SOFTWARE ENGINEERING-I

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Week 6

-S/W Requirements

-Types of Requirements.

-Requirements Gathering Process

S/W Requirements

- The software requirements are description of features and functionalities of the target system.

- Requirements convey the expectations of users from the software product.

- The requirements can be obvious or hidden, known or unknown, expected or unexpected from client's point of view.

Requirement Engineering

- The process to gather the software requirements from client, analyze and document them is known as requirement engineering.

Requirement Engineering Process

- It is a four step process, which includes –
  - Feasibility Study
  - Requirement Gathering
  - Software Requirement Specification
  - Software Requirement Validation

Feasibility study

- When the client approaches the organization for getting the desired product developed, it comes up with rough idea about what all functions the software must perform and which all features are expected from the software.

- Referencing to this information, the analysts does a detailed study about whether the desired system and its functionality are feasible to develop.

- This feasibility study is focused towards goal of the organization. This study analyzes whether the software product can be practically materialized in terms of implementation, contribution of project to organization, cost constraints and as per values and objectives of the organization.

- The output of this phase should be a feasibility study report that should contain adequate comments and recommendations for management about whether or not the project should be undertaken.

Requirement Gathering

- If the feasibility report is positive towards undertaking the project, next phase starts with gathering requirements from the user.

- Analysts and engineers communicate with the client and end-users to know their ideas on what the software should provide and which features they want the software to include.

Software Requirement Specification (SRS)

- SRS is a document created by system analyst after the requirements are collected from various stakeholders.

- SRS defines how the intended software will interact with hardware, external interfaces, speed of operation, response time of system, portability of software across various platforms, maintainability, speed of recovery after crashing, Security, Quality, Limitations etc.

- SRS should come up with following features:
    - User Requirements are expressed in natural language.
    - Technical requirements are expressed in structured language, which is used inside the organization.
    - Design description should be written in Pseudo code.
    - Format of Forms and GUI screen prints.
    - Conditional and mathematical notations for DFDs etc.

Software Requirement Validation

- After requirement specifications are developed, the requirements mentioned in this document are validated. User might ask for illegal, impractical solution or experts may interpret the requirements incorrectly. This results in huge increase in cost if not nipped in the bud. Requirements can be checked against following conditions -
    - If they can be practically implemented
    - If they are valid and as per functionality and domain of software
    - If there are any ambiguities
    - If they are complete
    - If they can be demonstrated

Requirements Gathering Process

- Requirements gathering process to find out the requirements for an intended software system by communicating with client, end users, system users and others who have a stake in the software system development.

- There are various ways to discover requirements
  - Interview
  - Survey
  - Questionnaires
  - Task analysis

Interviews

- Interviews are strong medium to collect requirements. Organization may conduct several types of interviews such as:
  - Structured (closed) interviews, where every single information to gather is decided in advance, they follow pattern and matter of discussion firmly.
  - Non-structured (open) interviews, where information to gather is not decided in advance, more flexible and less biased.
  - Oral interviews
  - Written interviews
  - One-to-one interviews which are held between two persons across the table.
  - Group interviews which are held between groups of participants. They help to uncover any missing requirement as numerous people are involved.

Surveys

- Organization may conduct surveys among various stakeholders by querying about their expectation and requirements from the upcoming system.

Questionnaires

- A document with pre-defined set of objective questions and respective options is handed over to all stakeholders to answer, which are collected and compiled.

- A shortcoming of this technique is, if an option for some issue is not mentioned in the questionnaire, the issue might be left unattended.

Task analysis

- Team of engineers and developers may analyze the operation for which the new system is required.

- If the client already has some software to perform certain operation, it is studied and requirements of proposed system are collected.