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# Integrating the is Success Model in the Devel-opment of an Intranet Project

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# INTEGRATING THE IS SUCCESS MODEL IN THE DEVELOPMENT OF AN INTRANET PROJECT

*Research full-length paper*

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## Abstract

*In recent years, several intranet implementation projects have been developed in organizations. These solutions have proven useful for improving communication and collaboration between departments and other organizational structures. However, intranet implementation projects are not without risks, and their adoption must be adequately managed to reduce deployment errors, resistance to change, and other problems that typically arise in information systems development projects. In order to contribute to improving success, this article proposes the use of Delone and McLean's Information Systems (IS) Success Model in the project management of corporate intranets and describes the case of a project carried out in a multinational business group. Our findings show that this model can be very useful in the context of practical processes informing the evaluation of project results.*

Keywords: ISS Model, Delone *and* McLean, Intranet, Information systems development, Practice.

## 1 Introduction

Since their introduction a few decades ago, intranet solutions have grown in popularity due to their ability to connect people even when they are physically separated. Nowadays, many organizations, private or public, have intranet software to organize their internal information and communication (Schönian, 2022), share information, or support collaboration between departments (Damsgaard and Scheepers, 2001b).

Intranet definitions vary depending on the authors. However, there is one aspect in common with most definitions: almost all authors define an intranet as a private network of computers based on TCP/IP network protocols that belong to an organization, located inside its firewall, with access limited to members of the organization (Horton et al., 2001; Boersma and Kingma, 2006). In other words, an

intranet uses the same technologies and services as the Internet, and it can only be accessed internally by an organization to share information and improve communication.

Skok and Kalmanovitch (2005) identified three essential views on the intranet's role: cognitive, connectionist, and autopoietic. The cognitivist view sees the intranet as an information repository, culturally and socially neutral. From the connectionist view, an intranet is a tool that brings communities together to share and interpret information. Finally, the autopoietic view points out that much of the knowledge is implicit, stressing that its role is to provide data to identify relevant personnel in order to obtain the information.

Several authors pointed out substantial benefits arising from the intranet implementation (e.g., Sadiku and Akujuobi, 2022), such as higher efficiency, lower cost, greater stability, greater flexibility, and higher productivity. These benefits are similar to other information technology solutions (Vargas and Fontoura, 2024). However, some authors have even described the intranet as having the potential to do what other previously implemented tools and techniques have failed, such as, for example, business process reengineering (Roshan and Rao, 2016).

However, issues related to the user interface, such as navigation, search engines, the use of intelligent interfaces, and specific user customizations, have been identified as some of the main technical problems that need to be addressed to improve intranet adoption in organizations (Goswami et al., 2006).

Success and adoption models can be a valuable aid in this context as they identify variables that influence user behavior, the use of computer applications, and, ultimately, the success of endeavors. Some striking examples of these models are TAM (Davis, 1989), UTAUT (Venkatesh et al., 2003), and the Information Systems Success (ISS) Model (DeLone and McLean, 2016) (Varajão et al., 2022a). On the one hand, the scientific community has widely accepted these models, manifested in many theoretical works that mention, apply, and expand them. On the other hand, there are practically no proposals to promote their use in practice, resulting in the loss of important opportunities to leverage the results of projects.

This article proposes the use of the ISS Model in the project management of business intranets and describes a case of a project carried out in a multinational business group. The underlying research question is: How can theoretical success models be used in practice to improve project success? Our findings contribute to theory and practice by showing that theoretical success models can support the project success evaluation in practice.

The paper is structured as follows. In the next section, we present the theoretical background. In the third section, the research method is described. In the fourth section, the intranet implementation process is presented. The fifth section presents the results and discusses the use of the ISS Model in intranet project management. Finally, section 6 presents some final considerations and future work.

# 2 Background

## 2.1 Intranet – conceptual context

According to Benett (1997), the "intranet" concept began to be used in the 1990s to describe the use of Internet technology for internal communication in an organization. The intranet phenomenon was introduced by the idea that it can integrate all the computers, software, and databases within a particular organization into a single system that enables employees to find and share all the information they need for their work (Boersma and Kingma, 2006).

Intranet solutions have had a high level of adoption since their inception (Sillince et al., 1998). Intranets have been demonstrated to be useful for systematizing the explicit knowledge spread across or-

ganizational departments (Stewart, 1998) and sharing that knowledge (Akinosho et al., 2023). Nowadays, with increased concerns about security, intranets can play an essential role in organizations (Ma et al., 2019) and can serve as the central nervous system of any distributed automation system required to enable the Industrial Internet of Things (Schulz, 2016).

In a simplification of the concept, it is possible to state that an intranet is nothing more than the application of technology and standards used on the Internet (particularly the World Wide Web) but accessible only by a restricted user community, usually used by employees of an organization in particular (Sadiku and Akujuobi, 2022).

For many years, the intranet was viewed as an information channel for one-way communication with employees or a limited set of services. Beginning in 2004, a new perspective on the intranet emerged, making it a tool centered and focused on people and their needs, with a well-defined strategic objective to create an effective and complete workspace, to support the daily operations, and, finally, to support the organization's collaboration and communication (Corso et al., 2009).

According to Roshan and Rao (2016), the "ideal" intranet solution for an organization should be simple, reliable, and scalable, with users wanting to keep using the technology. More advanced intranet implementations expand organizational boundaries by supporting central processes and are becoming increasingly integrated with information management systems (Martini et al., 2009).

Intranet solutions are used in various functional areas (O'Flaherty and Williams, 2000). Among the many functions that can be found are storage (Welch and Pandey, 2007), research ((Roshan and Rao, 2016)) and access to information (Myerscough et al., 1997; Roshan and Rao, 2016; Stenmark, 2010; Welch and Pandey, 2007), documentation sharing (Myerscough et al., 1997), communication (Myerscough et al., 1997; Welch and Pandey, 2007) and collaboration (Roshan and Rao, 2016), news visualization (Stenmark, 2010), access to services (Roshan and Rao, 2016; Stenmark, 2010), discussion forums (Roshan and Rao, 2016; Stenmark, 2010), content management (Roshan and Rao, 2016), among others. Usually, the intranet access is controlled (Damsgaard and Scheepers, 2001b).

The impact of intranets on organizations has become more visible over time, particularly the intangible effects related to employee perception and behavior. According to Denton (2003), using an intranet makes employees feel more like they are part of the organization through what they read and leads to a more significant organizational commitment and better awareness of what is happening in the organization.

## 2.2 Intranet – motivations for implementation

According to Hustada and Vikstøl (2014), three main aspects make intranet attractive to organizations: 1) access to a global organizational system regardless of where one is located, 2) easy integration of information and knowledge, and 3) ease of connecting to organizational resources, colleagues and expertise. To better understand the motivations for the establishment of intranets, we examined the motivations in eight cases identified in the literature:

- The SIR IntraWeb is the name of an organization's intranet for research, development, and technological implementation in Africa. The main objective for implementing this intranet was to have the information processed on paper replaced by the intranet portal (Scheepers, 2003).
- The ABCCentral intranet is owned by ABC Incorporated, an organization that employed more than 40,000 people worldwide at the time of implementation. What motivated it was the creation of an expandable information system that would facilitate all employees' access to the information they need (Wagner et al., 2002).

- The intranet of XYZ Communications Corporation, a company located in the USA with approximately 300 employees spread over two locations, arose from the need to develop a solution to facilitate the sharing of the organization's data (Wagner et al., 2002).
- The IntraWeb is an intranet solution of PharmaCo. PharmaCo is a pharmaceutical company based in Northern Europe. Its creation aimed to improve communication and the ability to share knowledge between its organizational and geographical boundaries (Bansler et al., 2000).
- Telkom, a company located in South Africa, is one of the major providers of telephone services on the African continent. The main reason for creating the intranet was to create a corporate "content book" (Scheepers, 2003).
- LEGO Group is one of the world's largest and best-known toy manufacturing brands, and the company's intranet is called LEGO Web. The intranet was created to improve interdepartmental communication, avoiding using paper (Scheepers, 2003).
- Stream is Statkraft's intranet, a renewable energy supplier based on hydroelectric, wind, gas, and district heating. It is one of the major companies in this field in Europe. One of the intranet's main objectives was to solve problems found in a previously implemented intranet solution, to improve employee productivity, and, thus, improve business indicators (Han et al., 2015).
- Finally, in the case of BANK ABC, a financial services provider based in the United Kingdom, the objective of the intranet was to improve the existing intranet solution, offer a complete self-service solution for all employees, and have a significant impact on corporate communication (Baptista et al., 2006).

In most cases, the main objective was to reduce the use of physical paper and increase the organization's productivity. Improving communication within the organization is also one of the most cited motivations.

From the analysis of these cases, it is also clear that in the intranet projects, several positions can be defined, such as, for example: the business analyst (Roshan and Rao, 2016); the organizational sponsor, who is the one who realizes the potential of the technology, being in charge of allocating organizational resources for implementing it (Damsgaard and Scheepers, 2001a); the content provider (Goswami et al., 2006); the quality manager (Scheepers, 2003); the project leader (Scheepers, 2003); the Web coordinator, responsible for the overall structure and design (Scheepers, 2003); the intranet architect (Roshan and Rao, 2016) who, unlike the designer, is responsible for information management; the operational team, who have a fundamental role in updating and maintaining the intranet (Roshan and Rao, 2016); intranet development office (IDO) (Han et al., 2015); team of programmers (Scheepers, 2003); corporate software specialists (Wagner et al., 2002); webmaster (Bansler et al., 2000); and the sponsor of the intranet, which preserves the association between the intranet and the organization's objectives (Roshan and Rao, 2016).

## 2.3 Intranet – implementation challenges

Determining the objectives of the intranet turns out to be a crucial aspect of a project, as it promotes the implementation, design, and technology rules to reflect the real needs of employees and the organization. An intranet must meet the needs of employees when they are at work (Roshan and Rao, 2016).

The adoption of an intranet can bring several benefits to the organization (Queirós and Martins, 2012): use of a universal platform for communication; use of stable communication standards, universally accepted and adopted by the market; and use of a standardized visualization interface where the operating system is no longer important. These factors will positively influence the mechanisms that involve the exchange of information, thus promoting broader, faster, and higher quality accesses.

However, implementing an intranet entails risks, including the potential degradation of its operation, in most cases due to large overloads that occasionally occur (even if they are brief) and the excess of information that circulates within it (Queirós and Martins, 1997). It is also crucial to select the right equipment (Damsgaard and Scheepers, 2001b).

Several factors can influence the success of intranets, but the main factor is the attention that organizations expend on monitoring and managing the implementation as a process of organizational change. In cases of failure, it has been found that organizations only introduce tools and technologies without thinking about organizational measures, leading to a gap between perceived needs and proposed solutions, user dissatisfaction, and the consequent reduced use of the solution. Another frequent cause for failure in intranet projects is the considerable underestimation of the importance of organizational aspects. That is, most organizations manage implementation projects from a purely technical point of view without addressing organizational issues and the management of change in a systematic way (Martini et al., 2009).

According to Damsgaard and Scheepers (2001a), three challenges in intranet implementation need to be understood. First, an "organizational sponsor" will never be able to evolve beyond its emerging start if it does not use the technology. Secondly, the intranet will not move forward if core users cannot access content simultaneously. Finally, if the intranet remains inconsistent regarding content available on the various sites, it will be considered useless for users and no longer be used.

Considering the challenges mentioned by several authors, it is possible to notice that these are related to the quality of information (e.g., Damsgaard and Scheepers (2001a); Queirós and Martins (1997)), the quality of the system (e.g., Damsgaard and Scheepers (2001b); Queirós and Martins (1997)), the quality of service (e.g., Damsgaard and Scheepers (2001a); Roshan and Rao (2016)), the use of applications (e.g., Martini et al. (2009); Roshan and Rao (2016)), the user satisfaction (e.g., Martini et al. (2009); Roshan and Rao (2016)) and the business benefits (e.g., Martini et al. (2009); Queirós and Martins (1997); Roshan and Rao (2016)). The ISS Model, described in the next section, seeks precisely to characterize and establish a relationship between these constructs.

## 2.4 Information Systems Success Model

Mason's (1978) taxonomy of an information system identifies six dimensions for assessing information system success: System Quality (technical level), Information Quality (semantic level) and Use, User Satisfaction, Individual Impact, and Organizational Impact (level of influence). Based on these six dimensions, the Information Systems Success (ISS) Model was proposed by DeLone and McLean (Delone and McLean, 2003).

The Information Systems Success (ISS) Model was introduced in 1992. According to the first model version, the system quality and the information quality influence the use of technology and user satisfaction; the use and satisfaction influence personal and positive organizational impact.

After the publication of the first model, other authors suggested several updates. For example, in the first version, the concept of "Use" was considered ambiguous. In response to this issue, the variable "Intention to Use" was added to the construct "Use" (DeLone and McLean, 2016). Service Quality was also added to the model. The authors, instead of making the model more complex by adding more measures of success, decided to go in the opposite direction; that is, they grouped the impact measures in a single category called "Net Benefits." The model was updated to respond to these aspects, as shown in Figure 1.

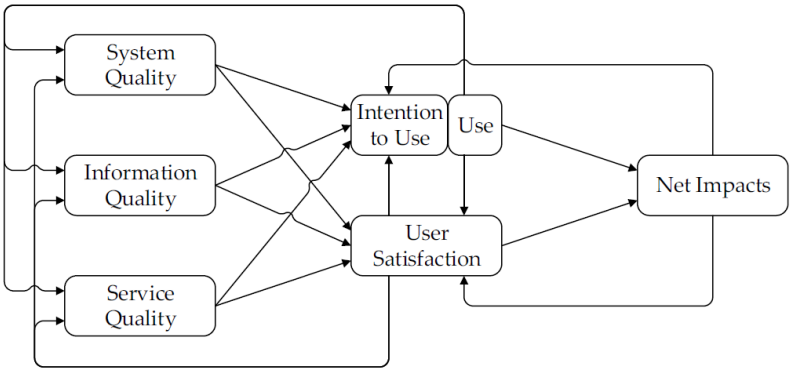


*Figure 1 Updated DeLone and McLean IS Success Model.*

*Source: (DeLone and McLean, 2016)*

The six dimensions that make up this model are explained below:

- Information Quality: Quality of the information produced by the system (e.g., relevance, accuracy, reliability, and completeness);
- System Quality: The characteristics considered most desirable for an information system (e.g., usability, system flexibility, system reliability, ease of learning, and system time response);
- Service Quality: The quality of support that users receive, whether by the organization or the service providers in the IT area (e.g., service responsiveness, technical competence, and reliability);
- Use/Intention to Use: Focus on the way employees and customers use the capabilities of the information system;
- User Satisfaction: User satisfaction level with the information system. This point becomes especially important when the user is obliged to use the system;
- Net Impacts: The extent to which information systems contribute (or not) to the success of individuals, groups, organizations, industries, and nations. These benefits must be determined by the context and objectives in which they are inserted.

# 3 Method

The research project presented here stemmed from the need to improve the existing intranet solution in the INTRASYS (anonymized name) business group, as it did not meet their needs. This organization, founded in 1998, is renowned for mobilizing funds and allocating resources for developing large-scale projects and complex infrastructure works in different areas. Focused on civil construction works, the organization began its activities in strategic sectors of the international economy with investments in clean energy, smart cities, sensing, and waste recovery. It operates in over 14 markets and employs more than 2000 people, with a greater concentration in Portugal, Angola, and Mozambique. In 2017, INTRASYS generated around 140 million euros in revenue.

The work in this project was developed using the action research methodology, which is fundamentally a practical and applied methodology driven by the need to solve real problems (Coutinho et al., 2009). Latorre (2003) described some of the characteristics that are considered essential in the methodology: it is participatory because people work intending to improve something; it follows an introspective spiral of cycles that include planning, action, observation, and reflection; it is collaborative because it involves group work by the people involved; it is also a methodology that creates communities of self-critical people, that is, people who participate and collaborate in all phases of the research

process; it is a systematic learning process, oriented towards practice, that is, it has a critically informed and committed action; and it is situational, aiming to diagnose and solve a problem found in a particular social context.

There are many alternatives to this methodology; the one chosen for this work was the Quigley and Kuhne (1997) model, which depicts action research as a cyclical process with three phases: planning, action, and reflection. As the name implies, the two objectives of this methodology are research and action to obtain results from both perspectives. On the one hand, the action aims to achieve organizational change. On the other hand, the research seeks to expand knowledge and improve the understanding of the phenomenon under investigation. These two perspectives are implemented through a cyclical or spiral process that alternates between action and critical reflection, and in which, in later cycles, the methods, data, and interpretation made in the light of experience (knowledge) obtained in the previous cycle are refined.

In the planning phase, the organization's problem regarding its intranet solution was initially identified. After correctly identifying the problem, we moved on to the project definition. In this stage, the engIS methodology (Carvalho et al., 2010) was used to characterize the company, characterize the organization's current intranet solution (AS-IS), and also plan the solution to be implemented through construction prototypes using specific software (TO-BE). In the action phase, the solution defined in the previous phase (planning phase) was implemented. An agile approach was followed for the implementation. This approach consisted generically of developing the solution incrementally. Using the ISS Model (DeLone and McLean, 2016) as the primary supporting reference, the effects of this intervention were assessed during the reflection phase. Since the process was cyclical, when the solution was not adequate, a second cycle was started, starting over at the planning stage, and so on. The project duration was about six months, and the evaluation involved five stakeholders.

# 4 Intranet implementation process

In order to better define an intranet solution to be implemented, it is necessary to address at least three questions: "What does the organization want to achieve with its intranet?" "What problems do the intranet need to solve in the organization?" and "What improvements are required?". Following the proper clarification of these questions, the intranet solution should have some characteristics that are expected, including being productive, accurate, complete, reliable, understandable, and concise in the information it provides, meet the user's needs, have a way for searching content and, last but not least, have a good information architecture (Roshan and Rao, 2016).

For developing the intranet, the engIS methodology (Carvalho et al., 2010) was adopted, which is divided into five main activities (A, B, C, D, and E) and three support activities (X1, X2, and X3), as shown in Figure 2. The following describes the methodology's five main activities used in this work.

The first activity carried out, Activity A - "Understanding/defining the organization," had as its main objective to obtain a global understanding of the reality of the organization, including the clarification of its purpose, business model, stakeholders, main activities, organizational structure, business ontology, and management indicators.

After obtaining this comprehensive understanding of the organization, we proceeded to Activity B - "Understanding/defining the information system." With this activity, we aimed to describe the existing intranet. Consequently, the "AS-IS" model (model of the existing situation) was produced. Additionally, benchmarking was done on another company's intranet portal within the same industry.

After Activity B, we proceed to Activity C - "Reformulation of the information system." Through this activity, the intranet's "TO-BE" model was created, defining the solution to be implemented.

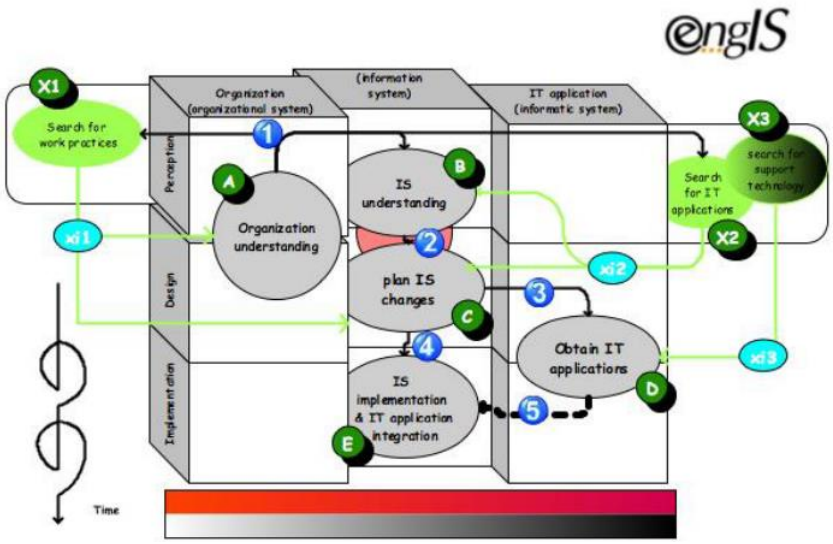


*Figure 2 EngIS Methodology*

*Source: (Carvalho et al., 2010)*

Activity D - "Obtaining (developing) computer applications" consists of developing the solution according to the "TO-BE" model to configure and make it available in the organization. Within the scope of this activity, a study and a training course in Sharepoint were carried out, and this technology was selected for development, together with Power BI and Microsoft Flow. Several meetings were held with those responsible for the various organization's departments throughout the development. Following an agile approach, each increment was presented to the stakeholders to get their feedback and suggestions for improvement. Until the solution reached the desired state, this cycle was repeated. A few sample screenshots of the final solution are shown in Figure 3.

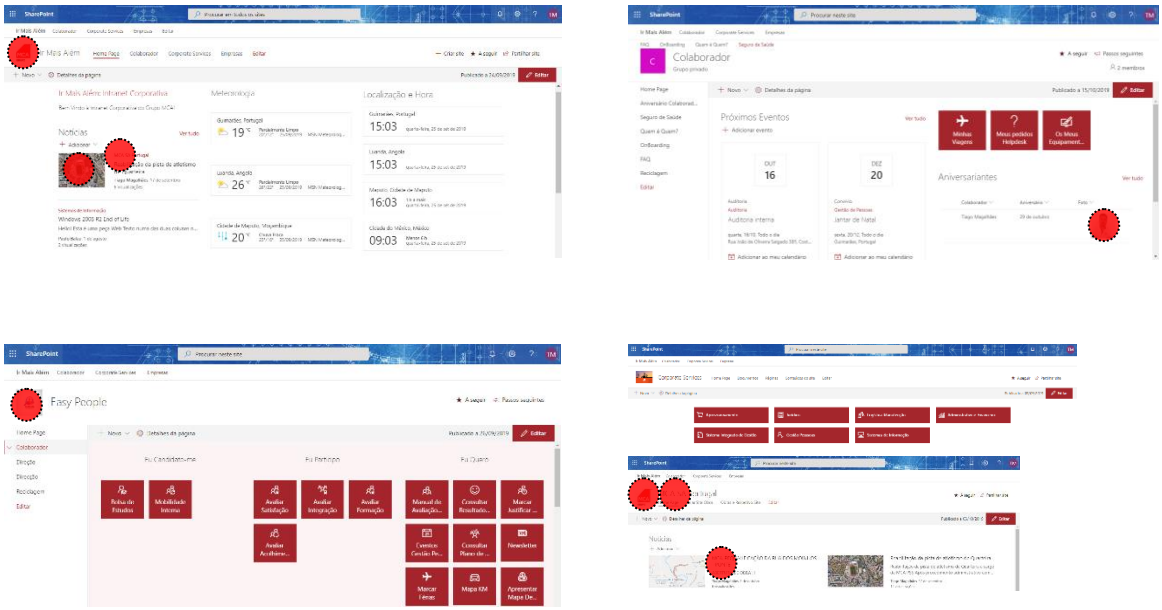

*Figure 3 Screenshots of the intranet*

Finally, Activity E - "IS Implementation," aimed to give the organization a new approach to handling information. It included uploading information on the intranet, demonstrating it to stakeholders, and evaluating the solution. In this activity, before the solution went into production, the ISS Model was used in the project management for evaluation purposes, as will be described in the next section.

# 5 Results and discussion of the ISS Model use in project management

According to Wagner et al. (2002), the development of an intranet has some peculiarities. One is the type of involvement of the user community. In a so-called conventional information systems development project, the responsibility for its development and maintenance post-implementation is typically the responsibility of the organization's information systems function. In the case of corporate intranet implementations, typically, the user community develops a functional model. Another difference is that an intranet frequently develops into a "living entity" within the organization; i.e., in the beginning, it may contain well-delimited information, but as users discover new ways to use the technology, it will probably start to grow, expand and consequently increase its complexity beyond the initial design. As a result, the management of the adoption process is critical.

In order to understand, a priori from the start of production of the intranet, the perceived quality of the information, the quality of the system, the quality of the service, the intention to use, the satisfaction, and the impacts of the solution, we carried out a survey to get the perspective of the intranet stakeholders (representatives). In other words, a pre-"Go-live" assessment of the solution was carried out using a questionnaire based on the ISS Model (DeLone and McLean, 2016) with the items in the appendix. The items and the respective sources were defined using the ISRI (Information Systems Research Indicators) platform (Varajão et al., 2021). The questionnaire was created based on several references that proposed indicators for the various ISS model constructs. Figures 4-8 show the results obtained according to the type of respondents: D - Developer (who developed the system); P - Sponsor (Chief Information Officer); U - Users (three key users who had access to the prototype). The scale used in the questionnaire ranged from 1 (very bad) to 7 (excellent).

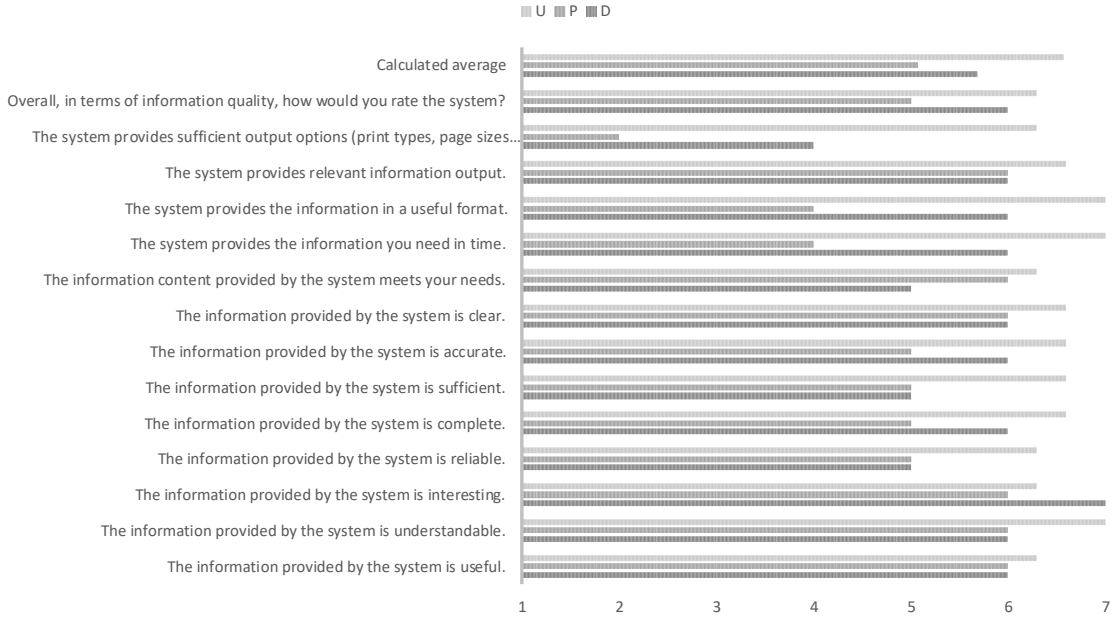


*Figure 4 Information quality*

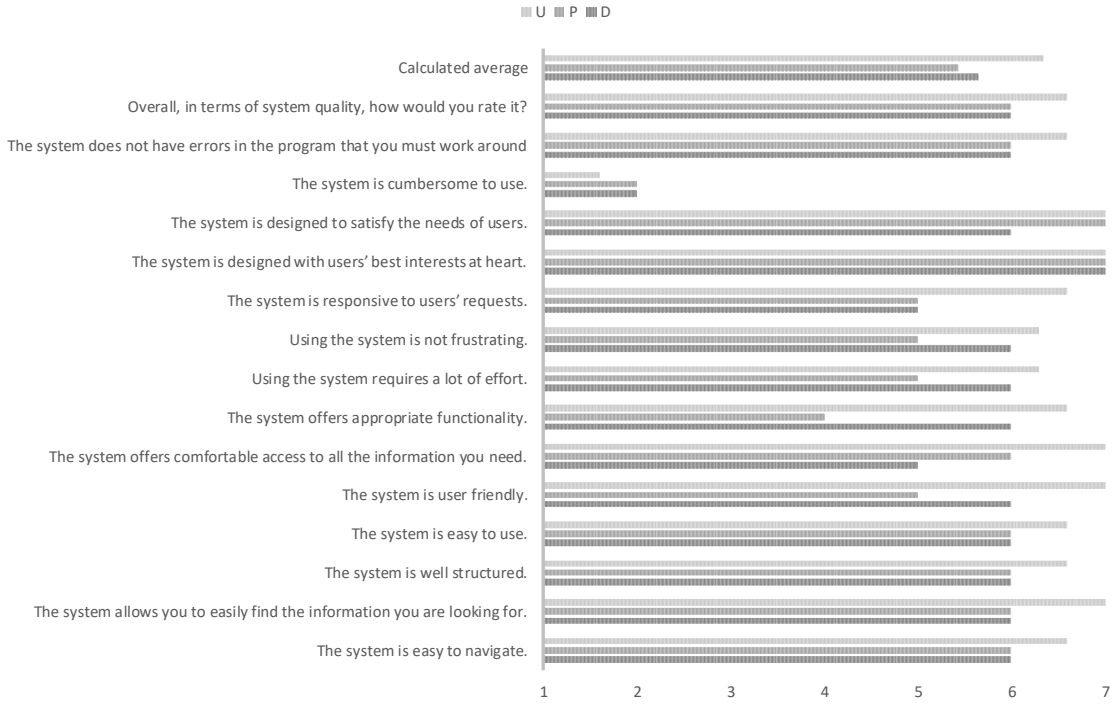


*Figure 5 System quality*

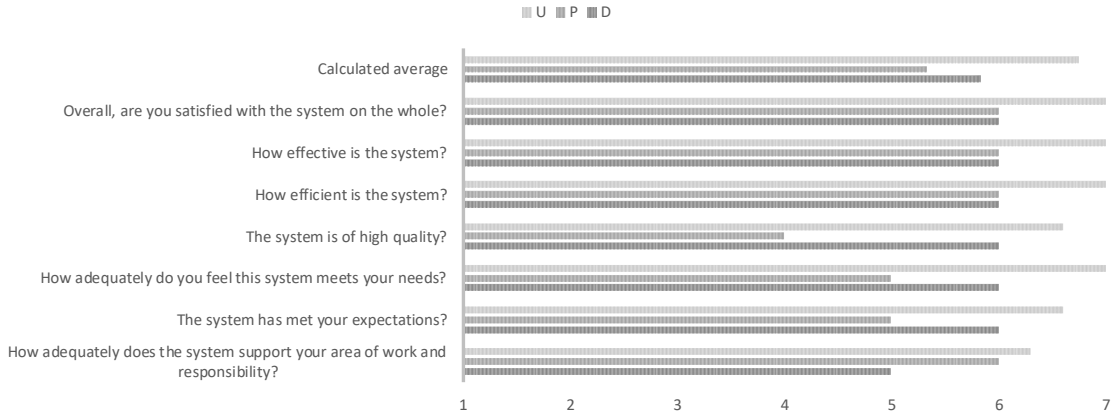


*Figure 6 User satisfaction*

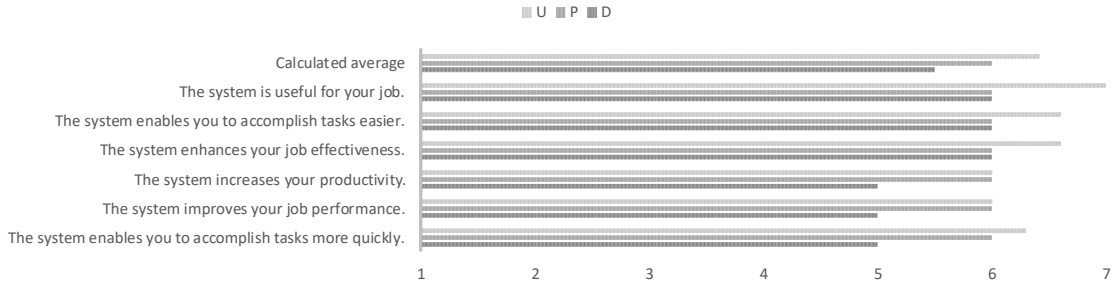


*Figure 7 Individual Impact*

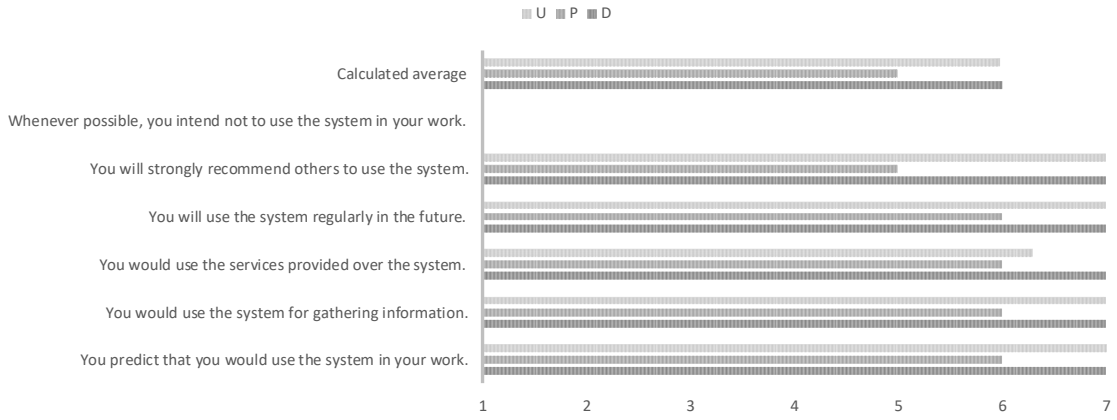


*Figure 8 Intention to use*

Although the version available to the different stakeholders was still a prototype version, the survey results allowed us to obtain a global and very realistic perspective of the potential results of the adoption and its influencers. In other words, they allowed not only to confirm the intranet viability but also to identify areas for improvement and differences in perception, contributing to ensuring software quality, which is fundamental in developing and maintaining information systems (Pfeiffer and Aaen, 2024). Regarding the impact on the organization, since the intranet was still a prototype at the time of this study, it was not possible to evaluate it.

In practice, when the project impact is assessed, this occurs, for example, three, six, or twelve months after the project has been concluded (Varajão and Trigo, 2016). However, some negative effects will no longer be avoided at that time. In today's competitive business landscape, project quality is of utmost importance as organizations strive to meet the ever-evolving needs of their stakeholders (Wawak, 2024). Assessing pre-go-live success makes it possible to avoid several problems that usually occur, identifying and solving any problems before the applications go into production, thus improving project output quality.

# 6 Conclusion and future work

On the one hand, the ISS model is widely accepted by the academic community. On the other hand, there are practically no studies describing its potential use in practice. Moreover, practitioners are not aware of several important information systems theoretical models, even though the adoption, use, and diffusion of information technology applications (together with their widespread success) are among the most popular topics in information systems research (Varajão et al., 2022a). Our findings show that the ISS model provides an important basis for evaluating intranet implementation success. Overall, we contribute to theory and practice by showing that theoretical success models can be very useful in supporting practical processes.

As with any research, this study has limitations. First, it is of limited generalization since only one case was studied. Second, only the ISS model was considered. Future work should address these limitations and explore other theoretical models (e.g., TAM, UTAUT, etc.) in practice and different types of projects (e.g., ERP, CRM, etc.). Moreover, as discussed by Varshosaz et al. (2021), the theories of adoption, use, and diffusion of information technology, integrated with success management processes (Varajão, 2016; Varajão et al., 2022b), have the potential to improve project management and require more research to explore it.

## Acknowledgments

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## Appendix - Evaluation questionnaire

### Information Quality Evaluation

| Indicator | Reference(s) |
|---|---|
| The information provided by the system is useful. | (Rai et al., 2002; Teo et al., 2008; Urbach et al., 2010) |
| The information provided by the system is understandable. | (Bradley et al., 2006; Rai et al., 2002; Teo et al., 2008; Urbach et al., 2010) |
| The information provided by the system is interesting. | (Teo et al., 2008; Urbach et al., 2010) |
| The information provided by the system is reliable. | (Bradley et al., 2006; Teo et al., 2008; Urbach et al., 2010; Wang and Liao, 2008) |
| The information provided by the system is complete. | (Bradley et al., 2006; Urbach et al., 2010) |
| The information provided by the system is sufficient. | (Rai et al., 2002; Teo et al., 2008) |
| The information provided by the system is accurate. | (Teo et al., 2008) |
| The information provided by the system is clear. | (Teo et al., 2008) |
| The information content provided by the system meets your needs. | (Rai et al., 2002; Wang and Liao, 2008) |
| The system provides the information you need in time. | (Teo et al., 2008) |
| The system provides the information in a useful format. | (Teo et al., 2008) |
| The system provides relevant information output. | (Bradley et al., 2006) |
| The system provides sufficient output options (print types, page sizes, etc.) for your use. | (Rai et al., 2002) |
| Overall, in terms of information quality, how would you rate the system? | (Wixom and Todd, 2005) |

### System Quality Evaluation

| Indicator | Reference(s) |
|---|---|
| The system is easy to navigate. | (Urbach et al., 2010) |
| The system allows you to find the information you are looking for easily. | (Urbach et al., 2010) |
| The system is well structured. | (Urbach et al., 2010) |
| The system is easy to use. | (Teo et al., 2008; Rai et al., 2002; Urbach et al., 2010, Wang and Liao, 2008) |
| The system is user-friendly. | (Rai et al., 2002; Teo et al., 2008; Wang and Liao, 2008) |
| The system offers comfortable access to all the information you need. | (Urbach et al., 2010) |
| The system offers appropriate functionality. | (Urbach et al., 2010) |
| Using the system requires a lot of effort. | (Teo et al., 2008) |
| Using the system is not frustrating. | (Teo et al., 2008) |
| The system is responsive to users' requests. | (Teo et al., 2008) |
| The system is designed with users' best interests at heart. | (Teo et al., 2008) |
| The system is designed to satisfy the needs of users. | (Teo et al., 2008) |
| The system is cumbersome to use. | (Teo et al., 2008) |
| The system does not have errors in the program that you must work around. | (Rai et al., 2002) |
| Overall, in terms of system quality, how would you rate it? | (Wixom and Todd, 2005) |

### User Satisfaction Evaluation

| Indicator | Reference(s) |
|---|---|
| How adequately does the system support your area of work and responsibility? | (Urbach et al., 2010) |
| Has the system met your expectations? | (Wang and Liao, 2008) |
| How adequately do you feel this system meets your needs? | (Teo et al., 2008) |
| Is the system of high quality? | (Wang and Liao, 2008) |
| How efficient is the system? | (Teo et al., 2008; Urbach et al., 2010) |
| How effective is the system? | (Urbach et al., 2010)<br>(Teo et al., 2008) |
| Overall, are you satisfied with the system? | (Rai et al., 2002; Teo et al., 2008; Wang and Liao, 2008) |

### Intention to Use

| Indicator | Reference(s) |
|---|---|
| You predict that you will use the system in your work. | (Son et al., 2006; Hong et al., 2014; Venkatesh and Davis, 2000; Venkatesh and Morris, 2000; Hu et al., 1999) |
| You would use the system to gather information. | (Carter and Bélanger, 2005) |
| You would use the services provided over the system. | (Carter and Bélanger, 2005; Hu et al., 1999) |
| You will use the system regularly in the future. | (Cheng, 2011; Dickinger et al., 2008; Hong et al., 2014; Son et al., 2006; Venkatesh et al., 2017) |
| You will strongly recommend that others use the system. | (Bouwman and Wijngaert, 2009; Cheng, 2011) |
| Whenever possible, you intend not to use the system in your work. | (Hu et al., 1999) |

### Individual Impact Evaluation

| Indicator | Reference(s) |
|---|---|
| The system enables you to accomplish tasks more quickly. | (Rai et al., 2002; Urbach et al., 2010) |
| The system improves your job performance. | (Rai et al., 2002; Urbach et al., 2010) |
| The system increases your productivity. | (Rai et al., 2002; Urbach et al., 2010) |
| The system enhances your job effectiveness. | (Rai et al., 2002; Urbach et al., 2010) |
| The system enables you to accomplish tasks more easily. | (Rai et al., 2002; Urbach et al., 2010) |
| The system is useful for your job. | (Rai et al., 2002; Urbach et al., 2010) |

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