International Journal on Advanced Science Engineering Information Technology

Vol.12 (2022) No. 6
ISSN: 2088-5334

Mr. Scrum: A Reference Model to Foster and Facilitate the Adoption of Scrum in the Agile Software Development Companies

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***Abstract*—Scrum is one of the most used agile approaches in the software industry. However, some aspects can hinder its implementation, e.g., the lack of detail of artifacts, meetings, generation of the product backlog, and team composition, among others. This paper presents Mr. Scrum, a Scrum reference model obtained from comparing existing Scrum guides and applying the GQM (Goal-Question-Metric) paradigm. Mr. Scrum proposes a clear and complete set of process elements, as well as: purpose, objectives, phases, activities, roles, satisfactory-expected results, and process flows. The proposed model was evaluated through a focus group where its suitability, clarity, and completeness were evaluated. The findings show that the participants agree with the acceptance of the proposed model and that its use in the industry could motivate and facilitate the adoption, implementation, and evaluation of the Scrum implementation. In this sense, Mr. Scrum would allow professionals and organizations to be guided toward a better understanding of Scrum and minimize the subjectivity and error of its interpretation, adoption, and assessment.**

***Keywords*— Scrum; reference model; Mr. Scrum; software agility; software engineering.**

Manuscript received 13 Apr. 2021; revised 7 Nov. 2021; accepted 30 May 2022. Date of publication 31 Dec. 2022.
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I. INTRODUCTION

Nowadays, it is possible to find a wide range of agile approaches used in the software industry, among the most prominent are: Scrum [1], XP [2], Lean Software Development (LSD) [3], and others. The annual report on the state of agility [4] reported that 58% of organizations use Scrum. In this sense, it has become one of the most used agile approaches in the last decade. However, it is possible to list some problems that may arise during the adoption of Scrum [5], such as:

- Problems in defining the sprint timetable in relation to team speed [6].
- Difficulty in defining the times and objectives of the meetings [7].
- Problems with properly generating the accumulation of products [7].
- Lack of knowledge in the composition of the team [8].
- Lack of knowledge of the level of detail in user stories.
- Doubts regarding generation and update of artifacts.

In addition, the lack of training and knowledge of roles [6], as well as issues related to the change of approach and paradigm in teams [7], [8], [9], [10], [11], [12], [13], the lack of transformation of the operational and organizational culture, and the non-adoption of the agile manifesto and values of Scrum can also cause issues.

Although Scrum can allow a degree of local adaptation in the organizations where it is implemented, it is important to have a complete and clear perception about Scrum since according to the creators of this approach, the partial application of it cannot be considered Scrum [14], i.e., Scrum has fundamental elements that should be maintained, thus preserving their benefits. However, the lack of a more detailed structure that serves as a reference to facilitate and foster the Scrum adoption allows the implementation to be carried out informally and erroneously without proper application and institutionalization of the elements and practices that this approach describes [15]. Other reported studies [16] also stand out the importance of having a structure that organizes and guides the application of agile approaches through a specific, detailed, and documented reference model that minimizes the error of interpretation and, consequently, of failures and challenges in its institutionalization, and in this way, to achieve higher levels of adoption and even know the status of Scrum implementation at which an organization is.

Considering the above, this work aims to present Mr. Scrum, a reference model to facilitate and foster the adoption and implementation of Scrum. This model describes a set of detailed and organized process elements, as well as: purpose, objectives, phases, activities, roles, work products, and activity diagrams in BPMN (Business Process Model and Notation) that improve the understanding of the relationships and the flow of the proposed elements. The proposed model has been defined from the adoption of fundamental elements that characterize the most cited and referenced Scrum guidelines by the industry, as well as: the Scrum development process [17], Scrum guide [14], Scrum Manager [18], and Scrum Study [19]. Likewise, it was used the GQM (Goal-Question-Metric) paradigm [20] to define the objectives and activities that make our proposed model.

In the literature, it is possible to identify efforts related to the definition of solutions to enable the implementation of Scrum, among them: ontologies such as Lin et al. [21] that support agile approaches in a general manner. Yin, Figueiredo, and da Silva [22] presented a maturity model with a staggering view of five maturity levels. This conceives the partial implementation of the model. It suggests that some elements and meetings of inspection and adaptation are implemented only at the last level of maturity. This situation draws attention because it goes against the recommendations made by the creators of Scrum [14]. In Kniberg [23], a Scrum checklist is proposed. This list proposes a set of recommendations that allows knowing the status of Scrum implementation at a high level of abstraction. In van Roosmalen [24], it is possible to download an Excel spreadsheet based on the previous proposal. Authors recommend using it as a discussion tool, not an evaluation tool since this list only reflects the authors' personal opinions. Besides, there is no evidence of any evaluation that allows us to know the perception or opinion of other experts on their proposal.

As can be seen, some solutions have been developed. However, few provide a complete and clear solution that facilitates the implementation of Scrum from the "what" should be taken into account, given that; first, it is one of the most widely used approaches to project management worldwide, and second, and as mentioned above, its implementation can be hampered by various drawbacks that affect its correct operation, whether due to misunderstanding, partial implementation of the elements of Scrum or by suggesting adaptations that reduce the desired benefits.

Mr. Scrum has been evaluated through a focus group of industry professionals with extensive Scrum experience, where aspects such as relevance, completeness, and clarity were evaluated. On the other hand, participants' comments and opinions were analyzed and considered to obtain the version presented in this paper. The participants show a good acceptance of our proposal and highlight its importance and the benefits that can be obtained to promote and facilitate Scrum's adoption, implementation, and evaluation.

The rest of this article is structured as follows. Section II provides an analysis of the related work. Section III describes the research method used to define our proposal and also sets out in detail our proposal, which is called Mr. Scrum, a Scrum reference model, whereas Section IV presents the results and discussion obtained from the evaluation of Mr. Scrum through a focus group. Finally, Section IV presents the conclusions and future work.

II. Material and Method

The following steps were carried out in order to define the proposed reference model. These steps focus on as follows:

- The selection of a set of Scrum guides.
- Elements decomposition to understand the structure and composition of each guide.
- Elements homogenization of each guide through a common structure of process elements that facilitate their comparison.
- Elements comparison to identify equivalences and differences between elements.
- Design the reference model based on the results of the characterization and comparison, and finally.
- Model evaluation through a focus group, which is discussed in Section IV. Table I shows an extract of the characterization of analyzed Scrum guides, which consider elements such as; roles, sprints duration, team size, and meetings proposed in various guides.

For the design of Mr. Scrum, the process areas proposed in the Scrum guide presented in Satpathy [19] were taken since they were the ones that best represented the stages of the software development life cycle. In addition, the GQM paradigm was used [20], which defines three levels of abstraction:

- Conceptual level (Goal).
- Operational level (Question).
- Quantitative level (Metric).

This paradigm was applied to scale the proposed model in the future. Thus, facilitating the definition of questions and metrics to support the evaluation of the level of implementation of Scrum in organizations. In this sense, the proposed reference model describes the elements to be taken into account at the conceptual level, and the operational and quantitative levels will be addressed in other works due to the space limit.

Based on the evaluation results of the analyzed guides, the purpose and objectives, roles, phases, and activities of Mr. Scrum are described below. Furthermore, to facilitate the understanding, application, and evaluation, the model also describes a set of satisfactory-expected results, the output of working products for each phase and process diagrams in BPMN available at: https://bit.ly/39q1HhP.

A. Purpose and Objectives

The purpose of Mr. Scrum is to maintain the inspection, adaptation, and transparency of Scrum as fundamental pillars. Therefore, keep in mind the aspects as follows:

- The importance of incremental feedback during project management.
- The software projects advance through iterations based on incremental deliveries.

In this sense, the objectives of Mr. Scrum are as follows:

- To help and guide the industry in the understanding and application of Scrum
- To serve as a reference for the self-evaluation of organizations regarding the status of implementation of Scrum.

- To facilitate the continuous improvement of management project processes based on Scrum.

B. Roles

Table II presents the roles proposed and describes the responsibilities that must be assumed throughout a management project process based on Scrum. Mr. Scrum suggests that a Scrum team size should be between 3 and 9 people. The above was determined by the average number of people that recommend the selected Scrum guides for the characterization, a very large number of people can cause difficulties in coordinating some activities such as Daily Meetings. A bigger size team will possibly need a scaled agile framework, e.g., Scrum of Scrums [25], Nexus [26], SAFe [27], LeSS [28], Scrumconix [29], a Reference Model Based on Agile Values, Principles, and Aspects of Scrum, XP and Kanban [30], among others. On the other hand, Mr. Scrum recommends that the minimum size should be three people. In this way, it ensures that each member has an assigned role. The proposed roles are not intended to be strict for a person, but it is recommended that there should always be a person in charge who executes and comply the suggested functions and duties.

C. Phases

As Fig. 1 shows, Mr. Scrum describes a process flow organized into six phases, which are as follows:

- Start phase
- Planning and estimation phase
- Implementation phase
- Retrospective and review phase
- Closure phase
- Transversal phase, the latter, unlike the previous ones, is complementary.

Although Mr. Scrum offers a division represented in phases, this does not imply that the Scrum approach is partitioned. In contrast, Mr. Scrum treats the approach integrally, and the objectives of the phases are as follows:

- To have clarity about each of the elements proposed in Scrum, take into account the moment in time of the project.
- To take control in each of the phases to raise issues to be corrected in time
- To facilitate the understanding of the metrics delivered by EvaScrum, the proposed evaluation instrument.

Phases, activities, and roles are described below:

1) Starting Phase (SP): The objective of this phase is to identify and know the customer. In addition, the business's desires and justification are determined to have a clear vision of the requirements by the Scrum team. The sponsors are also determined. The team that will develop the project agrees with the project constitution; the necessary resources are guaranteed in such a way that they are available throughout the work plan and other characteristics that initiate the project and that also guarantee their viability and execution under the stipulated conditions.

TABLE I
HIGH-LEVEL COMPARISON OF SOME ELEMENTS SUGGESTED BY SOME SCRUM GUIDES

Compared elements	Scrum development process [17]	Scrum Manager [18]	Scrum guide [14]	Scrum Study [19]	Assimilated to our proposal
Roles	PO, DevTeam, Administration, Project Manager	PO, SCM, SCT, Team, SeM	PO, SCM, SCT, DevTeam	PO, SCM, SCT, Cus, Stakeholders	PO, SCM, SCT, DevTeam, Administration, SeM, Cus
Sprint duration	3-4 weeks	1-6 weeks	NA	1-6 weeks	4 weeks
Team size	3-6 people	NA	3-9 people	6-10 people	3-9 people
Sprint retrospective	NA	1-3 hrs	3 hrs	4 hrs: sprint of 1 mo	4 hrs: sprint of 1 mo
Sprint review	NA	4 hrs	4 hrs	4 hrs: sprint of 1 mo	4 hrs: sprint of 1 mo
Daily meeting	NA	5-15 min	15 min	15 min	15 min
Sprint planning	NA	8 hrs	8 hrs	8 hrs: sprint of 1 mo	8 hrs

Acronyms used: Product Owner (PO), Scrum Master (SCM), Development Team (DevTeam), Not Available (NA), Hours (hrs), Minutes (min), Month (mo), Senior Management (SeM), Customer (Cus)

TABLE II
DESCRIPTION OF THE ROLES IN MR. SCRUM

Acronym	Role	Description	Ref.
SCM	Scrum Master	The Scrum Master is responsible for facilitating Scrum events by verifying that the vision of the approach is understood in the enterprise. In this sense, the person who plays this role must be willing to resolve any concerns related to the approach and solve any problem that may prevent or reduce the production of the Scrum team.	Definition adapted from [18].
PO	Product Owner	It is the person in charge of maximizing the value and justification of the business. In addition, it is in charge of maximizing the development team's work. In this order of ideas, the product owner is responsible for identifying the client's decisions.	Definition adapted from [19].
SCT	Scrum Team	The Scrum team is the group responsible for carrying out the realization of a set of objectives throughout a project, for Mr. Scrum must be composed of a Scrum Master, Product Owner, and the Development Team.	Own definition.
SeM	Senior Management	Senior management in Mr. Scrum refers to the person or persons in charge of making administrative-level decisions. This role is not part of the essence of the Scrum approach. It was added in Mr. Scrum, given that in the texts selected for the characterization, it was a common denominator that there was a role to be in charge of these tasks. In this sense, this role is not mandatory in Mr. Scrum, and applies only to enterprises with this hierarchical level. In the case of being a small enterprise, Mr. Scrum recommends that this role be replaced by the Scrum Team, given that decisions of high importance for the project must be made.	Own definition.

DevT	Development Team	The development team is in charge of making the customer's wishes a reality [13]. The people who perform this role must perform the functional deliverables planned in each sprint [14], [9].	Definition adapted from [19].

2) Planning and estimation Phase (PEP): This phase aims to carry out the planning of a sprint and the execution of the tasks selected from the product backlog are added to the sprint backlog. In this phase, the cycle that allows the number of necessary cycles to complete the tasks outlined in the product backlog is started.

3) Implementation Phase (IP): The objective of this phase is to carry out the activities in the sprint backlog according to the times estimated in the previous phase. To achieve this purpose, it is necessary to design, develop, implement, test, and document the progress made to achieve the sprint's objective.

4) Retrospective and review Phase (RRP): One of the attributes of the Scrum approach is continuously monitoring the activities carried out by the team. In addition, it seeks to constantly learn from the mistakes made and identify the risks of the project and aspects that are considered can be improved. For that reason, in Scrum there are retrospective and review meetings that allow the fulfillment of these objectives. Considering the above, in Mr. Scrum, a phase has been created that follows the aforementioned control guidelines, organizing them in such a way that a clear way of how to carry them out is obtained. In this phase, the sprint is delivered, if there are still pending tasks in the product backlog, a new sprint must be started, and the planning and estimation phase must be returned. Otherwise, the cycle is completed, and the next phase is followed.

5) Closure Phase (CP): This is the last phase of Mr. Scrum. The objective of this phase is to deliver the product and carry out the closure of the project. For this purpose, a series of activities are created to complete the project.

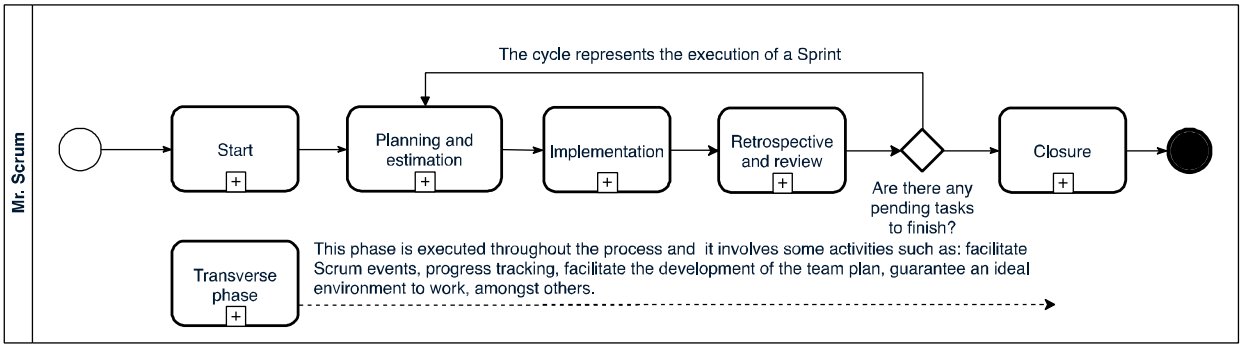

Fig. 1 Excerpt from Mr. Scrum. A detailed version of Spanish of Mr. Scrum is available through the link http://artemisa.unicauca.edu.co/~rzambrano/

6) Transverse Phase (TP): This phase consists of a series of activities that are carried out throughout the project and that do not have a specific time for their realization. In addition, this phase's tasks and development can be carried out more than once. Everything depends on the work team or depending on the situation that the Scrum team faces. Most of these activities are related to the organizational culture and the values obtained in the Scrum pillars. For this reason, although some of the tasks of the transversal phase are complementary, they should not be considered minor phases.

Activities. Mr. Scrum proposes twenty-nine activities to consider, which are described in Table III. These activities are organized into the phases proposed. Furthermore, in order to give more detail and information about who is responsible for verifying the fulfillment of a task and who should execute it according to roles presented in Table I, two attributes were added in each activity called: Responsible for the Activity (RA) and Performer or Participant (PP).

III. Results and Discussion

Our proposal was evaluated through a qualitative research technique known as a focus group [31], which allowed us to refine and improve the proposal based on the opinion of participants with more than seven years of experience in Scrum and their application in software projects. The focus group was made up of six phases which are the following:

1) Defining the research problem: The focus group objective was oriented to obtaining feedback from the participants about the suitability, completeness, and clarity of the elements proposed in our proposal. In addition, the evaluation objectives were focused on: (i) evaluating the proposal; (ii) obtaining recommendations for lessons learned, and (iii) updating the proposal based on the recommendations suggested by the participants. The elements, procedures, and techniques used to execute the focus group were defined in this activity. These focused on structuring the protocol of the debate, defining and socializing the documents to be shared with the participants, defining the methods of capture and registration of information, and analyzing the information obtained in the debate.

2) Selecting participants: The participants' profiles and selection criteria were defined in this activity. These were: having advanced knowledge about agile approaches and experience in the industry of more than seven years of experience in the use and application of Scrum in real projects, this was verified with proven and certified experience. During recruitment, there was a list of 16 potential participants, of which 12 were discarded and only four were selected. They met the defined profile and criteria. Once the participants

were selected, an invitation to participate in the focus group was sent, to which they responded positively. In response, the date and time for the debate session were coordinated with a margin of 3 weeks. Once the debate session was coordinated, the proposal documents were sent.

3) Conducting the focus group session: This activity was coordinated by a research group member as moderator and another as rapporteur. The order and sequence of the session was previously sent to the participants. During the session, the rapporteur took note of each observation and comment made by the participants during the session. Furthermore, in the end, the participants were asked to answer a questionnaire that facilitated answering the questions posed in Table IV.

Data analysis and reporting*:* Once the results were obtained, the questionnaires were analyzed by counting the participants' responses. To carry out the questionnaire, we considered that the questions were aimed at determining the degree of relevance, completeness, and clarity of the proposed model. Table IV presents the questions asked: 13 questions that asked participants about their level of compliance with the elements that make up the proposal (questions 1-13). These questions used a Likert scale: Unsatisfied (UNS), value (1); Little Satisfied (LSA), value (2); Satisfied (SAT), value (3); Very Satisfied (VSA), value (4); Fully Satisfied (FSA), value (5). Three open-ended questions (questions 14-16) were also asked for the participants to comment on the proposal in general (questions 14-16). Questions 1-13 used a level of conformity through a Likert scale.

Fig. 2 shows the distribution of the results obtained from questions 1-13. As can be seen, in general, there was a consensus with Mr. Scrum, i.e., that the elements presented and evaluated during the focus group session were considered mainly relevant to motivate and facilitate the adoption of Scrum. However, questions Q2, Q3, Q8, Q10, and Q13 had not had favorable responses and were considered to carry out improvement actions on the proposal.

4) Improvement actions: The results, comments, and opinions of the participants were analyzed and considered to carry out improvement actions on the proposal, thus obtaining a second version, which is presented in this paper. A summary of some of the improvements made is that some activities considered non-essential in Scrum were eliminated. Some terms to have greater clarity and reduce ambiguity were updated, and descriptions about who is responsible and who is the executor in each of the activities were added.

TABLE III
MR. SCRUM ACTIVITIES

Phases	#	Activity name	Role responsible	
			RA	PP
Starting Phase	1	Defining the Scrum team.	SeM / SCT	SeM / SCT
	2	Create the vision of the project.	SeM / SCT	PO
	3	Identify the requirements from the customer's point of view.	PO	SCT
	4	Identify all interested (partners, sponsors, stakeholders) related to the project.	SeM / SCM	PO
	5	Formalize the creation of the project through a constitutive act of the project and budget.	SeM / SCM	SeM / SCM
	6	Prioritize the elements of the wish list according to the needs of the customer.	PO	PO
	7	Ensure that resources are available for the proper functioning of the project.	SeM / SCM	SCT
	8	Validation and/or re-selection of the development tool: At the moment that the vision of the Scrum team is clear and ready to begin, it is necessary to select one or several work tools that the development team considers necessary. For this reason, the development team must clarify what tools they will use throughout the execution of the plan.	SeM / SCM	SCT
Planning and estimation Phase	9	Detail the customer's wishes and generate a list of requirements that allow detailed information of what should be done in the project.	PO	PO / DevT
	10	Define criteria that allow the Scrum team to know clearly and unanimously when an activity/task is ready or finished to be entered/updated in the sprint backlog (Definition of Ready (DoR) and Definition of Done (DoD)).	PO	DevT
	11	Evaluate and control the possible risks that may occur during a Sprint.	SeM / SCT	SCT
	12	Analyze the changes received for each sprint to socialize and verify requirements and other circumstances that are affected by change requests.	SeM / SCT	SCT
	13	Adapt and/or refine the structure used in the project to adapt to changes that arise in the plan's development.	SCT	SCT
	14	Define the objective of the sprint that will be carried out in such a way that it is related to the activities/tasks that will be developed in it.	SCT	SCT
Implementation Phase	15	Obtain information about the events that occur in the team to resolve any impediment that affects the normal development of the project.	SCM	SCM / SCT
	16	Develop the customer's requirements.	SCT	SCT
	17	Update the Scrum dashboard and the impediments log.	SCM	SCT
Retrospective and review Phase	18	Review and verify with DoD criteria the tasks that have been completed in the sprint.	SCM	SCT
	19	Update the launch plan and the prioritized list of pending products.	PO	SCT
	20	Sprint Retrospective. Post-mortem analysis of what has been done, learned, obstacles, improvement actions, and lessons learned, among others.	SCM	SCT
Closure Phase	21	Help with the launch of the project: This activity prepares what is necessary to release the final product.	SCT	SCT
	22	Implementation tests: Once the product is delivered, tests must be performed in a real environment where correct operation is guaranteed. If necessary, the required changes are carried out so that the product meets all the requirements.	SCT	SCT
	23	Delivery of the product: At the end of the tests and to confirm that the project is ready, the formal delivery of the project to the customer is performed.	SeM / SCM	SCT

	24	Launch meeting: At the end of the delivery, a meeting is held to obtain feedback on situations and positive and negative aspects. This is carried out in order to establish opportunities for improvement to correct mistakes and enhance virtues.	SCM	SCT
Transverse Phase	25	Facilitate Scrum events as required or needed throughout the process.		
	26	Monitoring progress: The success of a project depends on the activities being carried out correctly, which is why it is necessary to verify and control the tasks and results that are being obtained throughout the entire process.		
	27	Help to develop the team plan with the Scrum Master.	These activities are carried out by Scrum Master (SCM).	
	28	Ensure that there is an ideal environment for the Scrum team during Sprints.		
	29	Help the product owner create the prioritized list of outstanding products: The joint work between the client and the Scrum team must be constant so that the client is aware of the process. In addition, it is suggested that the client be advised in the prioritization of the product backlog, ensuring the interests of both the team and the sponsors.		

TABLE IV
MR. SCRUM EVALUATION QUESTIONNAIRE USED IN THE FOCUS GROUP

#	Questions
1	Do you consider that the proposal contains the necessary elements to manage a software project under the Scrum approach?
2	Do you consider that the proposed phases are easy to understand and apply?
3	Do you consider that the proposed activities allow you to meet the objectives of each phase?
4	Do you consider that the structure defined through phases would serve as a reference to evaluate and improve the processes of an organization?
5	Do you consider that the activities defined in SP are sufficient to support the initial conditions of a Scrum-based project?
6	Do you consider that the activities defined in PEP are enough to support a Scrum-based project?
7	Do you consider the activities defined in IP enough to carry out the tasks proposed in a Scrum-based project?
8	Do you consider that the proposal has enough level of detail to support the execution of proposed tasks throughout a sprint?
9	Do you consider that the activities defined in RRP allow evaluating the team's events and taking preventive and/or corrective measures?
10	Do you consider the cross-phase activities to be enough to support the support activities in a Scrum-based project?
11	Do you consider that the model can serve as a reference to support the improvement of processes in an organization that bases the management of its projects on Scrum?
12	Do you consider that the proposed phases manage to fully cover the Scrum approach?
13	Do you consider each of the proposed aspects clear and concise?
14	Do you consider that some activity (s) should be in a different phase from the one proposed by the model?
15	Do you consider that there are activities that should be eliminated?
16	Additional observations and/or appreciations.

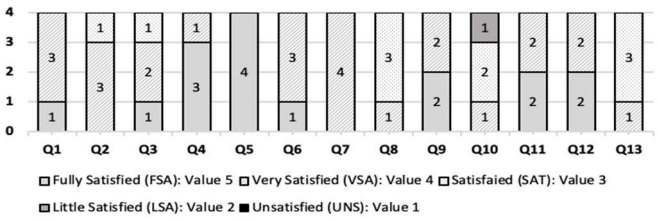

Fig. 1 Consolidation of questions 1-13 answered by the focus group

5) Research construction: To guarantee that the research construction in this study was valid and in line with our research objectives, three techniques were used: the first, to define, maintain and respect the content and format established for the focus group session; second, reduce instrumentation errors by recording the audio of the discussion session; and finally, to reduce the potential bias in the interpretation of the results through a person external to the research which reviewed all the interpretations made during the analysis.

6) Limitations: Some limitations and solutions that emerged during the focus group are described below: (I) although there is a predefined format and agenda, at the beginning, it was not so easy for the moderator to have control over the style of discussion on the least active participants, this was corrected by the most experienced researchers as soon as it was detected; (ii) some embarrassing situations that originated due to the incorrect responses of the participants were mitigated by the active participation of the moderator; and (iii) to mitigate the risk of participants' limited knowledge and understanding, participants with the same experience were selected, early reading material was provided, and some complex issues were divided into more "digestible" pieces.

IV. CONCLUSION

This paper presents a reference model to support the implementation of Scrum in the industry and software services. The model is a more detailed, documented, and clarified description of the elements to consider in applying this approach. The model's definition was obtained from applying the GQM paradigm, which allows the elements defined in the proposed model to be based on clear and measurable objectives, which can be extended by defining questions and metrics that allow evaluating the elements. defined in our proposal, and therefore, know the status of Scrum implementation in an organization.

The reference model structure has been proposed to reduce the ambiguity and confusion that may arise during the application of Scrum in organizations, and therefore, facilitate its understanding and adoption thanks to the detail incorporated in each of the proposed elements, which are based on Scrum. Likewise, which roles contribute to the realization of the proposed activities is made clear. It is detailed about which role would be responsible and which is the executor, and it is established: the activities and artifacts, work products, and process diagrams in BPMN.

The results achieved during the evaluation of Mr. Scrum through a focus group allowed evaluation of the relevance, clarity, and completeness of this by a group of experts. With the evaluation results, the participants made suggestions that were considered opportunities for improvement and that were taken into account to generate the version of Mr. Scrum presented in this document. In addition, it was evident a good acceptance of the participants, who agree that the use in the proposed model industry facilitates the adoption and

implementation of Scrum and could be a reference to take into account to carry out the evaluation of the level of Scrum implementation. They also add the need for these types of solutions/instruments to guide the work done with this agile approach. As future work, it is expected to extend the proposed reference model with the definition of a set of questions and metrics based on the proposed objectives/activities. This will allow for an extension of the model's capacity and enable the possibility of knowing the status of Scrum implementation in the industry.

ACKNOWLEDGMENT

Professor Ph.D. César Pardo gratefully acknowledges the University of Cauca's contribution, where he currently works as a Full Professor.

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