Project plan for Master degree project

PA 2534: Master Thesis in Software Engineering

Version NUMBER – March 8, 2016

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| Thesis | Tentative title | Agile adaptation during testing phase in context of large software agile projects. |
| Classification | PROVIDE UP TO 3 LOW-LEVEL CATEGORIES\* |
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\**2012 ACM Computing Classification System: www.acm.org/about/class/2012*

\*\**Co-advisor from industry or a higher education institution (HEI).*

# Introduction

The research thesis to be conducted is in the stream of software engineering.

1. **Aim and Objectives:**

Our main aim of our research project is “To identify the problems that are addressed while implementing the agile test practices and associating them with the benefits of different types testing tools that are suitable for Agile test environments”.

The corresponding objectives to reach the aim are as follows:

* While implementing the agile test practices some problems are identified, to identify and study those problems a systematic literature review is conducted.
* To identify where there is more need for test tool support that can improve the agile software development effort by conducting a survey.

# Research questions

1. What are the type of problems that are expected to be addressed by agile test practices?

The Research question help to design a framework by using a systematic mapping between the problems addressed and benefits of different types of agile tests. For example: In TDD some papers suggest about improve in quality others contradict by saying only improved by 24 to 30 % which is not 100 %. One place where the problems addressed by the agile test practices and the framework systematically mapping with corresponding benefits can be addressed using this research question. Our motivation is to consider the research after 2012 as we have seen one paper research contribution from 2002 to 2012 later the extra 2013-2015 are taken into consideration for systematic literature review and are validated as well.

1. What are the testing tools that are applicable to agile testing situation?

Our Motivation is there are several tools that are applicable during agile testing situations. Different tools contribute to different programming languages. Example CppUnitTest which can be used in c ++ language; Junit which can be used in java programming language; RakePyUseCase which can be used in python. Our Motivation is currently to look into all the test practices , but in future we would like to select subset of tools in a specific programming language or the tools that are existing currently in the industry and remove those tools whose usage and maintenance is stopped.

# Method

The selected research methods are described in detail. A brief description on how the research design data analysis is going to be carried our is also being mentioned. Note the research design and data analysis is yet in developing phase so, there is a possibility that the structure adopted currently can be slightly changed which we believe might happen and we hope it doesn’t affect our thesis.

**Research method:**

**Systematic Literature Review:** Procedure for RQ1 is as follows- Based on kitechenhamn guidelines we are planning to conduct a systematic literature review. Systematic literature review purpose is to provide an exhaustive literature in existing area relevant to research questions. Literature review consist of current knowledge in findings, theoretical and methodological contribution in a specific topic []. Based on a research question the systematic literature is focus on trying to identify select and analyze high quality evidences available relevant to the research questions []. Snowball sampling is used as our sampling selection criteria to study from relevant literature and retrieves the data until no more is related to the research question [].

**Sampling Method:** Snowball sampling is important as our research question identifies the problem’s being addressed by the agile test practices so, the efficiency is important criteria here which can be achieved by utilizing the snowball sampling technique. To start the research, the primary key words that can be used to ideally start literature review can be done by using keywords agile test practices, benefits, problems addressed. Narrative synthesis is used for the data analysis phase to explain the problems addressed with the benefits of agile test practices. This helps to identify what are the problems being addressed while using the agile test practices tools.

**Survey for RQ2:** based on the literature data obtained and the relevant problems addressed what are the testing tools that are highly used while implementing the agile test practices can be analyzed using the survey. The research question 2 is based on survey based questionnaire (data collection tool) to obtain quantitative data. We use survey which is based on data collection tool questionnaire. Questionnaire that are generated are specific to help respondent to understand without confusion. In our case we plan to involve both open-ended questions and close ended questions. We are planning to use snowball sampling which involves reaching population that are hard to find through the process of connections. Convenience sampling help to find a few people that are working in the relevant topic can be contacted with the help of few contacts we have. Electronic forms are also used to collect data from the research question 2. The data analysis is made by applying the statistical analysis techniques to identify from the formulated research questions where the focus is needed while implementing testing tools.

**Choosing Other methods:** Although interviews and case study can also be conducted in our case. We can conduct a semi structured interview. The Semi structured interview is one of the type of interview where the respondent is freely able to talk as long as the subject is relevant to the topic []. It is also an effective way of communication which involve both verbal and non verbal communication while gathering information. We use survey over interview because it is cost effective and efficient and easy to compile data. Case study help to study the group and the individual within the group. Case studies are useful to gather both qualitative and quantitative data. Currently we are not in contact with the software industries to identify the connections and establish a protocol to implement it can be possible when we start our project but as of now we do not have any connections. We are not sure so we are not enclosing any further information related to case studies at this moment. Experiment is also a close study within the industry where the independent variable is manipulated by the experimenter and the dependent variable is measured. IT involves control variables as our connections with industry is poor so, we limited our option to survey.

# Expected outcomes

The expected outcomes for the research questions identified for agile in context of software testing are as follows.

* For research question 1 we identify what problems being addressed while using the agile test practices then later a framework can be generated by following systematic mapping displaying problems addressed with benefits of types of testing. Then a tangible outcome can be represented showing the problem addressed by specific tools with corresponding benefits.
* Research question 2 enables to give data on what type of test tools are used during agile testing this helps to identify where the test tools need more support to increase the agile software development effort while testing. Our motivation is to provide a tangible outcome showing which tools are existing in the language and that need more focus on further tools support needed. Outcomes of Research question 2 can be changed based on ur motivation to reduce the scope during project implementation so, only very generic expected outcome is being addressed here.

# Time and activity plan

The time plan for our activity throughout the course is as follow: Work done by: Kavya for particular event: 1; KARTHEEK for particular event: 2

2016-01-25 Started working on project relevant literature study (1) and

Formulating the research questions (1).  
2016-01-31 Started documenting the project plan (2).

2016-02-07 Project plan submission to examiner (1).

2016-02-08 Started doing systematic literature review (1)(2).

2016-02-03 End of Systematic Literature Review (1)

2016-03-03 Preparing Questionnaires (1)

2016-03-08 Performing the Survey (2)

2016-04-05 Transcribe all the interview data (1)(2)

2016-04-11 Starts analyzing the data (1)(2)

2016-04-15 Results are discussed with supervisor (1)(2) and

Data analyzed is conducted additional source of evidence (1)(2)

2016-04-19 Starts drafting the final thesis (1)(2)

2016-05-18 Final draft submission of the thesis (1)(2)

2016-05-29 Reported the document to opponent (1)

2016-06-01 Presentation of Master Thesis (1)(2)

2016-06-12 Final Submission of thesis Report (1)(2)

# Risk management

General risks in the view of project to be conducted.

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| S.no | Risk | Cause | Mitigation Strategy |
| 1. | Improper Time Management | * Not able to complete the projects within deadlines. * External entity influence deviation form scheduled work. | Maintaining weekly reports and having meetings with the project supervisor, reporting the project progress to the supervisor and doing necessary revisions and corrections to the schedule. |
| 2. | Technical Risks | * Update may arise all along the project to improve the version of the software. * Considering different test tools for evaluation, some times some are purchased once where some organizations doesn’t implement but the tool is efficient. | * Adhering to a fixed version of software utility tools and not upgrading them through out our project. * Reduce the scope by considering only important or commonly used in different industry. |
| 3. | Scope | * The scope of the project can be changed in the course of the project’s progress. | * Planning thoroughly and effectively the entire project can mitigate it. And feedback must also be taken from the supervisor regularly to make sure whether the project is inside the scope or not. |
| 4. | Human error | * Some research articles may exclude in over view. | * One should be careful while searching for the articles by taking the relevant search strings to the topic you choose and formulating it. |
| 5. | Research method bias | * Now in proposal we planned to select systematic literature review and Survey. Choosing them may not be efficiency while working on project in future. | * We would adopt to other research method say interviews if the efficiency can be improved. So, we are wiling to be flexible in utilizing correct data collection tools. |

Risks that may arise while working in on research methods Below table shows the identification of risks and its likelihood, impact, avoidance and mitigation strategies are addressed.

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| Risk | Why it occurs? | What are the impacts? | How to avoid it? | How to mitigate it? |
| Interpretation validity | It generally occurs when incorrect interpretation is done from the collected data. | Depending on one’s own notation of understanding rather than what the actual data is being told.  Manipulating based on his own view point rather than from the view point in the collected data. | In order to avoid the interpretation validity we can choice to add open ended questions to answer elaborately. | Interpretation and communication skills can be improvised.  Questionnaire should not be confusing to be answered.  Member checking can be used. |
| Descriptive validity | It occurs when the data collected or told is not recorded correctly. | T might result in false values that impact and change the end systematic mapping framework. | It should be recorded and maintained properly.  Recorded data shouldn’t be the shorter version of what actually being said or collected. | In order to reduce it is important to keep track of all the record.  Can use online tools to store the collected data.  Can be transformed to google excel sheets. |
| Theory validity | The initial specific theory that the researcher believes should not be aligned with what the actual data is collected. | This impacts the entire project.  False proofed statement are not trusted by industrial practitioners. | We ensure that we do not coerce the data.  Try not to match the obtained data with the expected data by manipulation. | Each and every detail should be presented.  Results should be accepted even if it does not prove initially believed theory. |

## References