About Requirements Identification

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Outline

- **Introduction**
  - **Scope of this presentation**
  - **Software engineering**
  - **Software development life cycle (SDLC)**
  - **SDLC phases**
- Requirement analysis and specification
  - Definition of Requirements
  - Activities of requirement analysis and specification
- About Requirement gathering

Scope of the Presentation

- The objective of this presentation is to introduce the concept "**Requirements identification**" to build a software system for any given enterprise/organization
- Typically, software is built by following **software development life cycle (SDLC)** which consists of several phases.
- **"Requirement specification and analysis"** phase is one of the step of SDLC.
- **"Requirement specification and analysis"** consists of three activities.
- **Requirements Identification is** one of the activity of "Requirement specification and analysis" phase of SDLC.
- This presentation is related to "**Requirements Identification"**

Need for Software Engineering

- Suppose you have a friend who asked you to build a small wall like figure shown if fig1.1
- But what if the same friend asked you to build a large multistoried building like figure shown if fig1.2
- Same rules for building a small wall are not applicable for building large building .
- For multistoried building Civil engineering principles are needed.
- Same way to build a large and efficient software Systems we need software Engineering Principles.

Fig. 1.1: A Small Wall

Fig. 1.2: A Multistoried Building

Software Engineering

- It is a discipline that adopts engineering approaches to develop large-scale software
- Engineering approach
  - established methodologies,
  - processes,
  - tools,
  - standards,
  - organization methods,
  - management methods,
  - QA systems, and the like
- Objectives
  - with high productivity,
  - low cost,
  - controllable quality,
  - and measurable development schedules.

Software Engineering cont…

- Software Engineering is useful to build software which is
  - Faster (Process)
  - Better (Product/Quality), and
  - More Efficiently (Project/Management)

Stakeholders in a software project

- Stakeholders are as follows
  - Customers: Fund a project, acquire a product
  - Users: Interact with a product
  - Requirements Analysts
  - Developers
  - Testers
  - Documentation writers
  - Project managers
  - Legal staff
  - Manufacturing
  - Sales, Marketing, Field support, Help desk,
- A software product developed with integrated effort of the above stake holders leads to
  - Exciting products
  - Delighted customers
  - Fulfilled developers.

Software development life cycle (SDLC)

- SDLC is a descriptive and diagrammatic representation of the all the software life cycle developmental activities, required to make a software product transit through its life cycle phases.
- SDLC captures the order in which these activities are to be undertaken.
- SDLC makes developing S/W Systematic and Disciplined manner.
- Commonly used SDLC models are as follows:
    - Classical Waterfall Model
    - Iterative Waterfall Model
    - Prototyping Model
    - Evolutionary Model
    - Spiral Model

Phases of SDLC

- The phases of classical waterfall model are as follows.
  - Requirements Analysis and Specification
  - Design
  - Coding and Unit Testing
  - Integration and System Testing
  - Maintenance

Phases of Waterfall Model

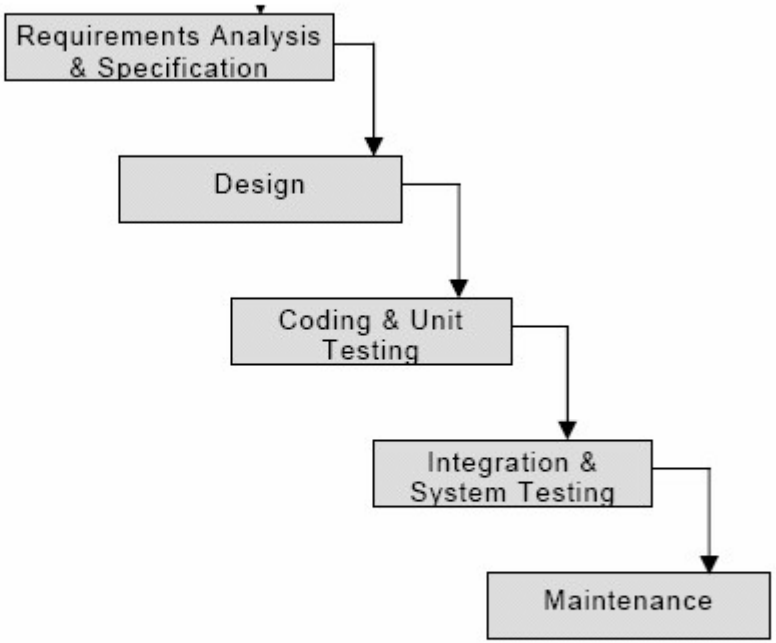

Fig 2.1: Classical Waterfall Model

Activities in each phase of the life cycle

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  - **Activities of requirement analysis and specification**
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Objective of “Requirement analysis and specification”

- The objective of this phase is to understand the exact requirements of the customer and to document them properly.

Requirements: Definition (IEEE 1990)

- Requirement is
  - a condition or capability needed by a user to solve a problem or achieve an objective
  - A condition or capability that must be met or possessed by a system or component to satisfy a contract, standard, specification, or other formally imposed document
  - A document representation of a condition or capability as above.
  - Users (stakeholders') view, Developers view
- Requirements are a specification of
  - what should be implemented.
  - How the system should behave,
  - They may be a constraint on the development process of the system

Activities of “Requirement analysis and specification” phase

- Requirement analysis and specification phase consists of the following activities
  - Requirements gathering and analysis
  - Evaluating
  - Requirements specification and documenting for a software or software-containing product

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Activity of “Requirements Identification”

- In the rest of the slides we only deal with requirement identification.

Requirements Specification Characteristics

- Complete
- Correct
- Modifiable
- Traceable

Benefits from a High Quality Process of Requirements Gathering

- Fewer requirements defects
- Reduced development work
- Fewer unnecessary features
- Lower enhancement costs
- Faster development
- Fewer misconceptions
- Reduced project chaos
- More accurate system testing estimates
- Higher customer and team member satisfaction

Requirements Engineering: Risks Involved

- Insufficient User involvement
- Creeping User Requirements
- Ambiguous Requirements
- Gold Plating
- Minimal specification
- Overlooked User classes
- Inaccurate Planning

Requirement gathering: Levels of Requirements

- Requirements engineering road map
  - Read research paper entitled “**Requirement engineering road map” (PDF flle is ICSE2000)**
- Information categories
  - Pls see the PDF file “**infoCategoriesCaseStudy**”
- Information gathering
  - Pls. see the PDF file “**infoGatheringSlides1**”
- Case study of hostel
  - Pls refer PDF file regarding **“reqIndetiHostel3”**