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A Survey of Requirement Engineering Practices in Software Development

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Abstract

Requirement Engineering is process of formulating, maintaining, and documenting software requirements. Requirements are given by the User of the system, according to that engineers will develop the system. Requirement Engineering deals on Functional and Non Functional requirements. Functional and Non Functional requirements are the work as bricks to support software edifice. Finally, design, implementation and testing add stories to construct entire software tower on top of this foundation. For this purpose, requirement engineers come across with numerous challenges to develop successful software. Requirements engineering is an iterative process.

KEYWORDS: Requirement Engineering-RE, Elicitation, Analysis, Validation, Management.

1.INTRODUCTION

If software requirements are not right, engineers will not end up with software what they need. Right requirements are gathered by W5H principles. WHAT- what are the various levels and types of requirements are needed, do's and limitation of the software. The hardest part of building a software system is deciding precisely what to build. WHY- benefits of having right software. WHO- who are the users of the system, stakeholder getting involved in process. Three main stakeholders are Acquirer, Supplier of the software product, other stakeholders. WHEN- when the requirement activities should take part in Software life cycle. WHERE- place where software going to work, environment of the software. HOW- techniques for Requirement Engineering. Levels of requirements are USER LEVEL, BUSINESS LEVEL, and PRODUCT LEVEL. USER LEVEL deals with functionality of the software product from the user's perspective. They define what the software has to do. BUSINESS LEVEL deals with business problem and rules. PRODUCT LEVEL deals with

constraints, requirements, specification of the system.

2. REVIEW OF LITERATURE

[1] Show outline of the field of Software system Requirement Engineering. Describe main area of Requirements Engineering practices. Shows what is common and varies across in different types of Software system.

[2] Gives challenges and crisis of Requirements Engineering. Requirement engineering process, system requirements, and application encounter all major challenges. Gives comparison between different techniques, represent a framework that illustrate the challenges.

3. TECHNIQUE

3.1 Requirements Elicitation

Requirements elicitation is the practice of collecting the requirements of a system from users, customers and other stakeholders. The practice is also sometimes referred to as requirements gathering. Sometimes requirements elicitation called requirements discovery. Discovering requirements involves technical staff working with customers to find out about the application domain, the services that the system should provide and the system's operational constraints.

Stakeholders are end user, manager, engineers involved in maintenance.

Requirement Elicitation involves

- Requirement discovery.
  Interacting with stakeholders to discover their requirements. Domain requirements are also discovered at this stage.

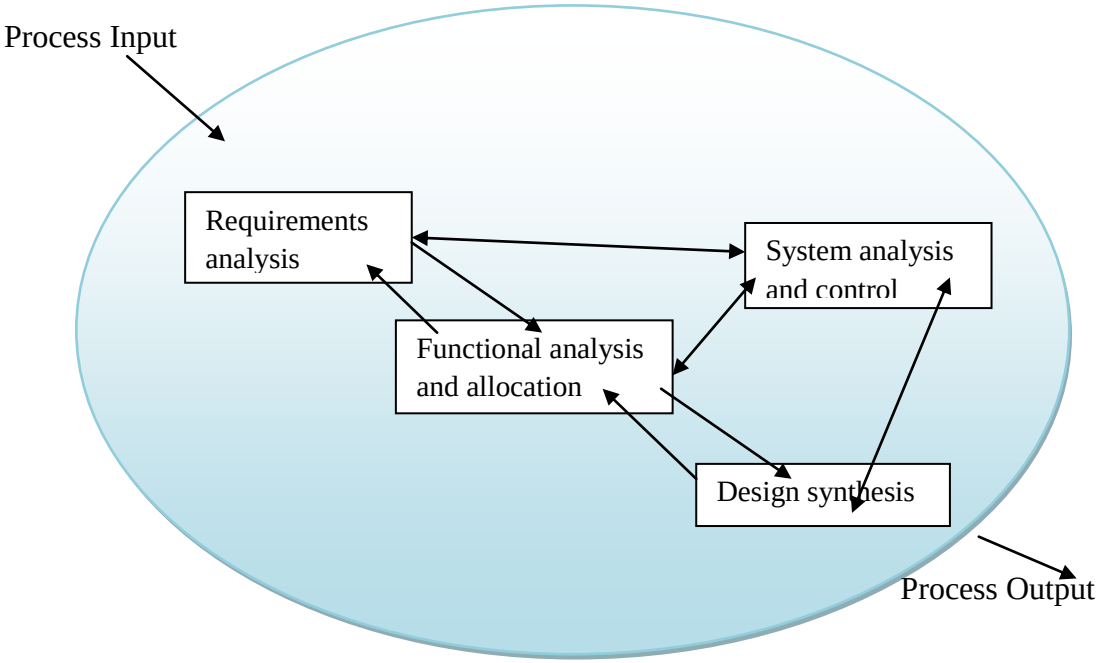
- Requirements classification and organization.
  Grouping related requirements and organizing them into coherent cluster.

- Requirements prioritization and negotiation.
  Prioritizing the requirements and resolving their conflicts.

- Requirement documentation.
  Requirements are documented and input to next phase.

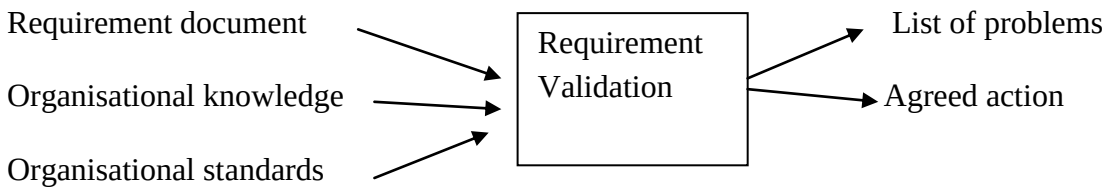
3.2 Requirements Analysis

Requirements analysis is the first stage in the systems engineering process and software development process. It encompasses task that go into determining the needs or conditions to meet for a new or altered product, taking account of the possibly conflicting requirements of the various stakeholders, such as beneficiaries or users. Requirements analysis is critical to the success of a development project. Requirements must be actionable, measurable, testable, related to identified business needs or opportunities, and defined to a level of detail sufficient for system design. Requirements can be functional and non-functional. Requirement Analysis specifies software characteristics, indicate software interact with other system, establish the constraints that software must meet. It categories and organises them into related sub set, explore the relationship between requirements. Examine requirements consistency, omission and ambiguity. Prioritizing the requirements based on customer need.



3.3 Requirements Validation

Requirement Validation is an activity in which requirement specification is analysed in order to ensure that the requirements are specified unambiguously. If any inconsistencies, omissions and errors are identified then those are corrected or modified during validation. The most commonly used requirement validation mechanism is Formal Technical Review (FTR). In FTR, the review team validates the software requirements. The review team consists of requirements engineers, customers, and users, marketing person and so on, this review team basically identifies conflicting requirements, inconstancies or unrealistic requirements. Validation work with a final draft of the requirements document. Requirement document checks for completeness, consistency, technical errors, ambiguous of requirements.



Validation Input

Requirements document

- Should be a complete version of the document, not an unfinished draft. Formatted and organized according to organizational standards

Organizational knowledge

- Knowledge, often implicit, of the organization which may be used to judge the realism of the requirements

Organizational standards

- Local standards e.g. for the organization of the requirements document

Validation Output

Problem list

- List of discovered problems in the requirements document

Agreed actions

- List of agreed actions in response to requirements problems. Some problems may have several corrective actions; some problems may have no associated actions.

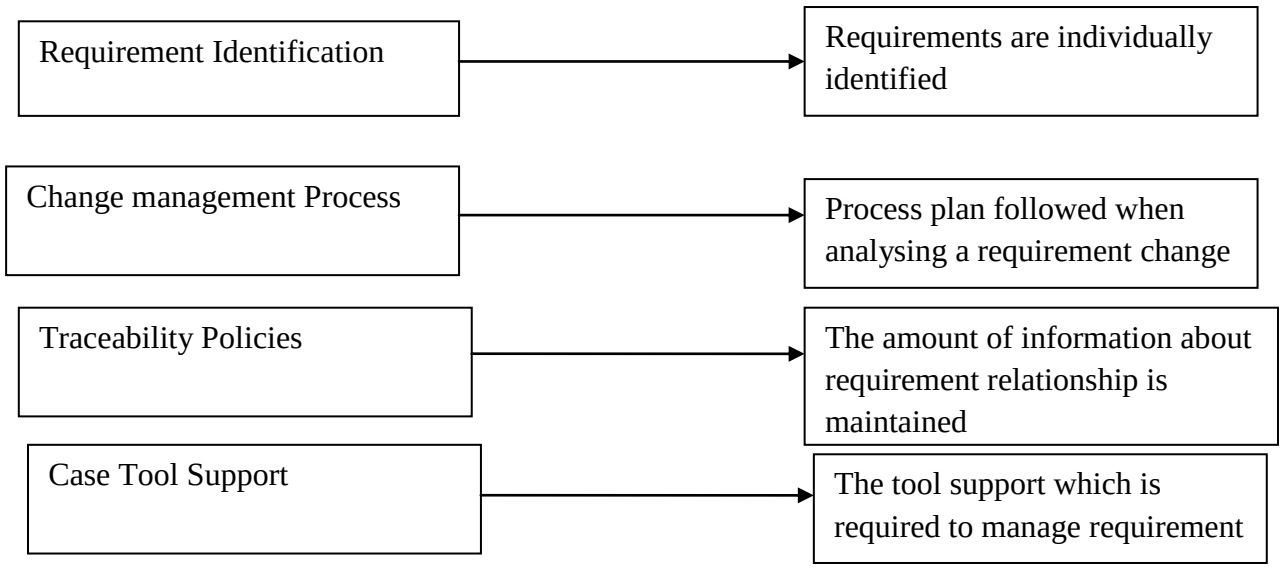
3.4 Requirement Management

Requirement Management is the process of managing changing requirements during the requirements engineering process and system development.

Why requirements get change?

- Requirements are always incomplete and inconsistent. New requirements occur during the process as business needs change and a better understanding of the system is developed.
- System customer may specify the requirements from business perspective that can conflict with end user requirements.
- During the development of the system its business and technical environment may get changed.

Requirement Management Process



Case tool support required for Requirement storage, Change management and Traceability management.

4. RESULT

We discussed the state of the art of requirements engineering for Software Systems. We focused on requirements engineering activities namely requirements elicitation, requirements analysis, requirements validation and requirements management, as a basic discipline in developing Software Systems.

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