

A Catalog of Best Practices about Supplier Agreement Management and Agile Practices

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Abstract—With the growth of the market related to the software development industry, it is necessary to adopt practices that can assist this area in an agile way. This can enable the management of activities related to software acquisition to be defined more effectively, both for those who provide the system, and for those who acquire it. This paper proposes a catalog of best practices using the agile principles that are included in some methodologies. These are designed to manage the software acquisition process in the organizational context of software development, based on the SAM (Supplier Agreement Management) process area of the CMMI-DEV (Capability Maturity Model Integration for Development). The purpose of this catalog is to support the software organizations in the definition and implementation of their processes that are based on quality improvement programs.

Keywords—*software engineering; software quality; process improvement; acquisition; supplier agreement management; agile practices.*

I. INTRODUCTION

The software is of an abstract and intangible nature, which means that quality software development is a complex and challenging task for software organizations [1].

Some software development organizations are looking for new strategies to address these challenges, such as the acquisition of parts of the products or services offered to customers. This can improve the quality of the process and the end product that will be delivered to them. Another strategy involves the use of Software Process Improvement programs such as the CMMI-DEV model. This provides guidance for the application of best practices of CMMI in a development organization, to help organizations improve their skills in a systematic way and thus meet their deadlines and develop software [2].

Another approach adopted by organizations is the Agile Methodology, which aims to help teams work rapidly and efficiently through short and time-boxed iterations for planning product increments, and speed up the development procedure. This task may be essential for an organization that wishes to stay in the competitive market, when there is a need for continuous improvement in software products so that they can meet the increasing needs of their customers [3]. The adoption of agile practices in software development has occurred in response to the need to produce software of quality, at great speed that satisfies the user's needs. The

software projects often require this speed and productivity to meet the demands and challenges of the market. As a result, the Information Technology (IT) areas have had to invest in quality, monitoring and governance capacity. This task is a real problem in the context of software development and it is essential for companies to achieve quality and agility in their development to meet their deadlines and ensure cost / risk control effectiveness [1]. Other problems may be related to the following: difficulties with the planning team, difficulties in reviewing the product requirements based on traditional models, dissatisfaction of the business area with software development projects, and a low response rate with regards to the development process carried out to meet market demands.

Some experiences with software development might be successful in delivery of the product, owing to the use of an outsourcing strategy. However, organizations are still having problems with the planning, implementation and management of the acquisition process of goods or services from suppliers. This is due to the fact that it is difficult to maintain control of the development process of the quality of the goods and services acquired, which may be caused by poor planning, and thus lead to a delay in delivery and unplanned costs [4].

In another study [11] we performed a Systematic Literature Mapping (SLM) [5]; this was a 'secondary' study based on a review of the evidence contained in primary studies and its purpose was to identify, analyze, interpret and report all the key primary research findings in the study area.

The justification of this study lies in the fact that the management of the Acquisition Process is of great importance to software development organizations and its management, as well as to software maturity models [6]. However, these models specify processes that require more time for implementation, when what is needed to meet the market demands is an acquisition process that is not carried out in a bureaucratic and systematic way, but is flexible, agile and with quality.

The main goal of this work is to develop and evaluate a Catalog of Best Practices based on the concepts of an agile methodology for managing the software acquisition process in the context of software development organizations. This catalog must comply with the guidelines set out by the SAM process area of CMMI-DEV, and are concerned with

agile methodologies. It aims to provide a solution to support organizations that can contribute to agility, make cost reductions and control the time needed to implement the acquisition process.

In addition to this introductory section, this paper is structured in the following way: in Section 2 there will be a review of related works and this will outline the background of this work, Section 3 will describe the catalog of best practices produced by SAM and the agile practices, Section 4 shows the expected results, and Section 5 concludes the work with some final considerations.

II. RELATED WORKS AND BACKGROUND

This section provides an overview of the concepts of the SAM process area in CMMI-DEV and an overview of systematic literature mapping performed in another work, and examines some related works.

A. Supplier Agreement Management Process Area in CMMI-DEV

In this work, the CMMI-DEV is the focal point of the study, since it has a process area that can support the SAM in the acquisition of goods and services in development projects. The CMMI for Development has 22 process areas that have a set of best practices and these address the question of carrying out activities for goods and services development, using practices that cover the lifecycle of the products from their conception to their delivery and maintenance [2], (as shown in Table I). It also a) helps to integrate organizational functions that have traditionally been separated, b) sets out process improvement goals, c) establishes a set of priorities to provide guidance for processes quality, and d) provides a benchmark for the evaluation of current processes [2].

TABLE I. CMMI PROCESS MATURITY LEVELS.

Level	Categories			
	Project Management	Process Management	Engineering	Support
5		Organizational Performance Management		Casual Analysis and Resolution.
4	Quantitative Project Management.	Organizational Process Performance		
3	Integrated Project Management, Risks Management.	Organizational Process Definition, Organizational Process Focus, Organizational Training	Requirements Development, Technical Solution, Product Integration, Verification, Validation.	Decision Analysis and Resolution.
2	Requirements Management, Project Planning, Project Monitoring and Control, Supplier Agreement Management.			Configuration Management, Process and Product Quality Assurance, Measurements and Analysis.
1	Process ad hoc.			

The purpose of the SAM process area is to manage the acquisition of goods and services from suppliers [2]. The scope of the SAM process area covers the acquisition of

products, services and goods and services components that can be delivered to the customer or included in a product or service system [2]. This area involves the following specific practices: determining the type of acquisition, selecting suppliers, drafting supplier agreements, fulfilling the supplier agreement, accepting the acquired products, and ensuring the delivery of the goods.

B. An Overview of a Systematic Literature Mapping

In another study [11], a SLM was performed through a research partnership between students and lecturers at the Federal University of Pará and University of Pernambuco. The aim of this was to identify key data on how the software acquisition process could be combined with agile methodologies. This stage showed that there are gaps in this area since the SAM process area was carried out by means of agile practices in the software development environment, and also showed the significance of the study undertaken in this paper.

The selection of the studies followed several phases and the work was carried out by two or more researchers to reduce the risk of bias in the selection [5]. The complete research protocol is available in [11]. This research was performed in four phases; it was conducted by two researchers and three reviewers.

Phase 1 consisted of a) an automatic search to access the sources and execute a string to locate the relevant studies in accordance with the criteria defined in the protocol, and b) a manual search to access the conference and download all the studies related to the research topic.

In Phase 2, each study selected in the previous phase was analyzed by two researchers, based on the analysis of the title and abstract. Any duplicate studies were discarded together with those that were clearly irrelevant to the search according to the inclusion and exclusion criteria.

In Phase 3, list of Phase 2 was consolidated and all these studies were evaluated by two researchers who applied the inclusion and exclusion criteria, through a complete reading. If there were conflicts of opinion between the researchers, a meeting was held to reach a consensus, and if the disagreement persisted, the matter was solved by the reviewer.

On the basis of the consolidated list of Phase 3, a quality assessment was conducted in Phase 4 together with a data extraction of all the studies from a complete reading of the studies. The studies were analyzed by two researchers to evaluate the quality, through the application of quality criteria. The data extraction was performed by two researchers and the results were documented in a form, and the extraction review was conducted by the reviewers.

Fig. 1 summarizes the phases and the number of identified studies from each SLM phase. Before the selection, a meeting was held to clarify the concepts and discussions about the inclusion and exclusion criteria, so that the concepts were understood by all the participants.

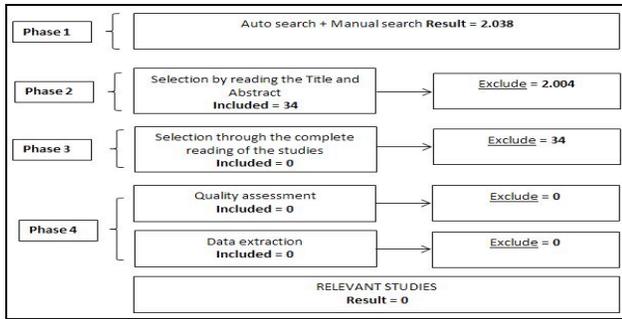


Figure 1. The study selection process

The findings suggest that there is a lack of research on the subject, due to the fact that no relevant data have been disclosed about how the SAM process area of CMMI-DEV can be combined with agile methodologies. In view of this, this result confirms that there is a gap in knowledge about the investigated area, which confirms the relevance, feasibility and innovativeness of this research study.

C. Related Works

The related works to this research were considered to be relevant if they addressed the following issues: (1) the need to support the systematic implementation of maturity models, (2) the study of software acquisition, (3) the use of agile methodologies in the context of software development, (4) the use of agile methodologies in the context of software process improvement. Some studies relating to the topics mentioned are described below.

Furtado's research study [7] supports the systematic implementation of maturity models, and carried out a task based on process improvement models and standards. This work defined a proposal for the acquisition process by means of a process framework and a tool to support the implementation and execution of the process for acquiring software and related services. On the basis of this framework, this paper confirmed the compatibility of the activities that compose it, with regard to the SAM process area of CMMI-DEV. Thus, it was able to determine which of its activities can be mapped to the agile practices, so as to define the catalog of best practices proposed in this paper.

With regards to the research studies on software acquisition, an approach was adopted to define the processes required for the acquisition. These included different contexts, and defined a software acquisition process to enable the reuse of process components in the definition and implementation of acquisition processes, and support the organizations that implement the software acquisition more efficiently. However, this work did not include the agile concepts in its approach [8].

A related work about the use of agile methodologies in software development, showed some of the advantages of agile methodologies of software compared with traditional methods. This study discussed the main features and practices of agile methodologies, and made comparisons with traditional methodologies, by emphasizing that agile methodologies are based on people rather than processes and planning [9]. However, it was restricted to show the

advantages and disadvantages of eXtreme Programming (XP) and Scrum, without focusing on the acquisition procedure.

Another study [10] analyzed quantitative and qualitative data collected from the literature and two Brazilian organizations that employed the XP agile methodology. The main contribution of this work is that it identified features from the Agile and CMMI association and the implications of this application.

As a result, this methodology gave an account of fusion that was incomplete, since it was found that there are only a few quantitative reports. These were insufficient either to provide a definitive opinion about this "incomplete" fusion or to define in which cases the fusion would generate better results. It should be noted that the research was confined to dealing with an agile methodology - XP.

From the analysis of the works above, it is clear that the acquisition process implemented in an agile way was not within the scope of these projects. As a differential, this study will provide an implementation of the main agile approaches with regard to the framework [7] that are compatible with the SAM process area of CMMI-DEV, and provide the necessary basis for setting up the Catalog of Best Practices by employing agile methodologies to support the acquisition process in the context of software development organizations.

III. THE CATALOG OF BEST PRACTICES FOR SAM AND AGILE PRACTICES

The first mapping was carried out within the framework presented in [7], which included the SAM practices, and the second mapping of activities resulted from the first one that had agile methodologies (XP, Scrum and Feature Driven Development (FDD)). This provided evidence that the application of agile practices can be used in the context of a software acquisition procedure. This document was prepared as follows: all the activities, which are in the framework phases, were related to the SAM practices that resulted from each activity and confirmed the level of agile practice that was needed to assist in the implementation of the procedure.

On the basis of the obtained results from the previous mapping, a catalog of practices was recommended, which included the suggestions for agile practices that can be implemented in activities performed in a traditional software development organization. When evaluating the catalog, the experts in the area of Software Quality used a peer review technique to determine the effectiveness of the agile practices with regards to the proposed acquisition procedure.

A. The Agile SAM Workflow

The activities included in the catalog were identified by aligning the framework activities of the software and related service acquisition processes [7] with the SAM process area of CMMI-DEV [2]. In this way the research was able to identify the best practices defined for the software acquisition process that can support organizations to form acquisition agreements based on agile practices.

The catalog comprises of 4 activities: (1) Preparing the

Acquisition, (2) Selecting the Supplier, (3) Monitoring Acquisition, and (4) Accepting the Acquired Product. The macro workflow can be seen in Fig. 2.

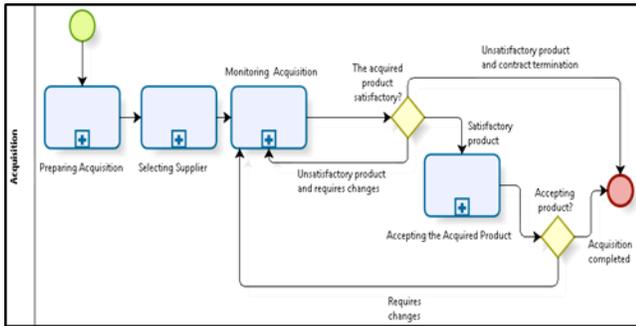


Figure 2. The Agile SAM Macro Workflow

In the first activity, Preparing the Acquisition, the activities about acquisition planning are carried out and include the following: establishing the needs and desired outcomes, setting out the project stakeholders, defining and prioritizing the stakeholders’ requirements, reviewing the requirements, conducting a technical feasibility analysis, developing an acquisition strategy, defining and agreeing on the acquisition schedule, defining the criteria for the product acceptance, setting out the criteria for supplier selection, preparing and approving the acquisition plan, and identifying the potential suppliers.

The aim of the second activity, Selecting the Supplier, is to identify and select the supplier that meets the expectations of the acquisition. This consists of the following 7 activities: receiving the proposals, giving an operational opinion, providing a technical opinion, selecting the supplier, preparing and negotiating an agreement, ensuring the agreement terms are fully understood, and drawing up the agreement.

During the third activity, Monitoring Acquisition, the control and monitoring of the acquisition are performed. This includes the following activities: reviewing the agreement terms, agreeing to the changes, tracking issues, and monitoring the supplier processes. In this activity the question of whether the product being developed is satisfactory or not is determined. If it is unsatisfactory, there are two alternatives for the customer that have to be evaluated: implementing the necessary changes or terminating the agreement; this finalizes the acquisition process. But if the product is satisfactory the activity is carried out.

In the fourth activity, Accepting the Acquired Product, it is determined if the product can be accepted by the customer. The following activities are carried out: evaluating the product delivered by the acquisition, complying with the agreement, and accepting the product. During this activity, it is still necessary to confirm if the product will be accepted, because when necessary, it is susceptible to change. However, if no inconsistencies are found, the acquisition is completed together with the acceptance of the product.

B. The Catalog of Agile Best Practices

The catalog of agile best practices was developed on the basis of the results obtained by mapping the 4 activities identified and the agile practices that can be used in these activities. This was achieved by determining if the use of the agile practices was compatible with all the activities present in the macro workflow, and a total of 25 activities were required for the acquisition procedures. Some of the agile practices that may be used in each activity of the catalog are outlined in the subsection below.

1) Activity 1: Preparing the Acquisition

In this activity eleven tasks have been described for the implementation of the guidelines for the agile practices.

Before the ‘Establishment of the Needs and Intended Results’ task can be carried out, a meeting must be held to discuss the needs and desired outcomes from the acquisition, and to compile a Product Backlog with the list of required features. At this meeting, questions will be raised about the reasons for the acquisition and what requirements and restrictions there are of the product that will be purchased. By employing the Scrum agile methodology, the Product Backlog will be prepared and this contains the specifications of the items needed for the product, as well as a description of them. This backlog will be displayed in CANVAS for the benefit of the team involved.

In ‘Setting out the Project for the Stakeholders’, a meeting will be to define the Project to the stakeholders. The following items will be determined to identify the stakeholder, during the meeting: Who are the people that can affect the project? What is the responsibility of the project? How can each stakeholder help (positive factor) and adversely affect (negative factor) the acquisition? What are the degrees of influence of each stakeholder? This information is required to fill the Stakeholders Definition CANVAS.

In the ‘Defining and Prioritizing the Stakeholder Requirements’ task, a meeting should be held to define the order of priority of the items that form the Product Backlog, which is compiled during the ‘Establishment of the Needs and Intended Results’ task. In this case, the following information will be added to the Backlog: a column called “Priority Value”, the aim of which aims is identify the priority according to the degree of its importance to the project in the range of 1 to 10. These values can be classified as follows, 1-3 Low Priority, 4-6 Average Priority and 7-10 High Priority. There is another column called “Priority Level” that shows the degree of priority of each item. This forms the backlog that can be defined, since it is represented in an incremental way, “1” being the most representative item (High Priority) within a project. In this way, it is possible to identify the features that require most attention.

In ‘Revising the Requirements’, after the requirements for the acquisition have been defined, an attempt should be made to check if all the items listed in the Backlog are in accordance with the stakeholders needs and establish if

there are any inconsistencies and conflicts that affect the cost-effectiveness of each item. This activity is based on the Scrum agile practice called Sprint Review, which should be carried out in each cycle by the supplier. It is a means of determining if the purchaser's needs are actually being met and what changes may be required when necessary. The information will be displayed in CANVAS by Checklist. The details of each Backlog item must be put on a card, which will consist of a single identification (ID), item name and its description. The ID is important because it is used during the review of each item, since if any inconsistency is found, this identification will be used in an "inconsistency" card representing the revised item, the description of the problem identified and the change required to correct the problem. If no problem is identified in the Backlog item, it will be marked as Checked (√).

In 'Performing the Technical Feasibility Analysis', a meeting should be held to check the technical feasibility and preparation of CANVAS. Thus, the following questions must be checked:

- Is the solution or the proposed technology practical?
- Does it already have the necessary technology?
- Does it already have the necessary technical knowledge?
- Is the schedule reasonable?

These questions will be analyzed in the light of the available resources, existing restrictions for the project and the quality and the time required for the Project. Feedback must be given for each question.

In the 'Developing a Procurement Strategy' task, a meeting will be held to develop an acquisition strategy based on the results obtained in 'Performing the Technical Feasibility Analysis' task. This is because these results provide the necessary support for planning a consistent strategy with the acquisition needs, that takes account of the viable alternatives, risk analysis, costs and benefits of each option. The results of this task will be displayed in CANVAS, which specifies the acquisition strategy that will be adopted.

In the 'Defining the Acquisition Schedule' task, the reviewed points of the acquisition will be defined and monitored. This meeting should define the day of the month in which these revisions will be made. The times of the daily and / or weekly meetings will also be set, since they are important for checking the activities and the progress made in the proposed acquisition, in all its phases. These dates should be defined and agreed among the stakeholders. Thus, a schedule with the acquisition activities should be generated, which will be displayed together with the specifications for the activities in Kanban (Work CANVAS), which is responsible for implementing the scheme and setting dates for its achievement. Each completed activity is given a Checked (√) to show that it has been implemented.

In 'Defining the Accepted Criteria for the Purchased Product', a meeting will be held to examine these criteria. This involves drawing up a list of project tasks and work products that must be delivered at the end of this project. These should include a 'Checklist for Product Acceptance'

with the specifications required for the product that need to be met.

In 'Defining the Supplier Selection Criteria', a planned meeting should be held to choose the criteria that will be used for the supplier selection process. This meeting will comprise those responsible for acquisition management, and will discuss the relevant criteria to be considered when choosing a supplier, such as budgeting, preparing a schedule for product development, the necessary knowledge for carrying out the project and experience in previous projects. A Supplier Selection Checklist should be generated.

The 'Preparation and Approval of the Acquisition Plan' task, should make use of some of the work products generated in other tasks, such as the schedule, the Supplier Selection Checklist, and the Product Acceptance Checklist. A list of the products that need to be supplied should also be prepared, as well as a definition of the stakeholders' responsibilities for the acquisition procedure. On the basis of this information, the plan will be prepared that specifies the best way to proceed with the acquisition. This plan will be sent to the Work CANVAS so that the stakeholders are informed.

In the 'Identifying the Potential Suppliers' task, a survey will be initially made conducted of the information about the suppliers, such as the criteria listed in the Work CANVAS, which makes it easy for stakeholders to view the list of suppliers that have been analyzed in this activity. Thus, the most suitable suppliers for the project will be identified. Each feature will have an identification, and this ID will be used as a reference-point to show which suppliers that meet each of these requirements. In the last column the suppliers that come closest to meeting the required criteria will be defined, and thus become the potential suppliers.

2) Activity 2: Selecting the Supplier

In this activity, seven tasks have been described below, together with the implementation guidelines based on agile principles and practices.

In 'Receiving Proposals', the suppliers proposals will be forwarded to the person responsible for the acquisition project, who will evaluate its contents, on the basis of the criteria for the potential suppliers. These include the specifications of the "unserved criteria", providing the suppliers with better proposals and displaying them in the Work CANVAS the Suppliers Proposals List.

In the 'Issuing the Operational Opinion' task, a meeting will be held that includes the acquisition management team. The purpose of this is to conduct an analysis of the proposal by comparing the different features of the suppliers and to establish if its proposed solution will actually work. The feedback will be provided by the PIECES Operational Assessment Framework, i.e. it will take account of Performance, Information, Economy, Control, Efficiency and Services. These are checked as follows:

- Performance: Does the current operation mode provide suitable throughput and response time?

- Information: Does the current operation mode provide the end user and managers with accurate, useful, relevant and timely information?
- Economy: Does the current operation mode offer information services that are cost effective for the organization?
- Control: Does the current operation mode provide efficient control services to prevent fraud and to ensure the accuracy and security of the data and information?
- Efficiency: Does the current operation mode make maximum use of available resources? and
- Services: Does the current operation mode provide a reliable service? Is it flexible and extensible?

The 'Issuing Technical Feedback' task will take place after the previous task and will involve an analysis of questions related to supplier features with regard to the availability of technical resources and the necessary professionals to implement the proposal.

The 'Selecting Supplier' task will be carried out by the team responsible for the product acquisition and is concerned with discussing the features of the suppliers that have already been identified and revealed in the operational and technical feedback. On the basis of this information, the team selects the most advantageous proposal that meets the specifications of the required product. A Supplier Analysis and Selection CANVAS will evaluate proposals, together with the specification of the selected supplier and the rationale for selecting or not selecting each supplier. After this, a notification about the acceptance of the selected proposal will be made.

In 'Preparing and Negotiating a Agreement', a meeting will be arranged for those responsible for the acquisition management and the supplier. This task involves holding a discussion about the agreement terms, expectations and obligations of those involved (the purchaser and supplier), and addressing questions about: costs, the schedule, items to be reviewed and the monitoring to be performed, etc. A list should be drawn up of the main terms to be agreed among those involved.

In the 'Ensuring the Agreement Terms are Fully Understood' task, all the agreement terms will be checked. This is to ensure, that they are understood by all those involved in the acquisition. If there is any question or suggestion about the agreement items, these will be discussed and analyzed, and any necessary measures taken for entry, modification or deletion of the term. At the end of the meeting everyone should be aware of what is expected to be agreed. A checklist of items that will be carried out should be prepared, as well as the agreement and the justification for the inclusion or not of the agreement items.

In the 'Issuing the Agreement' task, which is undertaken on the completion of the previous task, the provisions that will form the agreement will have been defined and agreed. Thus, the agreement will be issued at a meeting that will be attended by the acquirer and the supplier who are selected as the people responsible for issuing and signing the agreement.

3) Activity 3: Monitoring Acquisition

In this activity four tasks have been described below, together with the implementation guidelines based on the agile principles and practices.

The 'Reviewing the Agreement Terms' task will be carried out by those responsible for acquisition management and the suppliers and involves checking all the items contained in the Agreement. An analysis will be conducted to determine which are relevant and if there any inconsistencies, and decisions will be made about the necessary changes. Thus, a CANVAS should include the list of agreement terms with a checklist of possible changes, the proper justification for the amendment of items and / or the inclusion of agreement terms.

The 'Agreeing the Changes' task requires a meeting that will be attended by the acquisition management team and the supplier for analysis of the changes identified in the previous task. Thus, a changed card is required and the inclusion of the change information in the agreement must duly agree among those involved.

The 'Tracking the Problems', will be attended by the acquisition management team and involves discussing the problems found and the proposed solutions for each situation. Thus, a problem tracking CANVAS should be generated, which will have TO DO, DOING and DONE status. This CANVAS consists of the following: the project activities and the identification of problems found in each of these activities, a proposed solution, the names of those responsible for each solution, and the starting date and completion date of the corrections made.

In the 'Monitoring the Supplier Process' task, a meeting will be held that will be attended by the acquisition management team and the supplier. The aim of this is to determine what processes are used by the supplier, to check whether the supplier is able to meet expectations of the acquirer or if it is carrying out its activities in accordance with the agreement. Thus, a Checklist about the analysis of processes performed by the supplier should be generated, based on criteria for monitoring the execution of processes.

4) Activity 4: Accepting the Acquired Product

In this activity three tasks are described below, together with the implementation guidelines using the agile principles and practices.

The 'Evaluating the Product Delivered' task involves evaluating the product by taking account of the product acceptance criteria. This will be carried out by the acquisition team and the supplier, so that the supplier is provided with knowledge of any inconsistencies or problems found in the product. Thus, a CANVAS with a checklist of acceptance criteria for a product (that includes functional and non-functional requirements), is given the status of "Attended" or "Not Attended", together with a) the justification for this status, b) recommendations for the correction of the problems found, and c) a description of the situation of each checked item.

The 'Maintaining the Agreement Compliance' task involves holding a meeting with the acquisition

management team and the supplier who conduct a detailed analysis of attendance of each item included in the agreement. Thus, a CANVAS with the checklist of attendance with the agreement items should be generated.

In ‘Accepting the Product Delivered’, which takes place after the product evaluation and the verification of the attendance with the agreement, a meeting is held to formalize the product acceptance and the signing of the Acceptance Agreement by the stakeholders takes place. This agreement must include at least the following information: Name of the Project, Goals of the Acceptance Agreement, Description of the items being delivered, Identification of the stakeholder that sign the agreement (acquirer and supplier), and Signature Date.

C. The Evaluation of Catalog

The evaluation of this work was initially made to check if the compatibility of the activities that form the acquisition process framework of software and related services [7] with regard to the practices included in the SAM process area of CMMI-DEV [2]. For this reason, for an expert in Software Quality and Process Improvement areas was sent a questionnaire to obtain feedback about its evaluation and obtain opinions and suggestions for its improvement.

After this, the evaluation was conducted of the mapping of agile practices that are compatible with the framework activities included in the SAM process area of CMMI-DEV. This was sent to an expert to give feedback about its validity and obtain some opinions about it.

Finally, the Catalog of Best Practices also had its validity confirmed through a peer review carried out by an expert. An attempt will also be made to validate its application in the definition of a process for a software organization, which will involve an evaluation of the efficiency and effectiveness of this catalog to support this activity and bring about an improvement in the organizational process.

IV. EXPECTED RESULTS

The research product is a catalog of best practices about SAM with agile activities that can be used to implement each activity present in the macro workflow. This catalog was examined by an expert in the area of software quality, and will then be submitted to a critical analysis of its validity, usability, compatibility with models and standards, and feasibility for use in an organizational environment.

In this way the validity of its agile activities can be confirmed and with the aid of the catalog, its evaluation will enable improvements to be made to any failings detected by the peer review of an expert.

V. CONCLUSION

This work has shown the importance of using processes for improvement in an organizational environment, especially with regard to the software acquisition process. Its objective is to know and apply the findings of the literature in the area of software development.

To achieve this goal, we conducted in another work [11] a SLM in the preliminary studies of the research area of this

paper, to determine what gaps there are and their degree of importance. After this phase the mapping of an acquisition process framework with agile practices was performed, to provide the necessary basis for preparing the catalog of best practices using agile methodologies for the management of the software acquisition process.

In future work in this research area an experiment should be carried out where the catalog can be used in a study case. This should be conducted in a software development organization so that comparisons can be made with regard to the situation of an organization before and after the implementation of the practices included in the catalog. Thus, we intend to evaluate this together with the members of the organization to ensure that the necessary improvements in the catalog are made to allow it to be adapted to real situations faced by the organization.

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