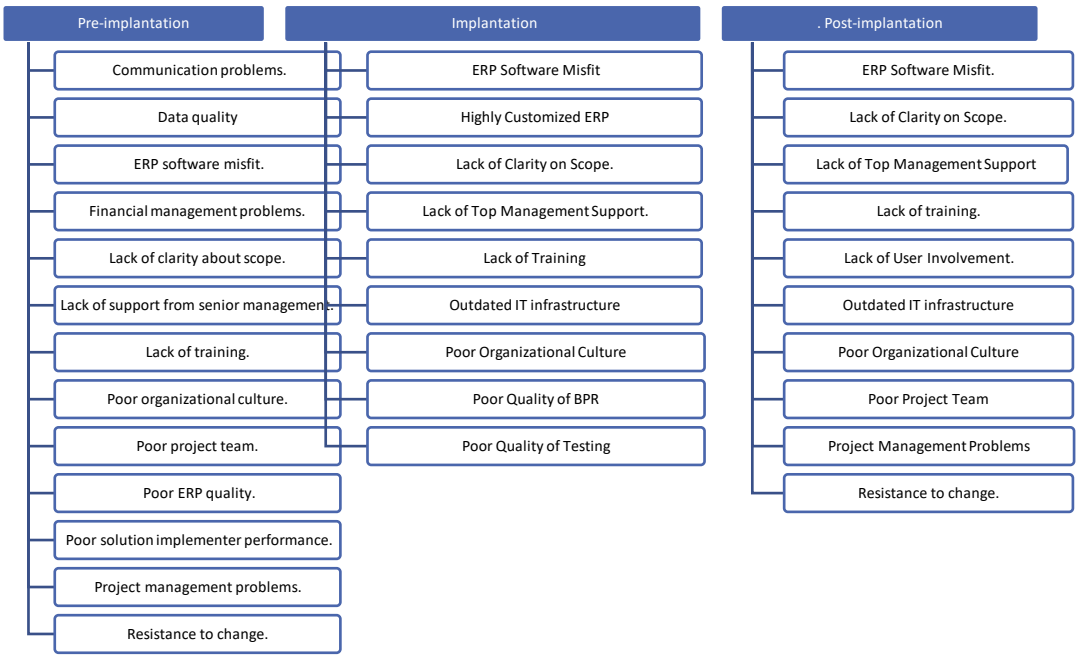

Figure 1. Relationship of failure factors with project phases adapted.

On the other hand, in the study "Evaluation of factors contributing to the failure of information systems in public universities: The case of Iran," he carries out a literary review and indicates that most of the studies focused on managerial and human aspects. Examining the causes of failure and finding the problem in five dimensions: project management, organization management, human, organizational, and technical relations (Kheybari et al., 2020).

In the particular case of the causes that lead to the failure of a Learning Management System (LMS), there are eight: creation and sharing of content, communicative characteristics, structure, commitment to learning, evaluation, user interfaces, social and informal learning, and characteristics. According to the study by Abdulsalam K. Alhazmi, two other factors influencing failure were a lack of learning features and limited mobile-based learning (Alhazmi et al., 2021).

In the global context, in recent decades, the Si has become a highly competitive environment and has the objective of improving customer service, reducing costs, and increasing productivity; despite this, the implantation of ERPs is expensive, complicated, and above all, they include high risks of failure, only around 50% are successful, 90% are delayed due to delays or budget overruns; therefore it is necessary to carry out studies to improve these rates in the implantation of ERPs (Chatzoglou et al., 2016).

How software failure can be evidenced in the set or presence of several factors, and within the different studies, common factors can be found, such as project management failure, lack of communication, and lack of support from senior management, among others, which allow us to give a vision that the failure in the implantation is not governed only by technical and system-specific aspects, but by lack of coordination and management of the project.

4 Study cases

4.1 Mission Produce Case

Mission Produce is a company dedicated to the distribution of avocados worldwide throughout the year, and by 2021 a new ERP system was implemented to have greater international growth and better viability operational and financial reporting capability (12 Famous ERP Disasters, Dustups, and Disappointments | CIO, n.d.).

But during the post-implantation, problems began with the new system, such as errors in the current avocado stock or the accounting of ripe avocados suitable for sale, many of which were not sold since they were not fit for sale. This problem meant contracting external companies so that the institution complies with its clients' orders and delivery commitments. It also found delays in the automated billing of its clients.

These issues arose in the first quarter when the institution's CEO Stephen Barnard called these failures "significant challenges," further adding that this occurred "despite countless hours spent on planning and preparing this conversion."

Consequently, there was a year-on-year drop of $22.2 million in gross profit for the first quarter after the ERP went live and an increase in operating expenses of approximately $4.1 million (Mission Produce Faces Operational Issues after Botched ERP Implementation | Supply Chain Dive n.d.).

The solution to this problem was the development of new processes to maintain the flow of information in the business, as well as the hiring of an external consultant that allowed the solution of the ERP system, which cost $3.8 million during the following nine months.

4.2 J&J Snack Foods

This company dedicated to the creation and distribution of frozen snacks and drinks decided to implement its ERP in the middle of the second fiscal quarter of 2020, which was a big mistake since the company had a great activity in that period, creating operating difficulties, from manufacturing and supply chains, affecting the overall performance of the company (12 Famous ERP Disasters, Dustups and Disappointments | CIO, n.d.).

Operational. The problem centers on the fact that the transition to the new ERP caused an interruption in production and that selection and scheduling issues arose during the implantation, leading to a lack of inventory visibility and thus increasing expenses by $4.5 million. It is also mentioned that the implantation was not within the schedule and budget.

Among the consequences was that the company lost $20 million in sales, generating a negative return on investment. According to the operating sector, this quarter would have succeeded if the ERP interruption had not existed. But it wasn't all negative. The frozen drinks section, run by another platform provided by Oracle and managed by JD Edwards, was not affected by the conversion, and experienced a 50% increase in sales.

As a final reflection, it is mentioned that: "Having a robust ERP platform provides a smoother integrated process from raw materials to production, storage, inventory management, and electronic order fulfillment" (ERP Implementation Woes Cost J&J Snack Foods Estimated $20M | Supply Chain Dive, n.d.).

4.3 LeasePlan Case

LeasePlan is a company dedicated to car leasing in 32 countries; it commissioned HCL Technologies in 2016 to develop a new Core leasing System (CLS) based on SAP, whose goal was to design, build and maintain a central leasing system. This project was intended to be a digital transformation for the company, where all the business areas' operations would be digitized.

At the beginning of 2018, there were already warnings regarding user access and change management in the CLS, proposing improvements for controls and I.T. governance because, in 2019, the migration to the CLS was planned in some countries without However, for this same year, the plan failed, and the project was abandoned.(Case Study 10: LeasePlan Paid $100 Million for a SAP System That Never Went Live - Henrico Dolfing, n.d.).

Among the main problems it is mentioned that the CLS would not be fit for purpose in the emerging digital world in which it operated, as well as trying to consolidate 35 systems on one platform, no learning from past failures of SAP in companies affiliates, a very aggressive and accelerated project plan was implemented, a Big Bang implantation strategy was followed that increased risks, the importance of organizational change management was underestimated (4 Lessons Learned From The LeasePlan ERP Failure, n.d.).

As a result, there was a loss of approximately $119 million in project costs, of which only $14 million was saved (4 Lessons Learned From The LeasePlan ERP Failure, n.d.).

Ultimately, as a solution, the company planned to build a modular system using better third-party components alongside its existing predictive maintenance, insurance claims, and contract management systems. It hoped this implantation would be more scalable and allow incremental product deployment and upgrades (12 Famous ERP Disasters, Dustups and Disappointments | CIO, n.d.).

4.4 Revlon Case

Revlon is a well-known cosmetics company that had experience in successful ERP implantations in its business, at that time working with Microsoft Dynamics A.X., and which, on the other hand, had the company Elizabeth Arden, Inc, which had a successful implantation with Oracle Fusion Applications. In 2016 Revlon acquired the company, Elizabeth Arden, Inc. Consequently, there was a need to integrate all business processes. A new provider called SAP HANNA was chosen, which led to a bad decision on the company's part (12 Famous ERP Disasters, Dustups and Disappointments | CIO, n.d.).

The competitive position of the company and the relationships it has with its customers [19]. The main issues were service level interruptions that affected the company's ability to manufacture certain quantities of certain products and meet large shipments to large retail customers in the U.S. These interruptions could negatively affect the company's position, according to Revlon (What Was the Real Story with the Revlon S/4HANA Failure? - Brightwork Research & Analysis, n.d.).

Among the main factors, it is mentioned that on the part of SAP HANNA there was a lack of design and maintenance of effective controls with the implantation. Another aspect that is taken into account is that a year before, the company was already experiencing operational and financial problems, which were related to the new acquisition of the Elizabeth Arden brand, and that despite these problems, the merger and implantation, leading to failure of the ERP (4 Lessons Learned From The LeasePlan ERP Failure, n.d.).

The failure to implement Revlon ERP created a massive financial setback, and in the fourth quarter of 2018, the company's net loss reached $70.3 million [20]. The company in charge of the implantation allocated $54 million intending to remedy the SAP interruption. It is also mentioned that the total number of real losses will likely be much higher and that the budget for said compensation may have underestimated the total costs (What Was the Real Story with the Revlon S/4HANA Failure? - Brightwork Research & Analysis, n.d.).

4.5 Lidl SAP Case

Lidl is a large German supermarket chain that, together with SAP, wanted to achieve a transition to a new electronic system. By 2011 the decision was already made to replace their old system with an SAP-based system provided by HANA because the previous system had reached capacity limits and, according to SAP, was hampered by process downtime, redundant storage of master data, integration gaps, and functional constraints, and a combination of countless interfaces and modules and a decentralized server structure made the task of running and maintaining the system increasingly complex (Lidl SAP Implementation Failure (ERP Failure Serie), n.d.).

By May 2015, the new electronic information and merchandise management system was launched for its stores in Austria, as well as in its centers and stores in Ireland and the U.S. By 2016, more than 30 existing infrastructure systems, and it was mentioned that with the new implantation, the company was positioning itself for the future. In 2017 there were certain unfavorable events for the company, including the resignation of CEO Seidel and the head of IT, Alexander Sonnenmoser. The company received an award from SAP this year for being one of its best clients. However, for 2018 it was decided to cancel the entire project because "the originally defined strategic objectives cannot be achieved with reasonable effort.".

Among the main problems that led to the cancellation of the service was that SAP's new system based its inventory on retail prices. At the same time, the company originally used to do so based on its purchase prices, which led the company to refuse to change its line of business and its processes. It was decided to customize the program as a solution, one of the key decisions that led to the project's failure (Case Study 12: Lidl's €500 Million SAP Debacle - Henrico Dolfing, n.d.).

Among the negative factors that stand out in this case is the requirements gap (Case Study 12: Lidl's €500 Million SAP Debacle - Henrico Dolfing, n.d.), since, as mentioned, SAP had taken into account other prices and to avoid the business mentality, it adapted to the software, which led to the fact that it was going to customize the software to match your business processes. Another factor that is considered is the project's duration since it is mentioned that the implantation of the ERP cannot last seven years because of the pace of business growth, as well as trade and distribution.

Executive turnover was also an aspect that the company suffered during the implantation since, in this way, it was difficult to maintain the alignment of the project. Each executive changed their priorities, causing the project team to lack direction.

Among the loss figures, there were approximately 500 million euros. The company also spent seven years on a project that did not allow the modernization and development of its business processes to be achieved as expected (Case Study 12: Lidl's €500 Million SAP Debacle - Henrico Dolfing, n.d.).

MoProSoft

The Mexican MoProSoft standard, which is in charge of improving the capacity to offer services with international quality of competitiveness to organizations linked to the development of large software maintenance in Mexico, most of these companies are classified as small and medium-sized, it is worth mentioning that the implementation of this policy has not been as expected, since for success it requires cultural and organizational changes, which are usually complex to address and require a large investment.

Social limiting factors:

- Resistance to change.
- Lack of communication.
- Poor management commitment.
- Poor staff involvement.
- Lack of motivation.
- Lack of collaboration and teamwork.
- Lack of consulting

Technological limiting factors:

- Lack of training in the use of tools.
- Lack of training in the use of tools.
- Poor technical management as a support for improvement.
- Limitations concerning tools for technological support of model execution and evaluation.

Process limiting factors:

- Lack of knowledge of the reference model.
- Lack of process culture.
- Complexity of processes.
- Lack of training in the use of processes.
- Inadequacies in knowledge management.
- Deficiencies in the organization and breakdown of responsibilities and tasks.

Limiting environmental factors:

- Insufficient dissemination of the model in the academic and business environment.
- Limited academy-business alignment

Twenty-one limiting factors were identified that, with adequate treatment, could be key for successfully implementing the MoProSoft model in software development organizations (Darias González et al., 2019).

Engineering is generally vested in uncertain requirements for many reasons, the same as measured in a business function, 70% of the respondents (87) had experienced problems in information systems projects concerning scheduling, based on the Project Management Body of Knowledge (PMBOK), six influential factors in the success or failure of software implementation were obtained: 1) absence of comprehensive leadership, 2) ignorance of costs, 3) neglected latent risks, 4) schedule tolerance, 5) psychology failed, and 6)ineffective communication (Sardjono & Retnowardhani, 2019).

In CODENSA S.A. a study is made of the main causes in which software development projects fail with historical records of this company, the work performs a qualitative research with a survey with information from different authors to take into account the perception of the 20 workers in the area of information systems that make up the Information Communication and Technology team of the company that have participated in software development projects, with relevant arguments after facing circumstances in the life cycle of the projects, among the five main causes stand out: 1) Incomplete requirements and specifications (95%) formulation stage, 2) Communication does not flow in all directions (95%) in the communication stage, 3) Matrix of roles and responsibilities deficient or nonexistent (75%) planning stage, 4) No methodologies to evaluate quality (70%) execution stage, 5) Insufficient involvement of users in the project (70%) execution stage, it is necessary to have preferably a suitable guide of priorities of activities through time (Rincón & Bacca, 2014).

In the work of Armijos and Delgado, where a systematic literature review on the identification of factors of success, failure, and risks in the adoption of free software, 85 final articles of 680 initial searches in three databases (IEEE Xplorer, ACM Digital Library, Springer Link) have been analyzed, of which: journal articles (27), book chapters (15), conference proceedings (42) and technical reports (1), in which eight categories, 17 sub-categories and 26 factors of failure in technology adoption were established, according to the research question: "What have been the factors of failure in the adoption of free software technologies in organizations? "The categories are: 1) competitiveness, 2) human factor, 3) licenses, 4) planning, 5) policies, 6) processes, 7) support, and 8) usability. It concludes that the competitiveness of free and open-source software against commercial offerings is the most cited in 26 articles (Armijos Mera & Delgado Guerrero, 2018; Carvallo Vega et al., 2018).

The model proposed by Pinto and Slevin identifies two critical factors in the development of projects; strategic and tactical; the first factor (strategic) contemplates the systems, business vision, implementation strategy, top management support, and project planning and programming, and the second refers to tactical factors: customer consulting, personnel, software configuration, customer approval, control and feedback, communication and problem-solving, the implementation results were not so positive although some of the objectives were achieved, the relative failure in new technologies is due to the difficulty of managing a large amount of information constantly growing in each organization (Fuentes Lombardo et al., 2001).

5 Results

In the analysis of the different cases, it was possible to find causes related to the factors found in the literature review since, despite the type or complexity of the software project, common or frequently repeated factors will always be found.

In case 1, it was possible to show that the factor of having a poor quality of ERP, and financial management problems, is common since, in this case, the software had deficiencies at the time of the stock accounting of its products, as well as also delays in automated billing to your customers. These failures did not allow the normal flow of work, bringing economic and reputational consequences to its clients.

In case 2, it was possible to show that the factor of having unsuitable software is in common since it encountered programming problems that led to difficulties in operation, manufacturing, and supply chains. In the same way, the factor of having a project schedule that was too tight and financial management problems had in common.

In case 3, the factors of a lack of clarity in the scope are common since it was mentioned that, in this case, the CLS was not suitable for its general purpose, as well as having a project schedule that was too tight, as well as project management problems, which led to a very accelerated and aggressive implantation with a high risk, and which also did not take into account the organization's change management.

In case 4, a deficient organizational culture and financial management problems are common since the implantation was carried out at a difficult time for the company, leading to its ERP's failure and legal issues with the company that carried it out—the implantation.

In case 5, it was possible to identify in common the factor of the high turnover rate of the members of the project team since, during the implantation, both the CEO and the I.T. manager resigned, which could cause a misalignment of the project objectives. In the same way, there was the unsuitable ERP software factor since the requirements presented by the software differed from the organization's business processes.

In case 6, the most relevant factors for the implementation of software are the social, technological, process, and environmental limitations, each one with sub characteristics among the main ones is the

resistance to change, lack of training of technological tools, absence of process culture as well as the absence of diffusion of the model in business and academic environments.

For case 7, the factors of success or failure in the implementation of software are lack of leadership, lack of knowledge of the company, carelessness in the risks, poor planning in the schedule, failed psychology, and ineffective communication, according to the results of the survey conducted with experts.

For case 8, the employees of the Information, Communication, and Technology department who participated in the survey highlighted five main factors in different stages of software development, such as incomplete requirements, not fluent communication, insufficient responsibilities, poor evaluation methodology, and lack of user commitment in the project, which is why they continue to carry out a guide of activities with priorities in time.

In case 9, where a systematic literature review is conducted, it is concluded that competitiveness, the human factor, licensing, planning, policies, processes, support, and usability are the most cited of the 85 articles analyzed.

In case 10, there are two critical factors, the strategic and tactical ones, among which the implementation strategy, customer consulting, system configuration, approval control, and feedback to the Customer stand out, which is why the large amount of information to be processed caused negative results in the software implementation.

6 Discussion

In this investigation, significant relationships are found between the causes found in the cases of software failures analyzed with the failure factors determined in the different investigations, which provides both a theoretical basis and a base of real instances in which these factors have arisen, and in this way, confirming and intertwining the information found.

It is considered pertinent that these factors are considered within the professional world of software engineering since it was verified that the failure of computer systems is not always focused on problems related to technology but also on cultural and business issues, as well as organizational factors, time, budget, among others.

Currently, there is a large amount of information and research about the factors of failure in software implantation, such as those presented in this investigation, and they must be analyzed; a way to mitigate these problems in the projects in which we are involved should be found, taking take into account the type of project, extension, financing, complexity, design, among others, as well as anticipate and define the factors that we consider could occur in our project.

As evidenced in each case, there were consequences, mostly financial, and that even came to paralyze operations and present difficulties in the general performance of the company, which allows us to reflect on taking time to analyze the factors of failure that at the beginning They may seem "insignificant," they could be crucial. They will allow us to anticipate big problems in the future.

In this investigation, there were certain limitations in the search for failed implantation cases within scientific databases since most of the most relevant cases analyzed as scientific publications were from years before 2015. Still, it managed to collect information from well-known forums and websites for greater reliability of the data.

7 Conclusion

The case studies showed that the causes that led to failure were factors that were present in previous projects and research, i.e., elements or patterns that were commonly repeated, indicating the importance of having a good phase of factors that will give guidelines on how to prevent negative events before, during and after implantation.

Among the factors that stood out the most in this research are the poor quality of the system, reduced implantation schedules, and budget, which indicates that, in general, the quality, time, and economic aspects are important and should be considered in the implantation.

Almost 40% of executives and users are unsatisfied with the delivered product. The failure rate of I.S.s ranges between 50% and 75%, especially due to a lack of budget and delay in project delivery. At least

31% of the projects are canceled, causing great economic losses to companies wishing to implement a software application.

In future works, it is proposed to analyze the current situation of the companies after the solution or replacement of corrupt or defective systems, as well as the analysis of the lessons learned from not having a correct analysis of failure factors.

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