An improvement of Interactive Priorization Technique for Requirements Interdependency in prioritization process

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Abstract—Requirement Prioritization (RP) was introduced as a solution to the project with huge number of requirements by eliminating some of the requirements based on fair judgement in terms of priority value or rank made by expertise or stakeholder or both parties depending on the technique's specific operation. Along with the RP concept, there is another concept that must be deeply understood, which is Requirement Interdependencies (RI), which describes the interdependencies of requirements with each other. However, not many RP techniques involve the RI element during the RP process, citing complexity as the key reason for this, even though the RI element plays a critical role in determining the most important requirement for improving the project success rate. This paper describes the propose technique, which improves the RP process while considering the RI element. Two conventional RP techniques, Three level-Scale and Rank Ordering. Each RP technique plays an important part in producing high accuracy results while improving the impact of RI element during the RP process.

Keywords— Requirements Interdependencies, Requirements Prioritization, Eisenhower Matrix, Three level-Scale, Rank Ordering, Interactive Prioritization Technique

I. INTRODUCTION

This article propose technique for improving the chosen RP technique, Interactive Prioritization Technique, that is to increase the impact related to RI elements. RP is a process that assists in determining which requirements are more important [1], [2]. Various RP techniques are proposed to execute the best priority process possible. However, most techniques do not consider the requirements constraint during the RP process. Consequently, it will have an impact on the interdependencies needs. Requirements interdependencies is to consider how requirements correspond to each other and how this affects numerous operations within the software development process [3]. During development, dependencies between requirements may influence numerous decisions and activities [4]. Existing studies indicate that not considering requirements interdependencies can negatively influence project success [5]. Therefore, by conducting research about this issue, potential solution is proposed with the goal of resolving the highlight problem while consider the accuracy of RP result.

II. LITERATURE REVIEW

Every year, the number of RP techniques available increases, and each one differs from the others. After careful consideration, four RP techniques are selected as the primary resources for this study: Interactive Prioritization Technique (IGA), Three Level-Scale, Rank Ordering, and Super Decision Software (SDS). Details on the RP techniques discussed in the following subsection:

A. Interactive Prioritization Technique (IGA)

IGA is a RP technique produced by Palma Francis [6] that employs a genetic algorithm(GA) as the primary mechanism during the RP process. GA is used to generate requirement Disagreement values by population. The population is the group of requirements produced by the pair-wise comparison process used to determine the actual order based on Priority (Prio) and Dependency (Dep) graphs. IGA is another RP technique that does not neglect the RI element throughout the RP process.

Next, Disagreement values are produced from ties between requirements. Tie is an abbreviation for a circumstance in which more than one pair of requirements within a similar population have the same order. To break the ties, IGA devise a technique that include the participation of stakeholders as additional input. Stakeholders must complete the form, which is basically a form for comparing the pair of requirements. The form's output is new data that includes stakeholder perspectives.

The application of GA during the RP process is undoubtedly solid given GA's reputation for producing optimized results. However, IGA is unlikely to fully implement the entire capabilities of the RI element, but rather to demonstrate the relationship between its requirement to lessen the strain during the RP process.

B. Three-level Scale

This technique consisted of *The four-quadrant 'Eisenhower Decision Matrix,* in which every requirement was classified as either important to achieving business objectives or not so important, and as either urgent or not so urgent, and for this scale to be beneficial, stakeholders had to have mutual understanding on what each level in their scale meant [7]. This technique is normally used for business