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AN OVERVIEW OF A CONCEPTUAL MODEL OF AGILE MEETINGS PROBLEMS AND PROCESS ISSUES IN SOFTWARE INDUSTRY

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Abstract

Agile meetings are the core of agile methodologies and deserve attention. Given that various problems arise during meetings, the aim of this paper is to present a conceptual model of problems in agile meetings and their relationship with process issues in the IT industry. The problems were identified through literature analysis, and the presented model is based on the interpretation of the identified problems and their relationships. In addition, the presented model includes relationships between agile meeting problems and process problems identified in the literature. Each meeting problem, process problem, and all relationships in the model are discussed. The model can serve as a basis for a more comprehensive examination of problems in agile meetings.

Keywords: *conceptual model, agile meetings, meetings' problems, process issues, agile, software industry*

INTRODUCTION

Agile methodologies are a family of software development processes that have become popular [1], [2], [3], [4], [5]. Their aim is to deliver products faster, with high quality, and satisfy customer needs [6]. Agile approach is a methodology which has been introduced as an effective approach for developing software to increase productivity and efficacy of software development process. The rapid deployment of solutions, early and continuous delivery of valuable products to the customers are the key principles of Agile [7].

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Integrating code between teams can be a problem. Integration problems are often discovered at the last moment, as team members sometimes integrate their work at least a day before the planned delivery date. The user can also modify the request during the iteration. All this can slow down the pace of development [8], [9], [10]. Collecting, understanding, and managing requirements is a critical aspect in all development methods. This is true for Agile Methods as well. In particular, several agile practices deal with requirements in order to implement them correctly and satisfy the changing needs of the customer [11].

Based on the previously stated, the objective of this paper is to present a conceptual model of agile 'meetings' problems, their relationships, as well as relationships with process issues in IT companies.

The rest of the paper is structured as follows. The second section outlines related work in the field of conceptual models in agile methodologies. The third section presents a conceptual model of problems with agile meetings and their relationships with process issues in IT companies. The fourth section contains discussion of the model. The last section contains concluding remarks and directions for further research.

RELATED WORK

"A conceptual model is a specific description of a computer simulation model that describes the goals, inputs, outputs, content, assumptions and simplifications of the model" [12]. Effective conceptual modeling requires abstraction to be simplification [13]. There is no standard for assessing the quality of conceptual models. Conceptual models continue to be evaluated in practice based on common sense, subjective opinions and experience. In order for conceptual modeling to progress, quality standards must be defined, harmonized and applied in practice [14].

A grounded theory study of agile requirements prioritization methods to provide a conceptual model for understanding the prioritization process between iterations in terms of inputs and outputs is presented in the study [15]. The latter was performed using qualitative empirical data previously published by other authors. Such a conceptual model makes explicit the concepts that are tacitly used in different agile requirements prioritization methods and can be used to structure future empirical research on this topic.

METHODS AND DEVELOPMENT OF CONCEPTUAL MODEL

Based on the literature analysis, a conceptual model was created. Selected studies from the literature are used to develop a conceptual model that represents the relationships between agile meeting problems and process issues.

The authors found a large number of problems [23] that occur when applying the Agile methodology, which refers to problems related to the meeting. Relevant literature was collected using the method of systematic literature review [24], on the basis of which appropriate problems were found. Systematic literature reviews can be manifested as a methodology and a product of scientific research.

The following process was used to identify the most relevant studies:

- Choosing a keyword for research:{agile meeting OR agile standup} OR{sprint planning OR sprint review OR sprint retrospective OR daily stand up} OR {problem OR obstacles OR challenges}', '{agile} OR {problem OR obstacles OR challanges} OR {meeting in related other problems);

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- Looking at the digital library, trying to research keywords based on inclusion and exclusion criteria (IEEEXplore, Science Direct, Google Scholar, Springer, ACM, Wiley, Taylor & Francis, SAGE);
- Analyzing each paper through the title and abstract;
- Downloading papers that cover the search criteria. Carefully reviewing the introduction and conclusions and quickly reviewing other parts of the paper.
- Asess quality of papers

Figure 1 shows the phases that were involved in the literature review process [26] [27].

Based on the previous analysis of the selected publications, using inductive thematic analysis [23] (Grounded theory reviews examine the development of a specific theory in the domain of the review) [25] and on the basis of the themes identified in the previous thematic analysis [23] we came to certain problems for the presented conceptual model such as problems with long duration of meetings, with frequent holding of meetings and with sharing of information between team members. There are many problems related to meetings, but a model for process problems is presented.

Meeting issues and process issues are represented in the conceptual model in Figure 2. Relationships between meeting issues and process issues are highlighted with orange lines. Meeting issues are marked with light blue ellipses and processes are marked with dark blue rectangles. Problems from one group are also interconnected. Problems in meetings are connected with light blue lines, while problems of a procedural nature are marked in black. All the individual meeting questions are explained in the following subsections, as well as the relationship between these questions and the process questions.

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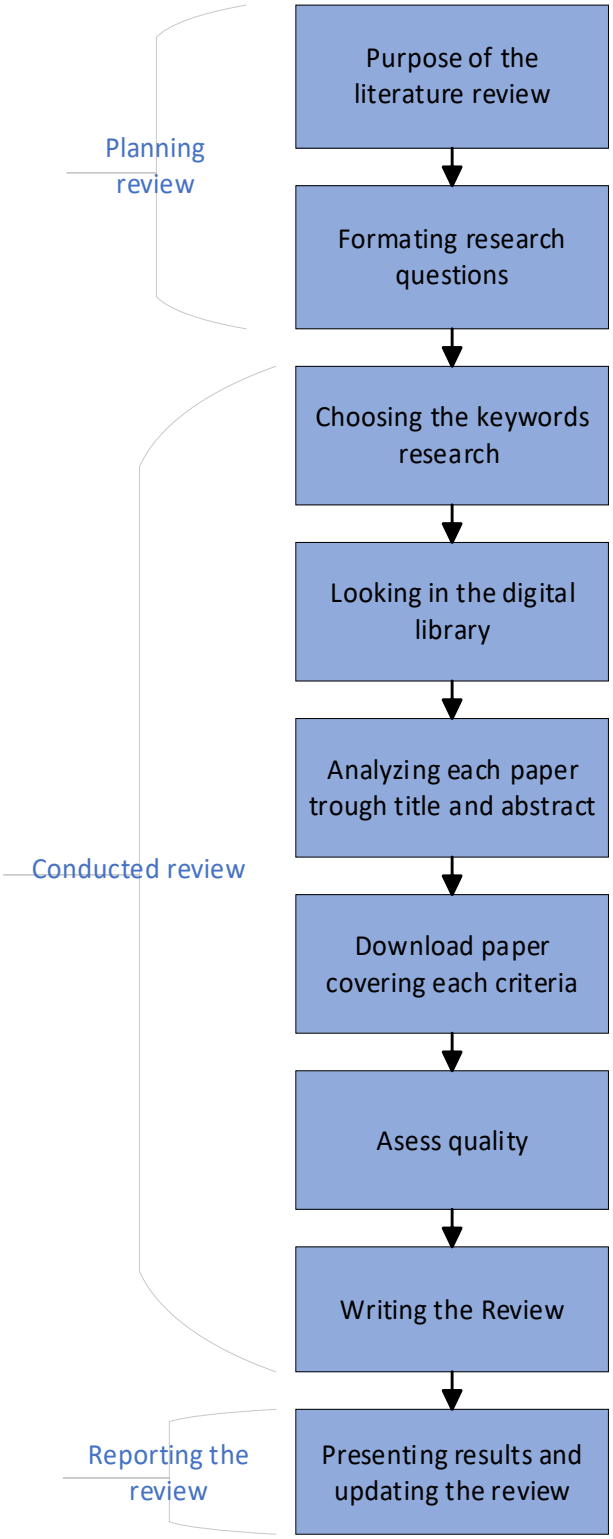

Figure 1: Literature review process

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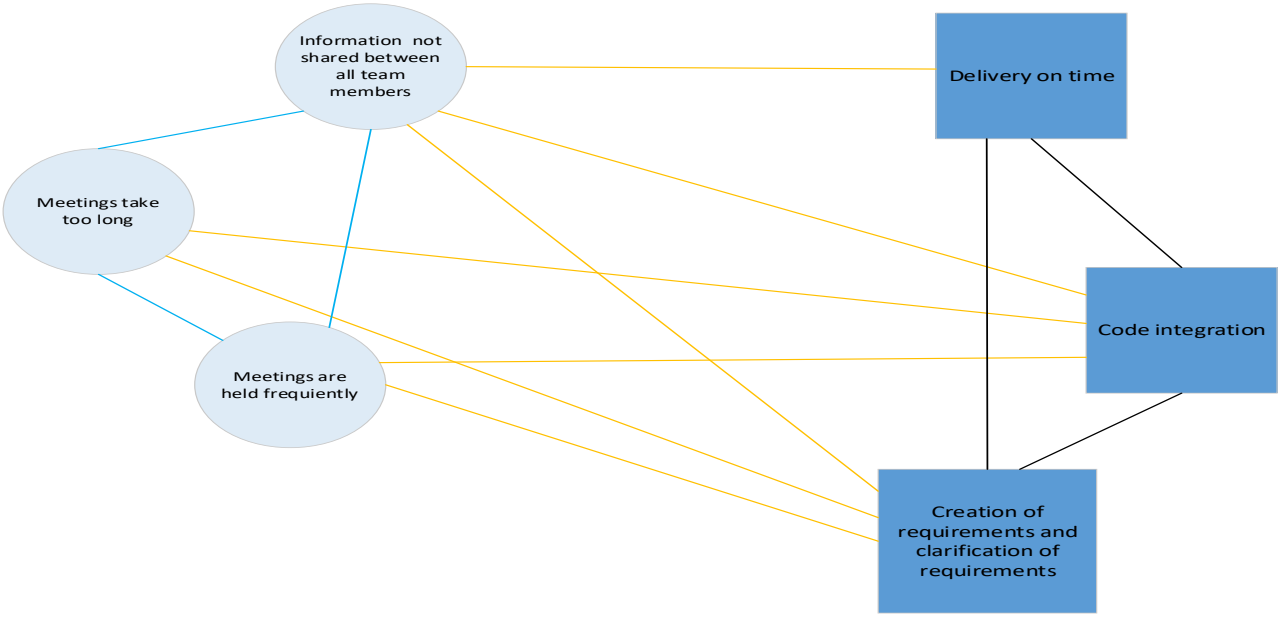

Figure 2: Conceptual model of agile meeting problems and relationships with process issues

Agile meetings problems

Meetings take too long: In a 2013 study, respondents complained that meetings were long and that many meetings lasted longer than the allotted time period [16]. The meetings were sometimes overdue because it was difficult to reach an agreement on some procedural issues [17]. Four deviations were identified during the daily Scrum event [18]. During the four observed days in each team, some observed differences were the average length of meetings, developer punctuality, and developer input on key issues discussed during meetings.

Meetings are held frequently: The frequency and time of day of the meeting have been changed [19]. If the meetings started at the beginning of working hours, mostly in the morning hours, the quality of the meeting would decrease. If there are frequent changes to the user's requests, the meetings will take time to work on those requests and there may be delays in delivery.

Many members complained that they were prevented from spending more time doing their other work activities [20]. Due to the frequency of meetings, some team members will pay less attention to meetings, that is, they will listen less during meetings. Also, the frequency of meetings can affect the length of meetings.

Information not shared between all team members: In some meetings, team members reported only to the meeting leader instead of all team members [16]. A study describing and interpreting agile developers' lived experiences with daily stand-up meetings (DSMs)

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concluded that experienced developers' DSMs were too short to facilitate clear identification and problem solving during the work process [21].

Process issues and problems

The following problems are presented under this category:

- code integration [8],
- on time delivery [8],
- creation of requirements and clarification of requirements [8], [9], [10].

Integrating code between teams can be a problem. In [9], each team performed their daily Scrums and aimed to complete the tasks assigned to their team. Members of one team did not have enough time to deal with the tasks assigned to the other team and as a result many functionalities were not synchronized, they did not remember to communicate the changes to everyone or even did not communicate the information to the people they work with they don't get along so well. Integration issues were often discovered at the last minute of release, as both agile teams began integrating their work at least one day before the planned release date. Because problems were discovered late, it caused a lot of reworks and many releases were delayed. The speed at which the teams worked was quite high. The turnaround time ultimately affected the time to resolve the issue and delayed the release. Although clarifications were obtained, they were not systematically communicated to other team members mainly because developers would often forget to include everything in their communication or thought the information would not be relevant to colleagues.

Integration issues were often uncovered at the last minute when performing a release as both sub-Agile teams would start integrating their work as least one day before a planned release date. This was performed on a weekly basis and a release made to the system testing team. However, since the issues were uncovered late, this caused a lot of rework and quite a number of releases got delayed [8].

The first project was not implemented on time and way off its target delivery date. The main reasons for late deliveries were the large number of defects that were raised due mainly to integration and coding issues. The second project also faced some similar issues as first project. Releases were not on time due to integration problems and also lack of coordination with external teams such infrastructure meant that environments were often not working as expected [8].

One of the challenges is related to creating and using requests [10]. Sometimes the requests are not mature enough. If new technology is to be implemented, then the requirements are not always well understood. Sometimes product managers are not fully aware of non-functional requirements. Time to market is influenced by competitors. It may happen that competitors come up with a similar product. Then the product should be released earlier with at least the same features as competitors to avoid losing sales.

The user changing the requirement during iteration [9]. The team was working on a user story and the product owner identified the changed text in the user story in their issue tracking software. The change was so fundamental that certain features of the software product had to be changed. All this slowed down the pace of the team, where team members had to do another sprint planning and new code.

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Their analysis identified programming-related work impediments, such as changed requirements, errors, and developers waiting for information; interaction-related interruptions, such as customer requests and formalized meetings; and interruptions imposed by the external environment, such as technology-induced interruptions and interruptions caused by the work environment.

Relationships between agile meetings' problems and process issues

We believe that a big problem can be meetings that last a long time, that are often held, as well as not sharing all the relevant information at the meeting.

If the meetings are long and frequent, there may be a delay in solving the problem (writing the code to determine the tasks), and therefore in the integration of the code. Also, while the meetings last, a lot of time can be lost for the implementation of the user's requests. If during the meeting not everyone receives relevant information, some employees will not solve priority tasks and the like, there may be a problem, which leads to delivery delays.

DISCUSSION

Based on the literature review, the conceptual model with relationships between the mentioned problems was created and described.

Based on the conceptual model, issues can be discussed during meetings that are key to issues such as on-time delivery, code integration, and requirements creation and clarification. It can be concluded that meetings can take up employees' time and that this can affect on-time delivery, therefore solving problems where the code needs to be integrated with the rest. If not enough information is conveyed at meetings, there may be problems in solving user requests, as well as delays in product delivery.

Great attention should be paid to the quality and length of meetings. Employees should spend a lot of time dealing with customer requests. The client must not wait, and the product should be what he asked for according to the requirements even if he can change the requirements during the project. In order to resolve all requests in a good way, it is necessary to listen during the meeting so that no important information is overlooked.

Research implications

This conceptual model can be used by industry practitioners. Although this model covers the issues that arise in agile meetings, it can help practitioners understand the importance of the meeting and see how problems can potentially be resolved, keeping in mind that customers must feel satisfied with the product and therefore do not like delivery delays.

Practitioners can understand that it is desirable to create a technical solution for conducting a meeting, which would make it easier for employees not to spend a lot of time on meetings but on solving their tasks, all with the aim of having more time for other work tasks so that they manage to honor all client's requirements and not to be late in delivering the product.

Researchers can take lessons from this work on how to create a conceptual model of certain problems they see occurring and then work through those problems of their own and come up with some solutions. Also, based on this conceptual model, researchers can see some of the problems with meetings that are related to process items and expand the research with more problems that can potentially arise.

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Validity of the research

Although the mentioned research implications point to the strengths of this work, the authors are aware that there are certain limitations to the validity of the research.

When selecting studies, we followed the guidelines for creating a conceptual model and clearly described the model [22]. It is possible that we missed some case studies that were published in digital libraries that we did not search. Extracting data from the available papers was difficult because many studies did not explicitly mention and explain each of the problems we observed, requiring interpretation of the data, which includes personal bias. This threat was minimized by having some of the issues appear in multiple papers written by different authors.

The findings relate to problems in meetings that apply Agile methodologies, so the applicability to projects that apply other methodologies is questionable. However, the latest projects and research in the IT industry are based on Agile methodologies, which increases the generalizability of this review.

CONCLUSION

This paper discusses the importance of problems that may arise during the implementation of agile meetings. This is shown in the paper in a conceptual model, where the advantage of the mentioned model is that employees can see specific problems that arise during the process of working on projects, as well as problems related to meetings and their relationships, where they can more easily recognize which of these problems are potentially happening in their companies.

In the future, the authors could develop a more comprehensive model to represent all issues related to meeting problems, such as human resource issues, work processes, project management, and the like. There is a need to examine how meetings are conducted in the IT industry and how to make a good relationship between meeting timeliness, meeting frequency, quality communication with on-time product delivery, integration of required code, as well as appropriate client requirements.

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