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REQUIREMENT ENGINEERING PRACTICES FOR EFFECTIVE SOFTWARE DEVELOPMENT

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ABSTRACT: Requirement engineering is the most important tools and technique for software development. It is important for every organization to develop good quality requirement engineering practices for designing quality software product. Requirement engineering is a process in which we collect the user's requirements in right way and implement them to software development process and produce quality software product that satisfy the customer's need.. To achieve this goal we have to apply requirement engineering practices in every step of software development process. In this paper, we analyze the basic issues and Impact of requirement engineeringpractices in designing quality software products

INTRODUCTION: Requirement engineering (RE) is a process of providing user requirements that can be further used to implement in software development. The success of system development depends upon the fitness for the needs of its users and business environment. Many researchers have already presented their research work on requirement engineering practices. From literature survey, we found that the carefully identified and extracted software requirement is a key issue for project success. At the same time, the cost of correcting an error after delivering the system is an order of magnitude higher than the cost of correcting a similar error during the requirement analysis phase. Since requirement often change during development, it is important to control the changing requirements. The success of the organization-wide adoption of requirement engineering practice depends on human, social, cultural, global, personal, organizational,technological, and economical issues.

1. DIMENSIONS OF RE

In this section we present the overall framework within which requirement engineering takes place. The result of the requirements engineering phase is documented in the requirements specification. The requirements specification reflects the mutual understanding of the problem to be solved between the analyst and the client. The requirements specification serves as a starting point for the next phase, the design phase. To achieve well-defined document containing the user requirements that satisfies these prerequisites, we can distinguish three processes in requirements engineering. Several classifications have been proposed for requirements engineering:

- Requirement elicitation.
- Requirement specification.
- Requirement verification and validation.

Requirements elicitation

Requirements elicitation is about understanding the problem. In general, the requirements analyst is not an expert in the domain being modeled. Through interaction

with domain specialists, he has to build himself a sufficiently rich model of that domain. The fact that different disciplines are involved in this process complicates matters. In many cases, the analyst is not a mere outside observer of the domain modeled, simply eliciting facts from domain specialists.

Requirements specification

Once the problem is understood, it has to be described in the requirements specification document. This document describes the product to be delivered, not the process of how it is developed.

Requirements validation and verification

Once the problem is described, the different parties involved have to agree upon its nature. We have to ascertain that the correct requirements are stated (validation) and that these requirements are stated correctly (verification).

2. RE TOOLS & TECHNIQUES

The principles of requirement engineering described above are valid and important, but for practical application additional specifics are needed. These specifics are provided by methods and tools. A method, sometimes referred to as a methodology, describes a general approach; a tool, usually but not always automated, provides a detailed, step- by-step approach to carrying out a method.

Methods

Process-oriented methods take the primary viewpoint of the way the system transforms inputs into outputs, with less emphasis on the data itself and control aspects. Data-oriented methods emphasize the system state as a data structure. Structured analysis and design techniques and the real-time extensions to structured analysis are secondarily control oriented. Flowcharting is primarily process oriented. Finally, object-oriented methods base requirements analysis on classes of objects of the system and their interactions with each other.

Tools

The number of tools that support requirements engineering is growing rapidly, and even the most cursory survey is beyond the scope of this paper. Classified requirements tools as follows:

- Graphical editing and Traceability
- Behavior modeling
- Databases and word processing

3. USEFULNESS OF RE PRACTICES IN SOFTWAREDEVELOPMENT

Software development begins with the recognition of users need followed by a sequence of activities which are performed step by step:

Feasibility analysis

Feasibility analysis is the first phases in the development of a new system. This phase starts when the user faces a problem in the current system.

System analysis and project planning

This phase includes studying of exiting system in detail and collecting data in order to

find out the requirement of the user.

Program design and coding

After successful completion of requirementanalysis and planning, the system analyst focuses on the design of system as per user requirements. When the design is accepted by the concern users, the analyst begins developing the software

System testing and operations

In this phase, whole system is tested with different techniques to ensure that the software is bug free. Although, during testing phase, the programmers must test their programs whether it is fulfill user requirementor not? **A**fter testing, the system is installed at the user‟s place and implemented.

4. RECENT RE PRACTICES

Recent requirement engineering is described in following table:

Table 1: The recent requirement engineeringpractices

Focus area	Best practices	Key benefits
Knowledge	Involve customers and users throughout RE	Better understand ofreal needs
Resources	Maintaininggood relationshipamong stakeholders	Better satisfy customer needs
process	Priorities requirements	Focus attentionon the most important user needs

Elicitation, analysis and validation are at the heart of the requirements engineering process. A careful process of study, understanding and analysis of requirements is necessary to deal with the complexities of the requirements elicitation. A validation procedure is essential to make sure if the right requirements are elicited and these requirements are met by the built system to fulfill the objectives.

5. FUTURE RESEARCH DIRECTIONS ON RE

The major objective of future research direction on requirement engineering is to improve the RE process. Future research project on requirement engineering aims to show that quality requirements will follow when the RE process supports the following:

- The effectiveness of requirement engineering practices for S/W development processes and the impact of requirement engineering practices in SDLC phases.
- Analyzing the security and information requirement engineering for an organization.
- Analyzing and extracting useful information according to the business and technological needs for an organization and define a planning phase for the requirement engineering process.

6. CONCLUSION

Many of the most common, most serious problems associated with software development are related to requirement. Begin from the introduction, we discussed the requirements engineering and its dimension, then talk about requirement engineering tools, and usefulness of requirement engineering practices in software development and finally we analyzed the recent requirement engineering practices and at last we explore the future research directionon requirement engineering and conclude this paper.

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