

# PRIORITIZATION OF REQUIREMENTS BASED UPON QUALITY APPROACH AND INTERACTIVE GENETIC ALGORITHM FOCUSED ON AGILE METHODOLOGIES

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## Abstract

*Prioritization of the requirements is the essential mechanism of agile software development approach. In agile world the software is built in different cycles, and each cycle built the features which are prioritized according to the stakeholders as in turn it maximizes the value delivered to the client and accommodates the changing needs. The order in which requirements are implemented in a system affects the value delivered to the final users in the successive releases of the system. But sometimes situation occurs when conflicts arises between the different stakeholders including user that to which feature or requirement to be built first and sometimes the conflicts get solved but many times project gets stuck in between as conflicts does not get solved, so to overcome this we are developing a tool through which we can reduce the disagreements between the client and the developer based on the interactive genetic algorithm.*

**Keywords** agile, genetic, prioritization, requirement, quality

## 1. Introduction

Agile methodology is an approach to project management which is used in software development. It helps team members to respond to the unpredictability of building the software through incremental, iterative work cycles which are known as sprints. This methodology was basically developed to deal with certain situations where the waterfall model fails. Agile development methodology is the methodology which is

built keeping in the mind the users or clients of the various software. It performs its activities through an iterative cycle to build and test followed by an assessment by the user business until they are satisfied with the product. Thus by focusing on the repetition of the work cycles as well as the functional product, the agile methodology could be described as an iterative and incremental approach.

Agile is highly disciplined approach. Agile most of the times draw comparison with the waterfall model which is highly structured and is in a stage-wise manner. Waterfall model is very difficult to follow if the requirements are ambiguous and are misinterpreted and require changes during the time span of the project.

As the prevalence of software increases, so does the complexity, as well as the number of requirements that are derived for modern software projects [1]. Requirement prioritization is very important in the agile world, but as the requirement is prioritized keeping in mind the user, sometimes situation arises when the conflicts arises between the developer and the user as to which requirement to implement in the coming sprint and most of the times project get fails as the conflicts does not get solved

or the developer built the software which is user unlike.

## 2. Background

In the studied research paper the author has focused on the need to prioritize the requirements in the software development process. The found out that the existing practical methods of requirement prioritization are very complex and difficult to implement, more they mentioned that informal methods save time and are easier to apply but they may not be suitable for the practical scenarios because they lack the structure and consistency required to properly analyze the requirements. In this paper they have proposed an approach to quantify the quality of requirements to provide the measurement that is representative of all quality criteria identified for a specific software project. [2]

In the paper author has focused on the different techniques used by the companies for requirement prioritization in agile methodologies of software development. The author has interviewed the 8 different company's members and found out the different methods of prioritization in agile methodologies. The author showed that the developers point is also very important in requirement prioritization as the client is not always correct in the requirement need, because sometimes there is possibility that client is totally new to the IT world and does not know anything about it, so he asks for the features which cannot be built, so developer has to take that consideration in mind and check out that which requirement can be built, as developer always want the good for his company, he will never say yes to that requirement which cannot be fulfilled by his company. [4]

In the following research paper the author said that requirement prioritization aims at

ranking the requirements so as to trade off user priorities and implementation constraints, such as technical dependencies among the requirements and necessarily limited resources allocated to the project. In the research paper the author have used the interactive genetic algorithm to produce a requirement ordering which complies with the existing priorities, satisfies all the technical constraints and it also takes into the account the relative preferences elicited from the user. [3]

## 3. Proposed Methodology

In this section we will represent the approach which is developed for reducing the disagreement factors between the client and the developer during the process of requirement prioritization in the agile software projects.

The proposed methodology is the hybrid approach based upon the requirement prioritization using interactive genetic algorithm [3] and on the quality based requirement prioritization framework which uses binary inputs [2].

The purpose of our application which we have proposed to develop is to effectively gather software requirements from the customer and prioritize them accordingly by reducing the disagreement factor between the client and the developer. We have proposed to implement this prioritization on the basis of an interactive Genetic Algorithm according to which the requirements could be elicited in 2 ways i.e. simple text-based story-board form and graphical form where the user can exhibit the requirements by drawing use case diagrams on a customized graphical editor through user control toolbox.

After the proposed software requirements are gathered from the customer, they are evaluated on the basis of quality attributes and sub-attributes like Project Type, Scope etc. in order to calculate the desirability values on the basis of which, they are prioritized [2]. After prioritization, we take the user's input in relation to their expected prioritization and try to compare the prioritization of requirements from the developer and customer's perspective [3]. The overall objective of the application is to minimize the disagreement counts that arise from the difference in prioritization of requirements from the developer's and customer's perspectives.

#### 4. Conclusion and Future Work

The proposed approach attempts to quantify the quality of requirements to provide a measurement that is representative of all quality criteria identified for a specific software project. The derived quality measurement can be easily computed to serve as the main metric for requirements prioritization. After prioritizing requirements according to quality based approach, we will use an Interactive Genetic Algorithm to produce a requirement ordering which complies with the existing priorities, satisfies the technical constraints and takes into account the relative preferences elicited from the user. The approach developed is really simple and easy to understand and can be effectively used in the case of conflicts. In our future work we will conduct more experiments in alternative settings and on other case studies to corroborate our findings [3]. We will also try to take our application to the cloud.

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