LECTURE 12

Software requirements Engineering

Requirements validation and techniques

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Requirements Validation Techniques

- Requirements Validation Techniques are used to ensure that the software requirements are complete, consistent, and correct.

What is Requirement Validation?
- Requirement validation is the process of checking and confirming that the requirements defined for development accurately capture the needs and expectations of the stakeholders.
- So now you know it's a systematic approach ensuring the requirements are clear, unambiguous, verifiable, and achievable. Let us look into an example.
- Say, a stakeholder wants an e-commerce platform that allows customers to search for and purchase products quickly. If the requirement is not validated properly, the development team may create a difficult-to-navigate platform or lack critical features.
- By validating the requirements, the development team can ensure that the platform meets the stakeholder's needs and expectations, resulting in a successful product.

- The output of requirements validation is the list of problems and agreed-on actions of detected problems.
- The lists of problems indicate the problem detected during the process of requirement validation.
- The list of agreed actions states the corrective action that should be taken to fix the detected problem.

Requirement Validation Techniques

Test Case Generation

- The requirement mentioned in the SRS document should be testable, the conducted tests reveal the error present in the requirement.
- It is generally believed that if the test is difficult or impossible to design, this usually means that the requirement will be difficult to implement and it should be reconsidered.

Prototyping

- In this validation technique the prototype of the system is presented before the end-user or customer, they experiment with the presented model and check if it meets their need.
- This type of model is mostly used to collect feedback about the requirement of the user.

Requirements Reviews

- In this approach, the SRS is carefully reviewed by a group of people including people from both the contractor organizations and the client side, the reviewer systematically analyses the document to check errors and ambiguity.

Automated Consistency Analysis

- This approach is used for the automatic detection of an error, such as non-determinism, missing cases, a type error, and circular definitions, in requirements specifications.
- First, the requirement is structured in formal notation then the CASE tool is used to check the in-consistency of the system,
- The report of all inconsistencies is identified, and corrective actions are taken.

Walk-through

- A walkthrough does not have a formally defined procedure and does not require a differentiated role assignment.

- Checking early whether the idea is feasible or not.
- Obtaining the opinions and suggestions of other people.
- Checking the approval of others and reaching an agreement.

Simulation

- Simulating system behavior in order to verify requirements is known as simulation.
- This method works especially well for complicated systems when it is possible to replicate real-world settings and make sure the criteria fulfil the desired goals.

Checklists for Validation

It employs pre-made checklists to methodically confirm that every prerequisite satisfies predetermined standards. Aspects like completeness, clarity and viability can all be covered by checklists.

Importance of Requirements Validation Techniques

1. Accuracy and Clarity

It makes sure that the requirements are precise, unambiguous and clear. This helps to avoid miscommunications and misunderstandings that may result in mistakes and more effort in subsequent phases of the project.

2. User Satisfaction

It confirms that the requirements meet the wants and expectations of the users, which helps to increase user happiness. This aids in providing a product that satisfies consumer needs and improves user experience as a whole.

3. Early Issue Identification

It makes it easier to find problems, ambiguities or conflicts in the requirements early on. It is more economical to address these issues early in the development phase rather than later, when the project is far along.

4. Prevents the Scope Creep

It ensures that the established requirements are well stated and recorded, which helps to prevent scope creep. By establishing defined parameters for the project's scope, requirements validation helps to lower the possibility of uncontrollably changing course.

5. Improving Quality:

It enhances the software product's overall quality. By detecting and resolving possible quality problems early in the development life cycle, requirements validation contributes to the creation of a more durable and dependable final product.