Proposal for Research Methodology

PA2512: RESEARCH METHODOLOGY IN SE

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Thesis	Tentative title	A Framework aimed at Effective Knowledge Management in Agile Software Development.
	Classification	Research and Empirical
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1 Introduction

Knowledge Management has been a subject of prominent importance in Software Development. We all know this famous quote, “Knowledge is divine” and this rightly fits into the knowledge centric activity of software engineering. Over the decade Software engineering has undergone several changes, and Agile Software Development has marked its eminence. The Agile Manifesto was formulated in the year 2001, marking the changing nature of software engineering[1].In software engineering, knowledge is dynamic and evolves with technology, organizing culture and changing requirements and is structured with a Knowledge Management framework[2] Agile Software development unlike the heavyweight traditional software development doesn’t bank more on documentation but on direct communication. This attribute of less documentation has been criticized by many researchers over the years. According to [3] studies reveal that most of the agile practitioners feel documentation pretty important. In case of agile software development, most of the knowledge is tacit and this is termed as implicit knowledge. Knowledge Management deals with the transferring the latent or the implicit knowledge into external knowledge and further transmitting this explicit knowledge from individuals to other fellow colleagues of the organization across the globe and effective use of this knowledge [4]. Apart from the transferring of the knowledge

there are also other factors which could be important, like the confidentiality of data to be shared, organizational ethics and professional ethics etc., Knowledge Management also plays a key role in distributed agile software development where the development process is carried out over a distributed platform[5]. Several practices for managing knowledge are being practiced in different agile methods. Studies show that eXtreme programming has provided promising results with pair programming for managing knowledge[6].

In [7] a brief description of various practices which are available for knowledge management in agile projects. Briefing some of the methods, they mentioned about release and iteration planning, pair programming and pair rotation, daily scrum meeting, cross functional teams and retrospectives.

[1] represents a systematic literature about the agile software methodology, the manifesto and the various methods of agile software methods. It also deals with the advantages and the limitations of agile methods.

[2] gives the description of Knowledge management practice in Software Engineering based on case studies and also state that the currently deployed methods for knowledge management are not sufficient.

C. J. Stettina and W. Heijstek in their work [3] state the importance of documentation in the agile platform and [4] details about the knowledge management practices that are carried out in the case of agile software development. The article [5] interprets the prominence of knowledge management over a distributed platform and [6] talks about pair programming, one of the salient method of knowledge management.

From the existing literature we have identified that there is no explicit way of knowledge management in Agile Software Development unlike Traditional software methods. There is a need for more empirical evidences in identifying the importance of knowledge management on the agile platform. Solving this problem would have an impact on developing software more efficiently giving a better product.

In section 2 the aim and objectives of the project have been discussed and further section 3 deals with the research questions which were framed after going through the available relevant studies. Section 4 describes the method used to answer the research questions. Expected outcomes are detailed in section 5. The time plan is elucidated in section 6 and the possible risks are defined in section 7 in the proposal.

2 Aim and objectives

The main aim and objective behind this project is to get an insight regarding the knowledge management in agile software development. The project is also being aimed at recognizing the importance of knowledge management in agile software development. From the empirical data gathered, we intend to develop a framework or improve an existing framework that may improve the concept of knowledge management in agile software development.

- Conduct a Systematic Literature Review to identify the various issues related to knowledge management in agile software development.
- Gather in-depth knowledge about various existing knowledge management frameworks which are being used in agile software development.
- Identify drawbacks (if any) in the existing proposed models.
- Develop a new framework or enhance an existing knowledge management framework.

3 Research questions

RQ.1.What is Knowledge Management from a practitioners' perspective?

RQ.2.What are the challenges being faced in existing frameworks or methods that are being operated in Agile Software Development?

RQ.3.What can be done for enhancing Knowledge Management in Agile Software Development?

4 Method

A. Research Method:

Based on the research questions, we have planned to conduct an online survey to answer them. We will firs formulate an open ended survey with the three open ended questions. The same research questions mentioned above will be our survey questions. This questionnaire will be formulated for software practitioners who are dealing or have dealt with Knowledge Management in software engineering. We have chosen online survey as our research method because, given the limited time an online survey would be the most apt method for carrying out the research. Among the other methods that could possibly yield similar results, there are personal interviews which is not feasible for the given time period

B. Data Collection Method:

The data collection method is an online questionnaire. A questionnaire with the above stated questions is sent to a software company and the practitioners are requested to answer the questions genuinely. The answers from the questionnaire are then collected for analysis.

C. Data Analysis Method:

The collected responses from the respondents are analyzed. For this, the data analysis method that we have opted is Grounded Theory(GT) approach. The results of the GT approach are compared with that of the existing data from the literature and the results are elucidated. Another reason for us to consider GT is that, in GT the analysis starts immediately after the first unit of data has been collected[7]. Hence, data analysis can be done simultaneously with data collection. This saves us time.

5 Expected outcomes

After implementing the project, it is expected that we can draw conclusions regarding the knowledge management techniques that are currently in practice. Apart from the functioning of the techniques potential drawbacks will be identified. The benefits and the drawbacks of the various practices are tabulated in a tabular form and the usage of various knowledge management practices are presented in a pie chart or a graph. Finally a new framework or enhancement of an existing model is proposed and the model is explained with the help of work flow diagrams and flow charts.

6 Time and activity plan

RM Project: 07Feb2014 to 14Mar2014(35 days)

*RM Proposal: 07Feb2014 to 21Feb2014(10 working days)

- Writing Proposal: 10Feb2014 to 14Feb2014(5 days)
- Verification and evaluation: 17Feb2014 to 19Feb2014(3 days)
- Final Verification and Patch Work: 20Feb2014(1 day)
- Submission: 21Feb2014(1 day)

*Systematic Literature Review: 24Feb2014 to 04Mar2014(10 days)

- Formulate Search String and collect research articles: 24Feb2014 (1 day)
- Extract data from literature:25Feb2014 to 28Feb2014 (4 days)
- Analysis and synthesis of data: 01Mar2014 to 04Mar2014 (4 days)

*Developing framework: 05Mar2014 to 14Mar2014 (10 days)

- Analysis of existing models from literature: 05Mar2014 to 07Mar2014 (3 days)
- Identifying drawbacks: 08Mar2014 to 09Mar2014 (2 days)
- Designing Solution Framework for drawbacks: 10Mar2014 to 11Mar2014 (2 days)
- Verifying and validating framework:12Mar2014 to 13Mar2014 (2 days)
- Submission of RM Project: 14Mar2014 (1 day)

Note: Documentation is done simultaneously throughout the course of the project.

7 Risk management

- Time constraint is a potential risk in the current project since the designated time span is for 51 days and there is a possibility of falling short of time. This risk is mitigated by reducing the scope of the project accordingly keeping in mind the time present to complete the project.
- Another possible risk that might pop up is insufficient literature or articles whose full text is not available in the database of BTH. However, this can be resolved by applying to the BTH library requesting to purchase the unavailable article if it is really necessary for the project.
- There is a risk of selecting primary studies which are relevant to the current project but the data it possesses does not have any empirical evidences. This is mitigated by taking care and making sure that all the primary studies are well analyzed and verified.
- Due to the limited time in hand, there is a risk of not able to implement the proposed model perfectly. In such a case we are keen in carrying out the project for the master thesis in future.

References

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