INTRODUCTION

Agile methodologies have played a crucial role in software development success in recent years as compared to heavy weight methodologies. Because many organization report the inability of traditional development methods to handle the scaling as well as increased software complexity during software delivery and it affects the quality features so there is an urgent need to respond quickly to these functions and problems. There are many projects that can achieve their goals in terms of cost, time and quality [1]. As our research aim is to look for agile software quality performance indicators, this paper has put more stress on quality metrics and to analyze them in order to deliver better results. In traditional development methods like waterfall model, spiral model, incremental model etc., at the end of each phase, there were reviews like design review, code review and inspections so that faults can be identified as soon as possible and can be amended to recover the quality of the product. At present, many organizations have moved from traditional software development to modern development, in this case outdated quality assurance techniques are not appropriate for modern development as modern development have objectives which are iteration oriented and traditional development was stage oriented. Agile software development gives more stress on association of teams as well as direct communication for iterations & daily team activities. Several large organizations are accepting agile methodologies because these methodologies support flexibility, welcome changes at any stage, light documentation and the challenge here is for large organizations to attain these features as well as to follow quality [1, 2, 3, 10]. A novel approach is introduced to assess the quality of performance of any agile software project using the Fuzzy Inference System.

BACKGROUND

Information from the review has been collected almost the various tools which are used to measure the agile performance and predicts the quality of the system to be planned. Tools have been defined for measuring the quality [8]. Some authors collected the present thinking of agile metrics and proposed fundamental tools to measure them [3]. Tools have been suggested for assessing the time to build software and to measure its ideal engineering and story points [2]. Certain tools combine the present standing methods and provided alternative of these [1, 9]. Agile centered analytical tool 4-
DAT is developed and useful to diverse products [13]. A small number of authors sketch the model for agile software quality and its management [7].

The last argument of our analysis talks about some comprehensive analysis of agile which are accepted by different authors. Thorough evidence on agile has been delivered in terms of where it is used, which methods of agile have been used the maximum, how agile is paying to the research field and about tools of diverse practices of agile [4]. They have inspected the present state of agile metrics, collected qualitative information from different stakeholders, adoption of metrics into agile domain, in what way they affect performances of software problems and challenges confronted by agile, several kinds of studies on agile and how they met the definite standards for software [10,12]. Certain authors described about the agile and quality and also described the kind of work is done for achieving quality and provided with some examples [5,11].

**AGILE SOFTWARE QUALITY OF PERFORMANCE RISK EVALUATION**

In this study, agile software quality performance risk is evaluated. Figure 1.0 shows the overall process of the study. Through detailed literature review, quality of performance indicators identified which plays major role in agile software quality performance [8, 11]. The list of indicators is shown in Table 1.0, five indicators are identified. Further these indicators are Fuzzified with the qualitative value LOW, MEDIUM and HIGH. These qualitative value membership ranges from 0 - 1. There are 12 quality of performance rule base is created to work with the fuzzy inference system, which is based on the available literature and agile software expert’s opinion [11, 13]. Table 2.0 shows the rule base whereas inputs (quality indicators) and outputs (quality of performance) values are given in qualitative manner. Figure 2.0 shows the Fuzzification process, whereas the qualitative values hold the degree of membership. In given figure 2.0 qualitative value LOW holds the values 0-0.4 with membership degree 0-1, medium holds the values 0.1-0.9 with membership degree 0-1 and HIGH holds the values 0.6-1.0 with membership degree 0-1. Figure 3.0 shows the relation between fuzzy inference system rule base and agile software quality of performance indicators [6]. Figure 4.0 shows the fuzzy inference editor where the rule base is applied and formed a fuzzy inference system. Fuzzy inference system aggregated the rules and Defuzzification is done to evaluate the quality of performance crisp value. Finally the quality of performance risk can be evaluated by the equation.

\[ QOPR = 1 - QOP \]  \hspace{1cm} \text{Eq. 1.}
DISCUSSION & RESULT

Fuzzy Inference Rule Base editor produce the Rule View display which is shown in Figure 5.0, the vertical line on each input indicators decide the input value setting the vertical line of input indicators on different points. In this study 10 input/output samples are taken from the fuzzy inference system rule view for the analysis of performance quality of the developed agile software. Table 3.0 shows the result sample, the lowest Quality of Performance value (0.289) occurred whereas 4 indicators out of 5 have the lowest value. The highest value of quality of performance is 0.848 whereas the Integrity (ITG), Reliability (RLB) and Usability (USB) indicators has the high value; rest two indicators Efficiency (EFC) and Testability (TST) have the medium value. Figure 6.0, shows the Quality of Performance and related risk on the basis of quality of performance indicators crisp value. Therefore this study will help to agile program managers to take the decision precisely regarding the agile software project whereas inputs are not available in quantity.
CONCLUSION AND FUTURE WORK

This study may prove very decisive for the agile software performance quality assurance with the help of novel approach of Fuzzy Inference System. This is the era of agile methodology, because software industries shifting from the traditional methodology towards agile methodology. The quality indicators values are always qualitative (low, medium, high) in nature. Therefore this is very confusing to take any precise decision on the basis of these indicators, but with the help of this study these qualitative values can be converted into crisp form. In this study quality of performance and quality of performance risk is evaluated in the quantifiable manner whereas quality of any product or risk value always occur in qualitative manner (low, medium, high). With the help of this approach it is possible to predict the computable values of uncertain software important factors. The created rule base and indicators plays an important role to assess the quality of performance and related risk. In future number of rule can be enhanced and few more quality of performance indicators can be identified for the more precise prediction about the Agile Software Quality of Performance and associated risk with it.

REFERENCE


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