Agile Methodologies based Method for the UDA-ERP Software Implementation

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Abstract

Enterprise resource planning could be discussed for an organization in the SME sector due to the processes required to adopt it. On the other side, agile deployment methods contribute to reaching the development and implementation objectives based on the user experience through incremental deliverable software components. In this paper, we researched the application of the Lean Thinking (Kanban) methodology and Agile Deployment Methods to propose a method that collects a set of activities for its implementation. Two scenarios were considered for the UDA - ERP software validation: i) deployment of a software module without an implementation method and ii) deployment of a software module applying the proposed method. Consequently, the Servqual and User Experience (SUS) models were considered to apply satisfaction surveys to validate the results. The research results led to generating a five stages method that involves: i) initial contact with the client, ii) requirement definition, iii) Implementation in a test environment, iv) production and v) closure of the implementation project.

Keywords
UDA-ERP, ERP, Lean Thinking, Agile methods, Project Management.

1. Introduction
In Cuenca, Ecuador, a group of research professors from the Universidad del Azuay, developed UDA-ERP software for micro, small and medium-sized enterprises (for its acronym MSMEs) of this city and the whole region to support the planning and managing of business resources. This software focuses on the MSMEs based on the market study carried out by Astudillo et al. (2018), which evaluates the number of companies registered by the business sector, workers, and annual sales volume. Tinoco (2020) notes that in Cuenca city, 73.5% of MSMEs plan to acquire software for business management. Based on the research by Astudillo et al. (2018) for the management and administration of the resources of MSMEs, the UDA-ERP software includes the following modules: i) Manufacturing, ii) Inventories, iii) General accounting, iv) Cost accounting, v) Purchases, vi) Sales and vii) Human Talent. UDA-ERP was developed

in web architecture (Astudillo et al., 2018), which according to Suppiah and Hassan (2016), minimizes the hardware and software requirements necessary for its correct performance.

Nagpal et al. (2015) emphasize that it is essential to consider the implementation or deployment when requiring ERP software since the success or failure of an ERP within an organization depends on this. Likewise, (Kaushik et al., 2015) indicate that 20% of ERP software causes unfavorable reactions in end users due to the disagreements generated in its implementation stages in companies. Research conducted by (Phaphoom et al., 2018) points out the need to resort to an implementation method that guides software deployment activities, as do large ERP software distributors (Elbahri et al., 2019), i) SAP Business ONE with its ASAP implementation method, ii) Microsoft Dynamics with the Sure Step method and iii) Oracle ERP with the OUM method. Maryam et al. (2018) and Phaphoom et al. (2019) state that these implementation methods are designed to guarantee the implementation of their own ERP software. In addition, they do not contemplate the impact generated on end-users, who present a different reaction to the use of software to execute their daily tasks, becoming a key factor during implementation. Additionally, there are other factors to consider, such as the hardware and software in the organizations, the staff level of technological knowledge, and others (Ferreira and Kuniyoshi, 2015).

Kaushik et al.(2015) point out the existence of implementation methods that can be used in the deployment of any ERP software. An example of this is agile methodologies characterized by frequently implementing low-impact changes, which causes the implementation staff to carry out systematic planning (Nagpal et al., 2015). Another example is the Lean Thinking methodology, which aims to remove unnecessary processes and take advantage of existing resources (Kaushik et al., 2015). With the experience obtained by the UDA-ERP software implementation team at the time of software installation and configuration in MSMEs in the region, the need arose for a custom-designed method to guide activities required during this task in each of the organizations. At present, this is carried out empirically, and therefore it is necessary to control and plan it since most software implementations fail by not using any method. This research proposes an implementation method for the UDA-ERP software, which combines Agile and Lean Thinking methodologies.

The objective of this research is to propose a method based on Lean Thinking and agile deployment methods for the implementation of the UDA-ERP software in the MSME context.

2. Literature Review

2.1 Analysis of SMEs in Ecuador

According to the information obtained by the Ecuadorian Institute of Statistics and Censuses (by its acronymous in Spanish, INEC), during the last business census carried out in 2019 (INEC, 2020), micro-enterprises have national participation in sales of 0.91% and small and medium-sized enterprises 26.78%, but these contribute 60.46% of the jobs in Ecuador.

INEC (2020) mentions that in Azuay Province, 592 establishments are registered for every 10,000 inhabitants, concentrating 6.40% of companies in the country and participating in 5.22% in national sales and 5.91% in workplaces, being one of the provinces with the highest density of Ecuador companies. In Cuenca city, the population is characterized by its spirit of improvement and perseverance (Neira Salazar, 2015). Therefore, there are MSMEs in various places in this city, especially the downtown and in an industrial zone.

2.2 Analysis of ERP use in SMEs in Ecuador

The MSMEs of Cuenca city that were part of the study carried out by (Tinoco, 2020), uses different software like an ERP for their administration. However, they resemble the modules that ERP software has. Based on an analysis complemented by this study, the number of MSMEs that use these software modules and their maintenance costs are indicated, concluding that ERP software can be implemented in any MSMEs, reducing system maintenance costs, and increasing the possibilities of growth.

2.3 Most popular ERP

As a starting point for this research, we considered the most popular ERP software, oriented to MSMEs in Latin America, which have their own methodology for their deployment in companies. (Elbahri et al., 2019).

SAP Business One: Developed by IBM, it was marketed in 1994, becoming the first ERP software, with the particularity that it was developed for military purposes. This software has modules for finance, sales, services, purchasing, inventory, production, and project management. These modules are adapted to the needs of SMEs (González et al., 2018). According to Danda (2015), SAP Business ONE uses the ASAP implementation methodology, which is developed under agile guidelines and is composed of five phases: i) project preparation, ii) business plan, iii) implementation, iv) final preparation, and v) entry into production and support. Each phase integrates work packages that detail the activities and tasks that are carried out.

Oracle ERP: Known commercially as Oracle Applications, the Oracle company offers it for enterprise resource planning. Its modules are finance, accounting, human resources, production, supply chain, and project management. It uses several of the products developed by the same company, such as the database manager and the Java programming language (Maldonado, 2015). According to Gutiérrez Diez et al. (2013) and Nagpal et al. (2015), the implementation of Oracle ERP is guided by the Oracle Unified Method (OUM), formerly known as Applications Implementation Methodology (AIM), composed of five phases: i) start, ii) elaboration, iii) construction, iv) transition and v) production.

Microsoft Dynamics: Developed by Microsoft, it is an ERP software designed for SMEs; its basic modules support the activities of finance, supply chain, and electronic commerce, among others. It is adaptable to the specific needs of each company by the licensing type for its distribution, which allows each client to transform the source code. End-users of ERP software are assigned roles that define tasks and permissions in the application. Microsoft Dynamics uses its own implementation method called Sure Step (Microsoft, 2019), developed in 2007, and includes six phases: i) diagnosis, ii) analysis, iii) design, iv) development, v) implementation, and vi) operation. In addition, Microsoft staff also contribute to the planning of the software and the counseling in the sales process (Gutiérrez Diez et al., 2013) and (Joseph, 2017).

The implementation methodologies proposed by large companies focus exclusively on the activities to be carried out at this stage. However, it is also essential to consider various factors that may affect the implementation of the ERP software, such as the end-users interaction, the amount of time they have been doing a job, or their seniority in the company. (Phaphoom et al., 2018). To (Maryam et al., 2018) and (Phaphoom et al., 2019), several existing factors must be considered when implementing software. Ferreira and Kuniyoshi (2015) identified eight groups of factors: i) organizational strategy and culture, ii) support from senior management, iii) qualified users and team involved in implementation, iv) hardware and software infrastructure, v) customer-relationship supplier, vi) project execution management, vii) external consultants and viii) change management in the business process.

2.4 Agile Methodologies

Agile Methodologies are a set of methods that allow the iterative and incremental development of the software, giving rise to the insertion of new requirements, evolving throughout the project according to the needs of the user. Allows work to be shared in a balanced way through the organization of multidisciplinary workgroups that plan decision-making in a short time (Marino, 2017).

XP: They are also known as Extreme Programming. It is the first Agile Method to focus directly on establishing detailed development practices such as test-based development and pair programming. The early success of XP can be explained by its orientation toward a set of practices development. Adopting it early in a project can be simple, as it provides clear rules. However, for people who join the project in later phases, these rules might not make sense in their context, and therefore they would appeal to more flexible agile methods. (Rodríguez et al., 2018).

Scrum: It is a method in which applied good practices to work as a team and obtain the best possible result from a project. Made are partial and regular deliveries of the final product, prioritized by the benefit they bring to the project receptor. Scrum has indicated that for projects in complex environments in which, it is necessary to obtain results as soon as possible, where the requirements are changing or poorly defined. Also used to resolve situations in which the customer does not receive what he needs, deliveries are considerably prolonged, increased costs, or the quality of the software meets minimum quality guidelines (Rodríguez et al., 2018).

The description of Agile Methodologies was born within software development; however, its application has increased in the deployment phase. Such is the case of Scrum, which is a method adaptable to any project (software development

or deployment); used in several of the implementation methods recommended by the previously mentioned ERP software providers (Nagpal et al. 2015).

2.5 Lean Thinking

The Lean Thinking method originates in the Lean production methodology, whose main objective is to reduce waste and costs to increase added value. Waste terms include activities or processes that consume resources but do not add value to the customer, optimizing these activities to obtain the most significant benefit (Kaushik et al., 2015). It was introduced in 1940 during the Second World War by Japanese companies to overcome the obstacles in the production processes of large batches of products (Caldera et al. 2017).

2.6 Lean Tools Applicable to Software

There are several software-oriented Lean tools; among the most used are the following:

- **Kanban** is the method based on signal creation to implement the extraction principle by signaling the stages and production tasks (Ahmad et al., 2018).
- **Kaizen** is a continuous improvement process by applying small changes in short time intervals (Estacio et al., 2014).
- **JIT** is a system to produces the necessary at the right time in the right quantities (Tian et al., 2020).
- **Jidoka** is a principle of quality control whose objective is to provide the ability to stop work immediately whenever a problem or defect is detected. This leads to process improvements by removing the hassles in the bud (Mousaei and Javdani Gandomani, 2020).

Of the Lean tools mentioned, the use of Kanban stands out due to the evident improvement process of up to 130% in the deployment of software in companies, which has generated a growth in popularity within software development teams (Tripp et al., 2018). Initially, it was applied within a set context to visualize work and ensure that all work has value. Kanban, however, has been classified as a process support tool by minimizing work, allowing the team to adapt and define new tasks quickly and easily according to their needs (Tripp et al., 2018).

2.7 Factors that affect the implementation of ERP software

Most implementation methodologies focus only on the activities to be fulfilled during the ERP software implementation. But in reality, an impact is generated on the end-user because each of them has a different reaction to software use, by the years they have been doing a job or by the time they have been in the company, being them a critical factor in ERP implementation (Phaphoom et al., 2018). Beyond the methodology applied, several factors interfere during an ERP implementation, which is considered when selecting or creating the implementation method (Maryam et al., 2018) and (Phaphoom et al., 2019). According to Ferreira and Kuniyoshi (2015), eight groups of crucial factors have been identified in ERP software implementation, which internally contains 20 factors that interfere with this process. These factors are: i) Organizational strategy and culture, ii) Support from senior management, iii) Qualified users and team involved in implementation, iv) Hardware and Software Infrastructure, v) Customer-Provider Relationship, vi) Project execution management, vii) External consultants and viii) Management of changes in the business process.

3. Methods

It starts from the ASAP, Sure-Step, and OUM methodologies, which cover most of the areas of interest during the software implementation, summarized in table 1.

Table 1. Phases and activities of the ERP Software implementation processes (Joseph, 2017) and (Nagpal et al., 2015).

ASAP	Sure step	OUM
Project preparation • Project planning. • Identification of objectives. • Technical requirements. • Work teams' formation	**Diagnosis** • Create and maintain the relationship with the client. • Provide support during the presale. • Run decision accelerators.	**Start** • Define the scope of the project. • Create work environments. • Confirm resources. • Develop a work plan.

• Project scope delimitation.	• Complete the statement of work (SOW).	• Develop the financial plan for the project.
Business Plan • Creation of the business plan. • Definition of organizational structure. • Analyze and define business processes. • Quality control.	**Analysis** • Finalize the project plan. • Define the work team to collect functional requirements. • Execute a system planning analysis (GAP). • Develop a test plan.	**Elaboration** • Deliver a complete tutorial of the system. • Develop business process models. • Develop security models. • Develop integration schemes.
Realization • Baseline configuration. • System management. • Final configuration and confirmation. • Develop programs, interfaces, Etc. • Final integration test. • Quality control.	**Design** • Train the work team. • Develop Functional Development Documents (FDD) to customize the software. • Trial version.	**Building** • Execute conversion. • Create integrations. • Develop test scripts.
Final Preparation • System management • Detailed project planning. • Cut. • Quality Control.	**Developing** • Configure solution. • Carry out process tests. • Perform integration tests. • Manage scope and solve problems. • Complete the solution design documentation.	**Transition** • Train the end user. • Run software tests. • Create the production environment. • Execute cut for production output.
Production entry • Migration to the production environment. • Production support. • Surveillance. • Performance optimization.	**Deployment** • Completion of Train the Trainer (TTT) training. • Manage training on the use of the software. • Perform user acceptance tests. • Preparation of activities for production output.	**Production** • Define the maintenance contract.
	Operation • System in production. • Post-production support.	

From what is stated by (Joseph, 2017) and (Nagpal et al., 2015)**,** similar activities have been selected among the methodologies mentioned above, obtaining the necessary basic processes that a software implementation methodology must contemplate, identified by phases are detailed below.

Phase 1: i) Project planning, ii) Objectives Identification, iii) Requirements Survey, iv) Work teams formation, v) Project scope delimitation, vi) Creating and maintaining the relationship with the client; **Phase 2:** vii) Analysis and definition of business processes, viii) Define work teams, ix) Develop integration models; **Phase 3:** x) Solution configuration, xi) Run test scripts, xii) Run software tests, xiii) Integration tests; **Phase 4:** xiv) Quality control, xv) Perform user acceptance tests, xvi) Prepare activities for production, xvii) Enable the production environment; **Phase 5:** xviii) Migration to production, xix) Post-production support.

The proposed methodology includes five phases, in which the current state of the organization is known, and work teams are organized in charge of ERP software deployment to provide follow-up to four tasks identified: i) requirements analysis, ii) preparation of the project plan, iii) implementation of the plan, and iv) post-production technical support. These tasks are developed during the five phases, considering various factors that affect the software implementation, and adapted to the reality of the MSMEs in Cuenca city.

The agile methodology for deploying the proposed implementation method is SCRUM due to its flexibility in carrying out various activities that contribute to short-term progress (knew as sprints) (Nagpal et al., 2015). Each implementation method phase is considered a sprint within SCRUM. Additionally, for the definition of each of them, the proposed variables by Phaphoom et al. (2018). Likewise, the application of the Lean methodology is proposed through the Kanban tool because, according to (Danda, 2015), it adapts in a versatile way to software projects, improving implementation processes by 125%. As a result of applying the tool in research, Kanban boards were generated in each phase of the proposed method to execute control of tasks or change their status. Additionally, the McKinsey 7S was used to visualize the organization's current state in the first software implementation phase (Hanafizadeh and Ravasan, 2011). Otherwise, the Lean tool called Andon allows for the status identification of the processes through a control system based on colors (Renato and José, 2017). As a complement, the documentation of each of the phases of the ERP software implementation process will be based on the templates of the CMMI version 1.7 model to obtain complete information and order (Palomino et al., 2017).

Surveys

With the objective of the proposed method analysis, the SERVQUAL surveys were applied to MSME staff who participated in the implementation processes, and SUS surveys were applied to the UDA-ERP software implementation team. SERVQUAL surveys are based on the service quality model; they contemplate the most important service quality dimensions, as mentioned in Cajamarca and Guananga (nd). The SUS surveys analyze usability to obtain the perception of the proposed method and evaluate if it offers better control over the software implementation activities (Danda, 2015). The surveys were applied in two study settings for all participants. The SERVQUAL questionnaire was applied to two employees of the MSME participating in the case study, while the SUS questionnaire was applied to two members of the software implementation team.

4. Data Collection

To obtain the details of the method currently used for the UDA-ERP software deployment, several interviews were conducted with the implementation team, and the activities carried out during a general software deployment process in the MSMEs of the sector were identified.

1. **Feasibility analysis**: review the company's current state, its processes, staff, organization, the scope of the project, Etc. If, after the analysis, it is determined that the company meets the minimum requirements for implementation, it is documented: Project constitution document, specific agreement, and confidentiality agreement.
2. **Project planning**: defines the modules to be implemented, the resources involved by the organization, and the UDA-ERP team. Also, is identified the initial company information.
3. **Design**: analyzes the modules, functionalities, configurations, security, and number of users, so that they can be parameterized the system according to these criteria. Upon completion of this phase, is obtained a detailed implementation schedule.
4. **Implementation**: corresponds to the application configuration and installation within the organization. A test plan is executed in conjunction with those responsible for the organizations.
5. **Training**: according to the organization's size, a training plan is established and executed on the installed functionalities.
6. **Start-up and closure**: the application goes into production and is formalized for project completion.

From the information obtained, it has been empirically contrasted with the summary of the ASAP, Sure-Step, and OUM methodologies detailed above. As a result, we obtained the implementation method proposed in the present investigation.

5. Results and Discussion

The proposed method includes 5 phases, described below:

PHASE 1 - Initial contact with the client

The purpose is to identify the objectives and needs of the organization clearly to determine the scope of the project. The support from the management (sponsors) is formalized, preparing, and approving the project initiation document.

PHASE 2 – Requirements definition
In this stage, the organization's requirements are detailed, business processes are analyzed, and the feasibility of being automated with ERP software is validated. In addition, the project plan is designed in which the requirements (SRS) and necessary resources are documented. Likewise, the implementation team is trained with the collected data.

PHASE 3 - Implementation in a test environment
Starts the implementation of the software in a test environment to adapt and customize the ERP software according to the needs identified in the previous phases. An important activity is to collect initial base data from the organization to software configure, which expert users must review and approve and execute functional software tests to identify problems that the implementation team should mitigate. The team periodically assesses the progress of the ERP software implementation according to the project plan.

PHASE 4 - Production
The tasks of this phase are: i) migrate the organization database to configure the production environment, ii) train the end-user on the ERP software use, and iii) execute and formalize the approval for the software testing plan. If any situation is identified, it must be managed by the implementation team until the version validated by the organization is obtained. Consequently, the final version of the software will be obtained.

PHASE 5 - Closure of the project implementation
The ERP software implementation ends. The delivery reception of software is formalized with the organization through a document in which the project deliverables are detailed. These deliverables comprise the documentation obtained in each of the phases.

5.1 Validation
The activities currently carried out for the UDA-ERP software deployment are contrasted with the activities integrated into the proposed implementation method, as shown in table 2.

Table 2. Validation of current method vs. proposed method

Current Method	Proposed method
Feasibility analysis • Review of the current state of the company. • Analysis of Processes, Staff, and Project Scope	**Initial contact with the client** • Identify the implementation modules. • Analyze the current functioning of the organization in each module. • Define objectives. • Define the project scope. • Evaluate the hardware and software resources existing in the organization. • Formalize management support.
Project planning • Identification of implementation modules. • Identification of necessary resources. **Design** • Analysis of modules, staff, and users. • Definition of basic initial parameterization.	**Requirements definition** • Development of the project plan. • Appoint the project manager by the supplier and the organization. • Formal documentation of requirements. • Documentation of activities. • Estimation of the schedule of activities. • Identify the expert user and the business processes of each module. • Document the processes that will be automated, and which ones will not. • Socialize the information collected with the implementation team.
Implementation • System installation and configuration. • Execution of test plan.	**Implementation in the test environment** • Beginning of the implementation of each module. • Adapt and customize each module. • Obtain and parameterize the initial basic information of the organization

	• Verify the progress towards the established scope.
Training • Training of the organization's staff for the use of the software.	**Production** • Information migration from the test environment to production. • Execute the test plan for each module. • Document the results of the tests. • Train the end-user of each module. • Obtain the final version of ERP software.
Start-up and closure • Completion of tests and output to production.	**Implementation project closure** • Formalize the delivery - reception of the software with the organization

5.2 Collection of SERVQUAL questionnaires

The results are analyzed in each section of the SERVQUAL questionnaire illustrated in table 3, and on a scale of 1 to 3, considering that 1 = "bad", 2 = "good" and 3 = "excellent". The final grade is obtained from the sum of the selected score for each question. The following formula calculates the result:

$$C_i = A_i - B_i \quad (1)$$

- i, is the section number.
- A_i is the score obtained in each section of the second scenario.
- B_i is the score obtained in each section of the first scenario.
- C_i it is the result of the subtractions of each scenario.
    - If $C_i \geq 0$, the customer perceives a higher quality of service in the second scenario.
    - If $C_i < 0$, the customer perceives a higher quality of service in the first scenario.

The method of evaluating the results described by (Kumar and Hundal, 2019); (Raza et al., 2020), and (WANG et al., 2015) was adapted to the requirements of this study to evaluate the information collected.

Table 2.SERVQUAL results applied to SME staff.

	Results			
	Employee 1		**Employee 2**	
Question No.	**SS 1**	**SS 2**	**SS 1**	**SS 2**
The activities planned to be carried out each time are fully accomplished.	2	3	2	3
When there is a problem, they show interest in solving it.	2	3	3	3
Show good service performance from the first moment.	2	3	2	3
Provides its services when it promises to do so.	1	2	2	3
Maintains error-free registers during the implementation stage.	2	2	2	2
Total Reliability Section	**9**	**14**	**11**	**14**
Maintains a follow-up record to clients and informs in a timely manner of the moment in which the requirements will be executed.	2	3	1	2
Provide timely service.	2	3	2	2
Ready to always help.	2	2	2	2
Never too busy to attend to requirements.	2	3	2	2
Total Section Responsiveness	**8**	**11**	**7**	**8**
The behavior performed instills confidence.	2	3	2	2
Feel safe in the activities carried out.	3	3	1	2

Courteous always.	3	3	2	3
Enough knowledge to answer questions.	3	3	2	3
Total Security Section	**11**	**12**	**7**	**10**
Provide individualized attention.	1	2	2	3
Enough staff to provide attention to each of the clients.	1	2	1	2
Concerned about improving business interests.	2	2	2	3
Understand specific needs.	2	2	2	2
Convenient hours of operation.	1	2	1	2
Total Empathy Section	**7**	**10**	**8**	**12**
UDA ERP software has the appearance of being technologically advanced.	1	2	1	2
The UDA ERP work team maintains a good presence.	2	2	2	2
The screens of the UDA ERP software are visually appealing.	2	2	2	2
The material associated with the service and the product delivered by the members of the UDA ERP is understandable	1	2	1	2
Total Section Tangible Elements	**6**	**8**	**6**	**8**

* SS means score on stage.

The scores by section and analysis scenario are detailed in table 4, displaying the average score of the surveyed employees.

Table 3. SERVQUAL averages by section and employee surveyed

Section	Average Scenario 1 (B)	Average Scenario 2 (A)	C = A - B
Reliability	10	14	4
Answer's capacity	7.5	9.5	2
Safety	9	11	2
Empathy	7.5	11	3.5
Tangible Elements	6	8	2

Applying formula (1), in the second scenario, a more excellent perception of the service quality of the UDA-ERP team is obtained during the software implementation in the SME. As demonstrated in table 4, when calculating the values for C, which are greater than 0 in all sections, it can be concluded that the proposed method increases the quality of customer service during the software deployment.

5.3 SUS questionnaires collection

The evaluation scale of these questionnaires is between 1 and 5, considering that one is "Dissatisfied" and five is "Very Satisfied." The results will be analyzed as follows: for questions 1, 3, 5, 7, and 9, 1 will be subtracted from the selected score, and for questions 2, 4, 6, 8, and 10, the selected score will be subtracted from 5. The sum of these values is multiplied by 2.5, obtaining a result of 0 to 100 on the SUS scale (Danda, 2015). (Danda, 2015).

Table 5 summarizes the result of the software deployment applied to the implementation team with the current method and proposed method. For the first scenario, the SUS score obtained was 48.75 points, and in the second scenario, it was 66.25 points.

Table 4. SUS results applied to the implementation team with the current method and with the proposed method

	Current method results				Proposed method results			
	Imp. 1		Imp. 2		Imp. 1		Imp. 1	
Question No.	**S.**	**SSUS**	**S.**	**SSUS**	**S.**	**SSUS**	**S.**	**SSUS**
1. I think I would use the implementation method frequently:	4	3	2	1	5	4	4	3
2. I find the deployment method unnecessarily complex:	3	2	3	2	4	1	3	2
3. I think the implementation method was easy to use:	3	2	3	2	4	3	4	3
4. I think you would need help from a person with technical knowledge to use the deployment method.	4	1	4	1	2	3	3	2
5. The functions of this implementation method are well integrated.	3	2	4	3	5	4	4	3
6. I think the implementation method has a lot of inconsistencies.	2	3	2	3	1	4	2	3
7. I imagine that most people would learn to use this implementation method very quickly.	4	3	2	1	2	1	3	2
8. I find this implementation method exceedingly difficult to use.	1	4	4	1	1	4	2	3
9. I am comfortable using this implementation method.	2	1	2	1	5	4	4	3
10. I needed to learn a lot of things before I was able to use this implementation method.	2	3	5	0	3	2	3	2
Subtotal		24		15		27		26
Total		24 x 2.5 = 60		15 x 2.5 = 37.5		27 x 2.5 = 67.5		26 x 2.5 = 65

* S = score; SSUS = SUS score; Imp = implementer

6. Conclusion

In the proposed method, the implementation activities planning and their monitoring provided greater control by the ERP software provider company by incorporating activities schedule and a Kanban board to control the status of each one of them. By combining Kanban with Andon, the method got a visual control of the activities and their execution status throughout the ERP software implementation, identifying activities objectively in progress or that still does not start. The activity error rate will be reduced, and the implementation process will continue following the initial planning. The results of the SERVQUAL questionnaire showed that the proposed implementation method offered the client a more excellent perception of the service quality offered by the UDA-ERP software implementation team since it involves the client in each of the deployment stages.

When applying the SUS questionnaire, the usability of the proposed deployment method is evaluated by the UDA-ERP software implementation team, who experienced the benefits of the proposed method compared to the current method.

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