

A Framework for Implanting EITA in SMEs: Leadership, communication, project management, and change management.

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ABSTRACT

One of the main problems in implanting enterprise applications in Small and Medium Enterprises (SMEs) is the lack of methodological support to guide SMEs and IT consultants in this process. Besides, there is little information about leading the implantation project, change management, leadership, and communication in an integrated way. This article's objective is to provide methodological guides that allow the implantation teams to carry out this management appropriately. This work is based on a field study and interviews with key informants who know about implanting Enterprise IT Applications (EITA) in SMEs. This research results in a descriptive framework that allows the joint management of these four transversal areas (leadership, communication, project management, and change management) and the two focus areas (processes and people).

Keywords: SIMPLE Framework, project management, change management, leadership, communication, ERP, CRM.

Resumen : Uno de los principales problemas en la implantación de aplicaciones empresariales en las Pequeñas y Medianas Empresas (PYMEs) es la falta de soporte metodológico para guiar a las PYMEs y a los consultores de TI en este proceso. Además, hay poca información sobre cómo dirigir el proyecto de implantación, la gestión del cambio, el liderazgo y la comunicación de forma integrada. El objetivo de este artículo es proporcionar guías metodológicas que permitan a los equipos de implantación llevar a cabo esta gestión de forma adecuada. Este trabajo se basa en un estudio de campo y en entrevistas con informantes conocedores de la inserción de Aplicaciones Informáticas Empresariales (ATI) en PYMEs. El resultado de esta investigación es un marco descriptivo que permite la gestión conjunta de estas cuatro áreas transversales (liderazgo, comunicación, gestión de proyectos y gestión del cambio) y las dos áreas de enfoque (procesos y personas).

Palabras clave: Marco SIMPLE, gestión de proyectos, gestión del cambio, liderazgo, comunicación, ERP, CRM.

Introducción

Currently, it is more advantageous for SMEs to acquire and implant an enterprise application than to develop one. The difficulty today is obtaining the potential benefits of IT as soon as possible, through a process that involves the selection, installation, configuration, and parameterization of COTS (Commercial-Off-The-Shelf) products; a load of existing information into the IT application; and continuing with its use.

Because of their reduced dimension and complexity, SMEs could be viewed as an accessible context for implanting IT applications. However, the reality is different. The literature reports the many failures SMEs face when implanting IT applications [1], [2] and the frequent problems encountered in the process: lack of proper planning [1], [3]; poor leadership [4]; difficulties in the selection of an adequate IT application [5]; IT capability limitations [6]; high costs of the implantation process [7]; poor fit between the application and the enterprise [4], [8], [9]; poor data quality [4], [10],

[11]; user resistance [4]; poor change management [8], [12], [13]; informal communication [5], [11]; difficulties on affording the extensive necessary training. [14]; problems with installing the new application in a heterogeneous and often incompatible infrastructure [2, 17]; difficulties after implantation [1], among the main.

As mentioned, there are problems in the implantation of enterprise software applications, most of which are due to the lack of proper management of the implantation process of these applications.

This research will propose a descriptive framework to manage a project's successful implementation to implant enterprise IT applications in SMEs. This framework is intended to guide the implantation team in activities related to Project Management, Change Management, Leadership, Communication, Process, and People.

This article is structured in the following way: It begins with the SME's characterization, the description of an Enterprise IT Application, and the justification for using the term

implantation. Next, the article presents the research design and the result of this research. The article ends by discussing the work done and proposes activities to be carried out in the future.

Background

Small and medium enterprises

Micro, small and medium-sized enterprises (SMEs) play a significant role in the world economy. They are a primary source of entrepreneurial skills, innovation, employment, and wealth creation.

By their nature, SMEs lack the resources and skills to carry out projects that involve the implantation of enterprise applications. Therefore, it is essential to develop methodological support for successfully managing these projects and be easy to apply for SMEs.

Enterprise IT Applications (EITA)

There is currently a wide variety of software packages that cover the information processing needs of many human and social endeavors. These software packages are named Commercial-Off-The-Shelf (COTS) products or Ready to Use Software Products (RUSP).

This article refers to such software packages as EITA- Enterprise IT Applications, namely those aiming to address the well-acknowledged needs of enterprises. Different categories of EITAs can be considered, depending on what enterprise areas they cover and the functionality they provide. Examples include point-of-sale (POS), BI & analytics, collaboration, customer relationship management (CRM), customer service, document management, content management, enterprise resource planning (ERP), finance, human resources, IT management, operations, supply-chain management (SCM), production, sales. There are no standard or well-established names for these products as they can appear in many configurations, allowing various functionality arrangements. Nevertheless, those names are widely used in the IT market. ERP products are an interesting case as they assure the essential functions of an enterprise.

Implantation vs. Implementation

The use of the term implementation is ambiguous. For professionals with a computer background, the term implementation is most often used to refer to software development or production. It is also used to describe the process of a software artifact's start-up (deploy).

To resolve this ambiguity, in this document, we propose to use the term "Implantation" of a computing device in analogy to the word used in medicine, where it is used as the action of inserting a device or tissue into a human body.

Following this analogy of medicine, when an implant is going to be made, it is necessary to find the suitable "device" which best suits the receptors' needs. Following or in parallel, the doctor should create the conditions required in the receptor to receive the new device. The implantation should be carried out following the protocols established for effect. Once the device is implanted, it should be avoided that the recipient rejects it. In the case of medicine, immunosuppressants are administered to accept the device in the recipient. It is necessary to emphasize that specialized professionals in the respective area must carry

out all this implantation process.

With this background, we will define the term implantation of an Enterprise IT Application as the action of inserting software ready to be used in the enterprise to optimize and automate the company's processes. For the implantation to be successful, professionals in the area who know the software product and the software product support processes must be carried out.

Also, we recognize that using the term "implantation" is unconventional in the IS community. At least in the Anglo-Saxon-influenced space, where "implementation" is the most used term to refer to the situation where an EITA is put in use in an enterprise. Nevertheless, it should be noted that in Spanish and French, the term "implantación" (Spanish, implantation - French) is often synonymous with implementation.

Research Design

This paper focuses on administrative issues that arise during the implantation of an EITA. It is necessary to mention that this article reuses the data collected in previous research that describes the process of implanting an EITA in SMEs -Simple Framework [17]-. That research began thinking about the identification of the implantation process of an Enterprise IT Application in the SME for which the following activities were carried out:

- literature review
- a case study in a car sales company
- a field study (interviews with professionals who implanted EITA in SMEs)

The Simple Framework provides an overview of central aspects SMEs should consider before, during, and after the EITA implantation. This framework attempts to describe the actors involved (external and internal); all the phases and stages through which an SME should go through the process of implanting an EITA; and the main factors that influence the successful implantation of an EITA in the SME.

We should mention that the SIMPLE Framework focuses on the implantation process, which is why cross-cutting activities are discussed very briefly. The objective of this article is to emphasize those management activities of the implantation project of an EITA which are not treated in the SIMPLE framework.

Literature review

The initial literature search, which served to approach the problem and detect existing gaps, was done in the AIS e-Library and Scopus because these two sources of information cover most of the research conducted in this field. The following search expression was used:

(Success OR Problems OR Difficulties OR Challenges OR Issues) AND (Implantation OR Implementation OR Adoption OR Selection) AND (Software package OR Commercial off-the-shelf OR COTS OR Enterprise application OR Information Systems OR IT application OR ERP OR CRM OR CMS OR DMS OR ECM) AND (Small and medium enterprise OR SME).

The four parts of the search expression reflect the several facets of the research questions. The initial search was done in April 2017. It led to 54 relevant articles that enabled us to find other relevant articles through backward and forward references. The investigation was later updated in April 2018, and a few new articles were identified and added. In total, 60 papers have been analyzed.

Case Study

The purpose of conducting a case study is to understand the implantation process of EITA in situ, the problems that arise, and the decisions made to overcome those problems in SMEs. This case study was conducted in a medium-sized car distribution enterprise in northern Ecuador.

The study involved interviews with personnel that participated in the project (the quality manager - 30', the IT manager of the vehicle trading enterprise - 90', and the manager of the enterprise that supplied the EITA and provided support - 60') and analysis of documentation produced during the project. The IT manager has later interviewed again - 30' to clarify issues during the data analysis. The interviews lasted an average of 60 minutes. The study followed the methodological recommendations issued by Yin [18].

Field study

Subsequently, based on the results of the Case Study, we conducted a field study. This study consists of interviews with the stakeholders involved in implanting an EITA in the SME. We conducted forty-eight interviews with stakeholders participating in

SMEs' EITA implantation processes. The stakeholder interviewed are divided into the following groups: CEO of software-producing enterprises, consultants, SME support technicians who implanted an EITA, and SMEs that do not have an EITA.

Interviewees were from different countries (Ecuador, Portugal, Spain, Mexico, and Argentina). They were opportunistically selected based on acquaintances of the researchers and on a search on LinkedIn of professionals that mentioned the experience of participation in EITA implantation projects. The interviews had an average duration of 45 minutes.

Data Analysis

Interviews were recorded and transcribed using the clean verbatim technique. A clean verbatim transcript is ideal for qualitative research.

Content analysis of transcriptions was supported by the MaxQDA v.18 software tool. Following the recommendations of Kuckartz [19], the study of the interviews involved the establishment of coding that included categories and subcategories (codes, sub-codes) that emerged from the data with an inductive approach, according to the researcher's understanding of the phenomenon.

Data analysis of the interviews' transcripts took a basis the codebook established in the exploratory case study. During the analysis, new categories and subcategories were created to tackle aspects that appeared for the first time in the interviews. As the analysis progressed, it became necessary to reorganize the coding because the researcher was incorporating more information and was improving his understanding of the phenomenon.

Finally, when performing the analysis of the coding obtained, it was also necessary to reorganize (debug) the codes and sub-codes, sometimes because there were repeated codes, at other times to group the coding into broader categories or to improve its structure coding. Figure 1 shows the codes obtained in project management and change management.

Category	Sub-category	Count	Category	Sub-category	Count
Project Management	Interlocutor	21	Change Management	Comunicación	18
	Gestion del Proyecto	10		Resistencia	9
	Elaboración del Proyecto	10		Usuario debe estar involucrado	8
	Aplicación de metodología	9		Gestion del cambio	6
	Gestion conjunta del proyecto	8		Encontrar empatia con el usuario	5
	Control del proyecto	7		Barreras generacionales	5
	Retrasos en la planificacion	5		Constante capacitacion	4
	Cronograma	3		Presentacion - Lanzamiento del Proyecto	3
	Gestor del proyecto del lado del cliente es raro	3		Liderado por directivos	2
	Estimación adecuada	3		Colaboración de áreas y personas	2
	Gestor externo del proyecto	2		Satisfacción de usuarios	2
	Identificación de Riesgos	2		No se contrató consultores externos	2
	Proveedor no tiene metodología de implantacion	2		Trabajar con recursos humanos	2
	Planificación inicial	2		Elegir usuarios claves adecuados	2
	TDRs ayudan a cumplir tiempos	2		Imposible satisfacer a todos	1
	MIP Metodología de Implementacion Primavera	2		Todos se tienen que adaptar a las nuevas formas ...	1
	Buena comunicacion del gestor de proyecto	2		Presentación del equipo de implantacion	1
	Todo el tiempo trabajar con usuarios lideres	1		Jornadas de integracion	1
	Trabajar con el area contable	1		Perdida de funcionalidad	1
	Pruebas con usuarios lideres	1		En general se ganó	1

Fig. 1. Codes obtained in the categories Project management and change management.

Results

In this research, we detected two critical focus areas that should be considered when implanting an EITA in the SME: People (the persons that work in the SME) and processes (the structure of the work executed by the persons and by IT products and other equipment). Most of the activities carried out during the process of EITA implantation will affect these two areas. Therefore, they deserve special attention.

Persons

A sensitive issue in the implantation of an EITA is the persons that will use the EITA and will be affected by its use. Persons have differences (generational, cultural, and social, among others). Therefore, they must be treated differently.

We must also consider that this project generates resistance to change (characteristic of human nature). This is due to circumstances such as the fear of experiencing new forms of work, loss of power, insecurity due to lack of knowledge, and doubts about job stability, among others.

For this reason, when a project of this nature starts, it is necessary to plan, in an appropriate way, how to deal with the people and how the change will be managed. The workload during the implantation period can double as, besides their regular duties, they will have to dedicate time to activities related to the implantation process.

One of the critical aspects of the implantation process to be successful is to prepare people, that is, to provide training and coaching—this demand defines the training needs of future EITA users and SME managers. The training must cover different areas such as management, processes, technology, and the EITA.

If the enterprise has many employees, the training can be carried out in two stages: first, to train the primary users or heads of areas; later, those already prepared will teach the rest of the staff in their work area. One aspect to highlight is that training should be constant; that is, it should be done before, during, and after the implantation of the EITA.

Processes

For the successful implantation of an EITA in an SME, it is first necessary to establish the SME needs and define the processes that will be supported/automated. The problem with SMEs is that their management is very informal, lacking the formalization of work structures and processes.

This makes it difficult to identify/define technological needs and hinders EITA's search, evaluation, and selection. The proposal for SMEs is to determine their processes according to their needs. These processes will be the basis for selecting the software to obtain. Otherwise, the SME processes will be governed by the EITA, which usually embeds standard, widespread practices for operations and management. Adjusting to the EITA processes is better and more profitable if the SME has a typical operation and administration. But if the SME bases its competitive advantage on differentiated procedures and agile management practices, implanting an EITA can result in losing its competitive advantage. In these cases, it is better to develop custom software that fits differentiated processes and agile management practices.

In some SMEs, the formalization of processes appears with the implantation of EITA. The business application is the change engine and organizes the enterprise based on the process models embedded in the software.

Before implementing the EITA, preparing the enterprise for the change is advisable. Besides studying the persons affected by the change, doing that involves documenting the processes or even reengineering them, taking into consideration the needs of the company and the potential of current technologies. After defining the processes, the SME must search, evaluate, and select the EITA that meets the established procedures.

In addition to these two critical areas, four cross-cutting areas must be considered: leadership, communication, change management, and project management. The implantation team must carefully consider these cross-cutting areas during EITA implantation. Neglecting these areas will hinder the success of the EITA implantation and can lead to failure.

Leadership

Leadership in these projects is fundamental because, at certain times, difficult decisions must be made for the continuity of the project. Delegating this leadership without the power to decide complicates the process of implanting the EITA. On the other hand, these leaders must be aware of the benefits to obtain, and preferably they must have specific knowledge of the processes to be automated.

If possible, a project of this nature should be led by the general manager if the project involves the whole enterprise; by the area manager if the project includes a specific area.

Here are some leadership requirements that we identified and classified according to Action Centred Leadership (ACL) framework [20]:

- To accomplish the task
 - Establish the scope and objectives of the project
 - Efficient resource management
 - Capability to make decisions
- Build and maintain the team
 - Firm leadership
 - Promote teamwork
 - Know the operation of the enterprise
 - Share the vision
 - Establish enterprise policies
 - Motivate the work team
 - Comply and enforce the plans
- Development of the individual or person
 - Convinced of the change
 - Manage expectations
 - Transmit confidence and security
 - Transparent
 - Minimizes uncertainty
 - Be an agent of change

Communication

Adequate communication is the difference between the success and failure of the project. It is for this reason that a project launch is a critical moment. The launch of the project should involve the personnel; here, it is explained what it is intended to do with the implantation of the EITA, how it will be done, and what the expected results are. This communication process must be regular during the project and involve all the staff. For this reason, the project leader should use several channels (work meetings, email, social networks groups, etc.).

Below we present a summary of the aspects to be considered in the communication issue in an EITA implantation project in the SME.

- Communication plan
 - Vision
 - Reasons
 - Final Goal
 - Project stages
- Policies and channels
 - Define policies (internal and external)
 - Define channels (newsletters, memo, phone, e-mail, conference, internal social media, etc.)
 - Define cases to use briefings, presentations, and meetings.
- Socialization
 - Communicate the purpose
 - Make the presentation and launch the project
 - Internal promotion
 - Presentation of the implantation team
 - Integration workshops (consultants, enterprise staff)
 - Benefits

Project Management

The process of implanting an EITA must be done in at least two phases (two projects): The first one is during the pre-implantation phase, in which the objective is to select the EITA and its provider. This sub-project must be managed exclusively by the SME or with the help of an independent expert.

The second sub-project encompasses the phases of implantation and post-implantation, in which the objective is to implant or put into operation the EITA in the SME and provide technical support. The EITA provider manages this sub-project involving the SME staff. The project's success depends on several aspects: adequate planning, monitoring, and control from the two parties (EITA provider and SME); use of an implantation methodology; communication between SME staff and the EITA provider's implantation team.

Furthermore, we identify that these projects can vary from minor to larger, depending on the size of the enterprise and the application to be implanted.

Besides, a significant part of the professionals who implant an EITA carry out the planning of the implantation project following the regulations of the Project Management Institute (cf. Fig 2) from a technical and business perspective. That is, the consultants concentrate their efforts on the technical and business side, leaving aside people who, in our opinion, are who facilitate or hinder the EITA implantation process.

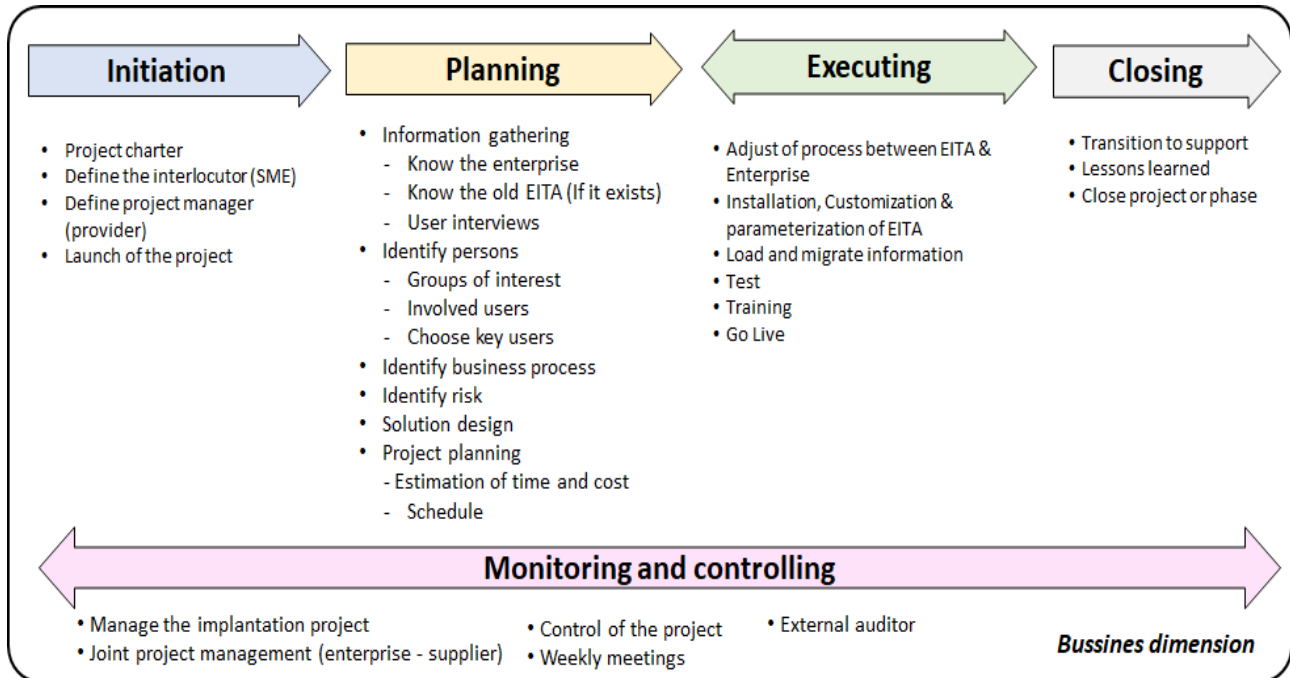


Fig. 2. Project management process in the implantation of EITA, based on PMI [21]

Change management

Change management in an SME EITA implantation project involves dealing with users to minimize risks and maximize benefits. In this type of project, there will always be resistance to change due to human nature (fear of the unknown and uncertainty).

There are several models to guide change management. The following are the most cited in the literature: Kotter’s eight steps of change [22]; Lewin’s change management model [23]; McKinsey 7S Model [24]; A Model of Organizational Performance and Change [25]; “AMIGO” Model [26]; and ADKAR Model [27].

In addition to models that aim to lead change, some models explain the transition or response of people in a situation of change. The Kübler – Ross model [28] is such an example. From this model, others have been derived: Bridges’ transition model [29]; Scott and Jaffe’s Change Model [30].

Fig. 3 shows the general process that addresses the change management in EITAs implantation projects; it was obtained through the interviews in this study. Managing change means considering the human side in the direction of projects related to the implantation of EITAs.

Fig. 3 depicts a process of dealing with change management, highlighting five key areas: leadership, communication, preparing the enterprise, involving people, and preparing the person. We briefly describe each topic below.

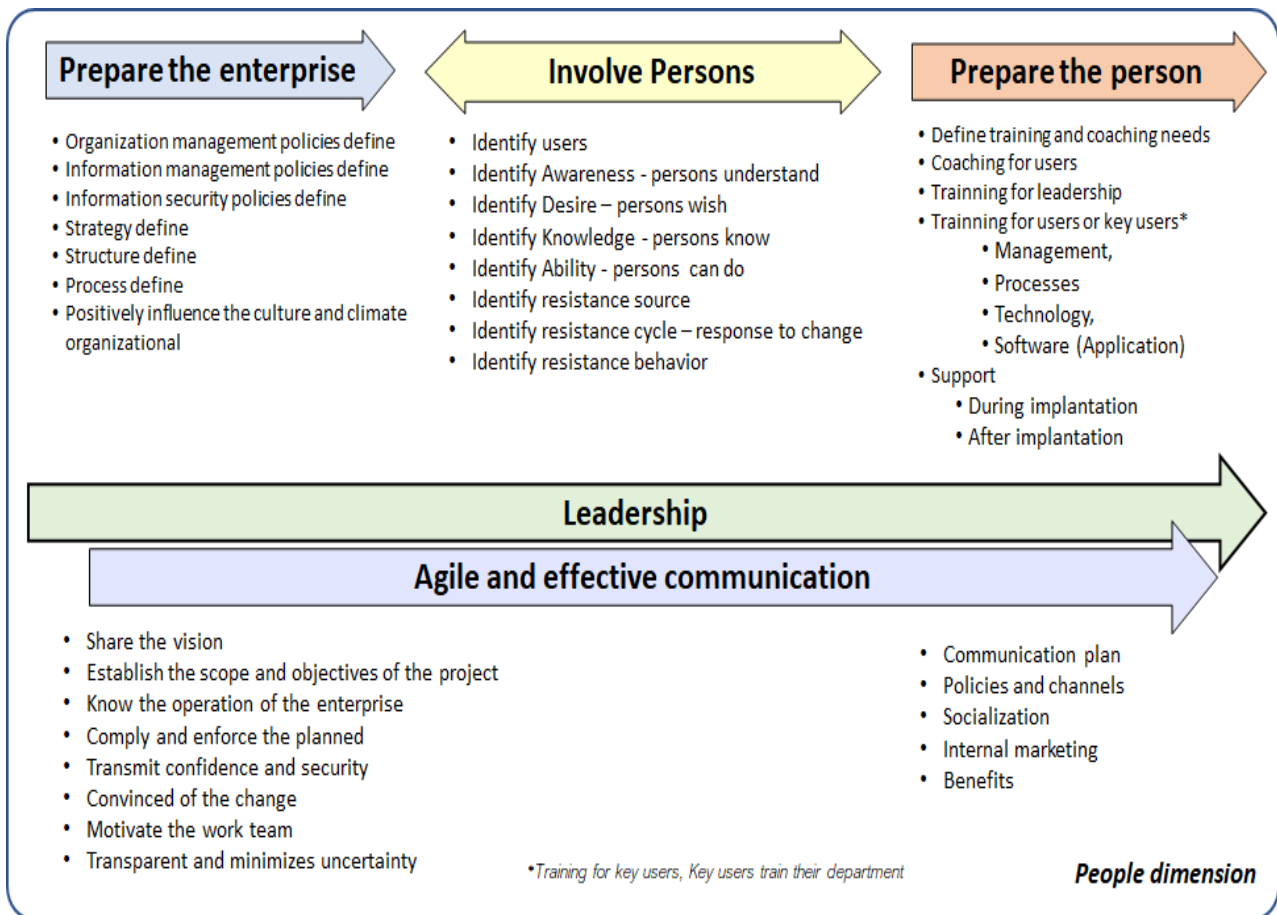


Fig. 3. Change management process for the EITA implantation in SME

Prepare the enterprise. For the successful implantation of an EITA in an enterprise, it is first necessary to recognize what is needed, define the processes that will be automated, and define management policies at various levels (organization, information, security, among others). The critical problem is the lack of formalized processes and policies. Preparing the enterprise for change involves high-level decisions such as defining the organization's strategy (the reason for change) and determining the company's structure, processes, and policies based on this strategy. It is also necessary to influence the culture and organizational climate positively. Aspects to consider in the preparation of the enterprise are the following:

- Define policies for enterprise management
- Define policies for information management
- Define policies for Information security
- Define the strategy,
- Define the structure
- Define the process
- Positively influence the culture and climate of organizational

Involve people. A sensitive issue in the implantation of EITA is people. People have differences (generational, cultural, social, etc.), and, as such, the treatment must also be different. It should also be borne in mind that in this type of project, there will initially be resistance to change since it is characteristic of human nature and is due to circumstances such as fear (experimenting with new ways of working, unknown, losing power) and insecurity (due to lack of knowledge, doubt of stability), among others. In the process of change, it is essential to involve people. For this, we have classified some aspects to consider:

- Users
 - Identify users
 - Identify groups of interest
 - Identify change agents
 - Predict response to change
- Identify the source of resistance:
 - At the individual level
 - At the organizational level
 - To the process
 - To software
- Identify resistance behavior:
 - Users who accept the change
 - Indifferent users
 - Users with passive resistance
 - Users with active resistance
- Identify response to user change:
 - The user is in a denial state
 - The user is in a resistance state
 - The user is in an exploration state
 - The user is in a commitment state
- Identify if users are aware (people understand) of:
 - The need to change
 - How the company will change
 - The impacts of the change
- Identify users' wishes (people wish):
 - For opportunities
 - For stability

- For growth
- Identify if the user knows (people know):
 - The work management
 - Their business processes
 - About information technology
- Identify user ability (people can do) in:
 - Managing their work
 - The use of business processes
 - The use of information technology

Prepare the person. One of the most challenging activities for managing change is preparing the person. Developing a person involves working from two perspectives: emotional and rational. The emotional side touches on awareness and desire. The sensible side has to do with training and the development of skills. The project's steering committee should use different strategies, such as coaching, training, interactions with colleagues, reference materials, online resources, super-user support, job aids, etc. Here are some guidelines to prepare people:

- Define training and coaching needs
- Coaching for users
- Training for leadership
- Training for users or critical users*
 - Management,
 - Processes
 - Technology,
 - Software (Application)
- Support
 - During implantation
 - After implantation

* Training for critical users, Key users train their department

Finally, suppose we combine the four cross-cutting areas (leadership, communication, project management, and change management) with the two focus areas (Processes and people). In that case, we obtain the SIMPLE Framework for managing the Implantation of an EITA in SMEs. See Fig. 4.

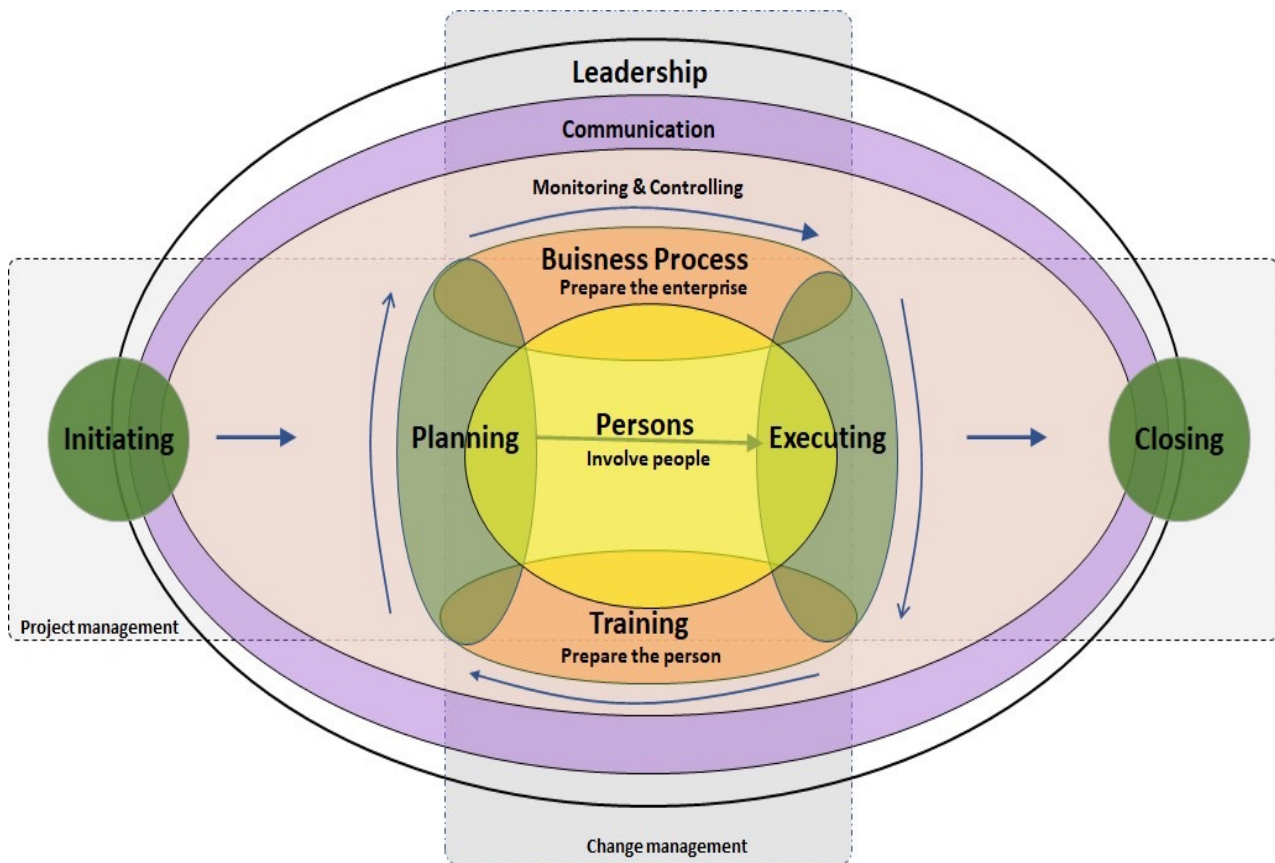


Fig. 4. Framework Simple for management of the EITA implantation in SME

Discussion

Although created as a descriptive model, the Simple framework for the successful management of EITA implantation in SMEs is a solid basis to a prescriptive model to be used in EITA implantation projects in SMEs.

The implantation team must carefully consider these cross-cutting areas (leadership, communication, project management, and change management) during the entire EITA implantation process. These areas are often neglected in the EITA implantation processes.

The focus areas (people and processes) deserve special attention. Most of the activities carried out during the process of EITA implantation will affect these two areas.

We can conclude that these four cross-cutting areas and two focus areas must be treated together and not isolated for the successful implantation of the EITA in the SME.

One limitation is related to the data collection, to access professionals who have experience in implanting EITA in SMEs. The research was conducted with professionals from Ecuador, Portugal, Spain, Argentina, Mexico, and Cuba; Iberic-American countries, where people's cultures can be more relaxed compared to other cultures. This may somehow influence the model obtained.

In the future, instruments could be proposed to characterize users, such as identifying the users, source of resistance, resistance behavior, response to change, etc.

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