CM-2603 Data Science Group Project

Introduction To Requirement Engineering

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Learning Outcomes

- Covers LO1 for Module

- On completion of this lecture, students are expected to be able to:

    - Differentiate the requirements
    - Difference between functional and nonfunctional requirements.

CONTENT

- What is Requirement?
- What is Requirement Engineering?
- Types of Requirements
- Functional/Non -Functional Requirements
- What is Software Requirement Document?
- Requirement Engineering Processes

What is Requirements?

- The descriptions of what the system should do.

What is Requirement Engineering?

- The process of establishing the requirements.

  or

- The process of finding out analyzing , documenting and checking these services and constraints.

We can define the requirements as,

1. User Requirements
2. System Requirements

Types Of Requirements:

- **User Requirements (High level abstract requirement) :**

What services the system is expected to provide to system users.

- **System Requirements (Detailed description of what the system should do) :**

It is about more detailed descriptions of the software system's functions, services, and operational constraints. (Either functional or non functional)

Software Requirements are Classified as:

1. **Functional Requirements:**

   What services the system should provide , How the system should react to particular inputs and how the system should behave in particular situations.

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   Particular Inputs  →  Software System  →  Particular Outputs
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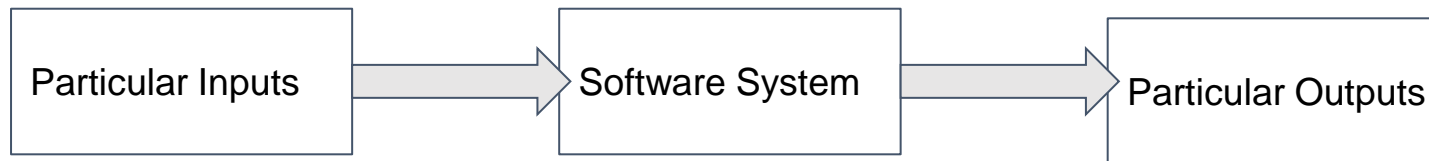
1. **Non-Functional Requirements:**

   These are the constraints on the services or functions offered by the system. Also failing to meet non-functional requirements can mean that the whole system is unstable.

   eg: Reliability , Response Time , Performance , Security , Availability , Time constraints

What is Software Requirement Document?

- It is an official statement what the developer should implement (Sometimes called as Software Requirement Specification).

- Should be included in user requirements and specification of system requirements.

- But in agile development, theses requirements change so rapidly. so that requirement document is out of date as soon as it is written. So the effort is largely wasted.

- Rather than formal document, approaches such as collect user requirements incrementally and write these on cards as user stories. Then user prioritizes the requirements for implementation in the next increment of the system.

Requirement Engineering Processes:

1. Requirement Elicitation

1. Requirement Analysis

1. Requirement Validation

1. Requirement Management

1. Requirement Elicitation

The process of gathering requirements by communicating with the customers is known as eliciting requirements.

Requirements Elicitation Techniques :

1. Stakeholder Analysis
2. Brainstorming
3. Interviews
4. Survey / Questionnaire
5. Interface Analysis

2. Requirement Analysis

Requirement Analysis is used by developers to understand,

- The functions of the application to be developed.

- what the client/user expects the application to do.

- The relative importance of each function of the system to the client/user.

- Describe the required interactions between the system and its environment.

- Helps to determine the quality of the requirements. It involves identifying whether the requirements are unclear, incomplete, ambiguous, and contradictory.

- **Requirements Analysis Techniques :**
    1. Business process modeling notation (BPMN)
    2. UML (Unified Modeling Language)
    3. Flowchart technique
    4. Data flow diagram

3. Requirement Validation

- It is the process of checking that requirements actually define the system that the customer really wants.
- During the requirement validation process, different types of checks should be carried out on the requirements in the requirements documents.
- Types of checks: Validity,Consistency,Completeness,Realism,Verifiability

- **Requirements Validation Techniques:**

  1. Requirements Reviews

  2. Prototyping

  3. Test case Generation

4. Requirement Management

- It is the process of understanding and controlling changes to system requirements. So need to keep track of requirements and maintains links between dependent requirements. So that you can access the impact of requirement changes.