



“Various Approaches of Requirement Engineering and Comparisons among These Approaches”

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Abstract: Requirements engineering is the foundation of software engineering, and quality of requirements engineering determines the quality of projects. In order to fulfill user's requirement, it is very important to manage user's requirement effectively. There are many approaches to gather user's requirement. In this paper we discuss about various approaches of requirement gathering in requirements engineering and comparison among them on the basis of various parameters like reusability, scaling, integration, non-conflicts, etc.

Keyword: Reusability, Scaling, integration, non-conflict, effectively, approaches

I. INTRODUCTION

Requirement engineering is the most effective phase of software development process. It aims to collect good requirements from stakeholders in the right way. It is important for every organization to develop quality software products that can satisfy user's needs. Requirements engineering for software development process is a complex exercise that considers product demands from a vast number of viewpoints, roles, responsibilities, and objectives. Therefore, it becomes necessary to apply requirement engineering practices in every phase of software development process” [2]. There are many techniques to obtain requirements from customers. Selecting the right techniques according to the characteristics of the project is very important. In some complex problems, combination of requirement engineering techniques should be applied for efficient and successful requirement engineering process. [3]. Requirement engineering is a crucial activity, which can affect the entire life cycle of software development project. The main objective of requirement engineering is to collect requirements from different viewpoints such as business requirements, customer requirements, user requirements, constraints, security requirements etc. [5].

The researchers gradually realize that the requirements engineering processes are very complex and the related requirements are in a great variety. Thus, in order to analyze and compare different types of requirements engineering approaches more deeply, a simple, clear, unified description method of requirements engineering process is needed [6]. Object oriented requirement engineering aims at applying Object oriented thoughts to traditional requirement engineering. The optimization and improvement of traditional requirement engineering should be according to the continuous changes of requirements. Within the context of software engineering, the term method has been defined as an explicit prescription for achieving a set of activities required by an approach to software development. [11]

II. APPROACHES FOR REQUIREMENT ENGINEERING

a. Object-oriented approach to requirement engineering:

For Applying modeling and OO technologies to requirement phases, the domain knowledge can be captured in a well-defined model, so the completeness, consistency, traceability and reusability of requirement and its integration with the artifacts of other phases can be cost effectively improved [9]. Object orientation is an approach that models a system as a group of interacting objects. Each object represents some entity of interest in the system being modeled, and is characterized by its classifier, its state (data elements), and its behavior. In object oriented framework, requirement specifications are specified as *Requirement Object*. [10]

b. Service-oriented approach to requirement engineering:

Service-oriented computing has received significant attentions recently, and many applications are being developed by using this approach. Service-oriented requirement engineering (SORE). SORE focuses on modeling, specifying, and analyzing application requirements for software that will be developed in a service-oriented manner running in an SOA infrastructure

c. Goal-oriented / Incremental approach to requirement engineering:

The Goal Oriented Requirements Engineering method identifies the requirements in terms of goals which are well understood by the stakeholders and the goals are generally extracted from the stakeholders. But extracting these goals is a challenging task in the goal oriented methods [8]. Goal-Oriented requirement engineering (GORE) provides an incremental approach for elicitation, analysis, elaboration & refinement, specification and modeling of requirements [4]

d. Reverse Engineering approach to requirement engineering :

The aim of reverse engineering is to draw out many kinds of information from existing software and using this information for system renovation and program understanding. Based on traditional practice, reverse engineering and requirements engineering are two separate processes in software round trip engineering. , it is possible to have a better requirements elicitation, and clear understanding of what is redundant, what must be retained and what can be re-used.[7]

e. The bio-inspired approach to requirement engineering:

The bio-inspired approach is used in requirement engineering for the transformation of user requirements into system requirements using a probabilistic distributed computing model with abstraction coefficients, amalgamation factors and clarity factors [1]

f. Traditional approach to requirement engineering:

In traditional approach to requirement engineering, requirements are unorganized, having conflict or ambiguous, not scaled and not managed effectively, so we face many problems in integration of requirements. To overcome these problems we have to look to another approaches.

A. Requirement Engineering Approaches:

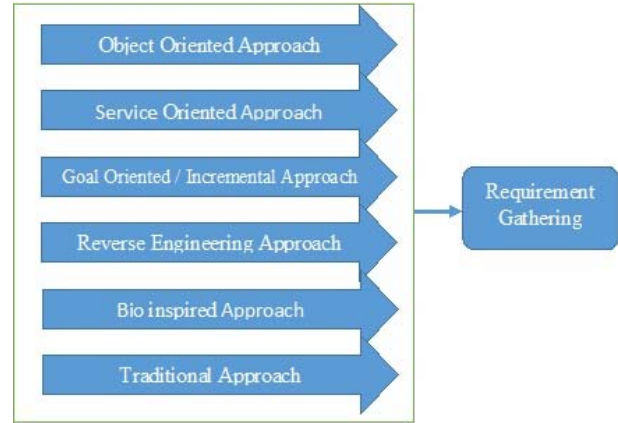


Figure: 1

III. COMPARISON AMONG THESE APPROACHES

The comparisons among the various approaches is based on the data collected from some organization & engineering students. We have calculated parameters as very low, low, high & very high. These are marked as 0, 1, 2 & 3 respectively. Total marks are calculated in table 1. As per our observation Object oriented approach is better than other approaches.

Table: 1

Parameter Approach	Reusability	scaling	Integration	Non Conflict	TOTAL
Object Oriented Approach	High [2]	Very High [3]	Very High [3]	High [2]	10/12
Service Oriented Approach	Low [1]	High [2]	High [2]	High [2]	7/12
Goal Oriented Approach / Incremental approach	Low [1]	High [2]	High [2]	High [2]	7/12
Reverse Engineering Approach	Very High [3]	Low [1]	Low [1]	Low [1]	6/12
The bio-inspired approach	Low [1]	Low [1]	High [2]	Low [1]	5/12
Traditional Approach	Low [1]	Low [1]	Low [1]	Low [1]	4/12

IV. CONCLUSION

All approaches resolve a paradox of requirements engineering -the need to formulate a clear vision of a system in a world of constantly changing requirements. In all the approaches as per our observation object oriented approach is better than others on reusability of requirement, scaling of requirement, integration of requirement and non-conflict requirement parameters.

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