

13-6-2022

## Requirement

A requirement is a need, expectation constraint or interface of any stakeholder that must be fulfilled by the proposed software product during its development

## Role of Requirement



## Source of Requirement

- ① Stakeholder (Developer, Customer, End-user)
  - ② Document form / File
  - ③ Existing System (Improvement)
  - ④ Application Domain

## Engineering

It is a process purpose of converting the specification of customers into such artifacts that are used by artisans to produce the product that fulfill the customer specification.

## Requirement Engineering

The subset of system engineering concerned with discovering, developing, analysing, qualifying.

## Stakeholder

An individual group of people or group/ organization that has a direct or in direct interest in system.

## R.E. Activities

Requirement Inception → Elicitation

Requirement Development → Analysis

Requirement Management → Specification  
→ Verification

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## Types of Requirement

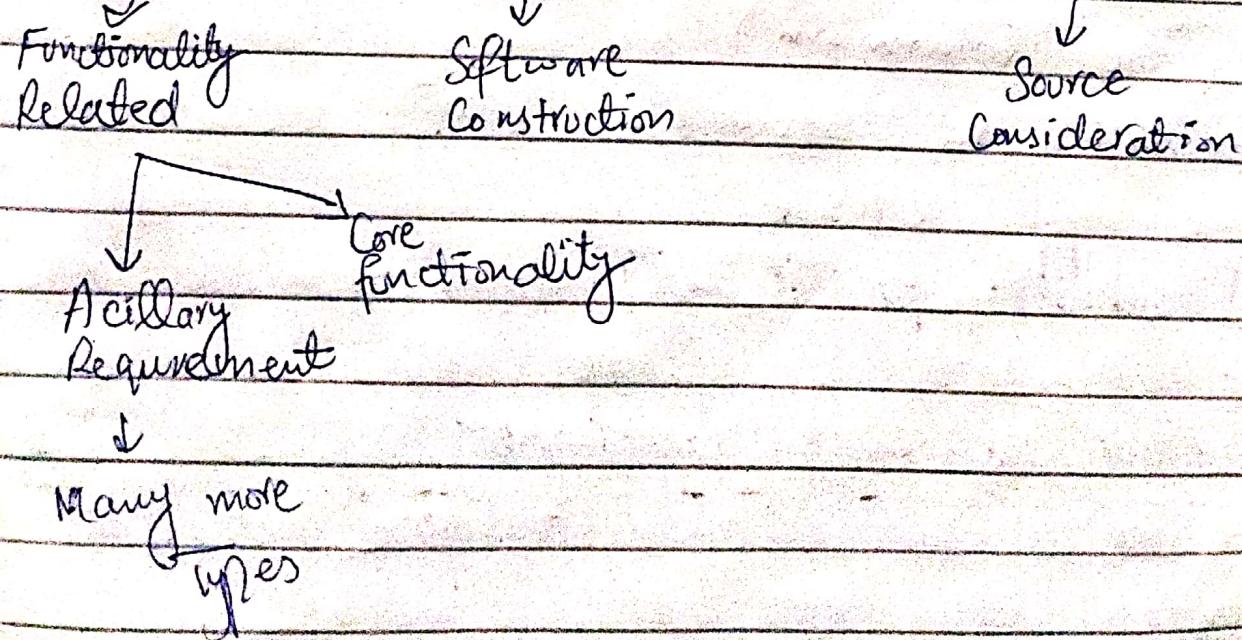
### Classification:

- ① Functionality Consideration - selected business para.
- ② Software / Product Construction - language font necessary to build
- ③ Source consideration - agencies that provide fund

## Functionality Related Requirement Classification

- ① Core functionality Requirement
  - Functional req
  - without it product is not useful
- ② Auxiliary functionality
  - Non-functional req
  - supplement core functionality

### Requirement



## Acillary Functionality

- ① Software footprint requirement
  - Size of .exe or .apk file required
- ② Safety requirement - Protect from logical injuries
  - The product must not harmful
- ③ Statutory functionality
  - Follow the standards (IEEE standards etc.)
- ④ Memory Constraints
  - Memory required for executable file (RAM)
- ⑤ Data Integrity Protection
  - Check for valid Input
- ⑥ Security
  - Safe from external attacks
- ⑦ Response time functionality
  - Minimum time response time from software (Bare minimum)
    - That's a software's least minimum time to response.
- ⑧ Usability functionality (User friendliness)
  - To make the software usable intuitively
- ⑨ Fault tolerance functionality
  - The software does not crash or abort when a mistake is committed by user

## Inverse Requirement

Requirements that are not naturally requirement but the client provide that specific requirement like color of interface should be blue or black etc. Some requirement that must be NOT be happened at some stage. These all requirement are also a part of FS Document.

28 - 9 - 2022

## Business Requirement

- Business need of product
  - Increase benefit or
  - Increase customer satisfaction
- Business Requirement comes from funding sponsors, corporate or product manager

### Product Vision

J

J

J



Project scope for ...

Release 1.0

Release 2.0

Release n

Release 1.0

(Client)

- 100 requirement pack divided in Scopes

# Template of Scope & Vision Document

## ① Background

- Summarize the template and resources

## ② Business Opportunity

- Compare with new product

## ③ Business Objective

- Quantitative and measurable mechanism

(

1- For [Target Customer]

2- Who [Need or Opportunity]

3- The [Product Name]

4- Is [Product Category]

5- That [key benefit, Reason to buy or use]

6- Unlike [Primary Competitive that already exists] Competitive benefits

7- Our Statement of primary difference between our product and existing product]

Business Risks - Risks from other competitors

Business assumption - Calculation about the profit and depends upon product sales

- increase profit calculation and measure

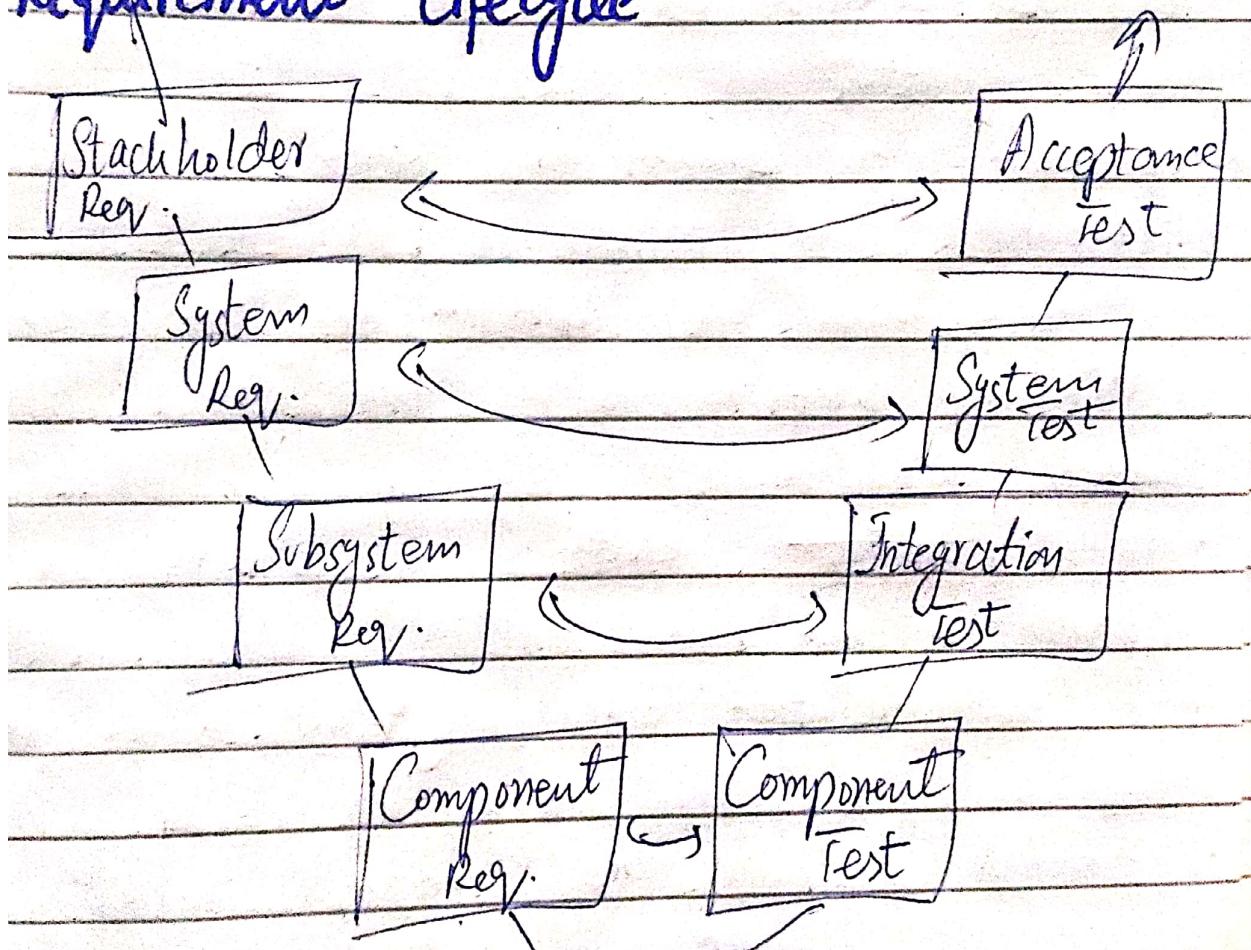
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## Requirement Process

Process → Product

- ① Req.: Elicitation
- ② Req.: Negotiation
- ③ Req.: Specification (Document) (Artifact)
- ④ Req.: Validation

## Requirement Lifecycle



12-10-2022

## Context diagram

- System is shown in circle form
- External entities are shown in Boxes
- Relation between are shown by lines.

## Ecosystem map

- System is shown in Bold box
- External entities are shown in box with narrow outline
- Relations are shown as lines.

## Difference

- System boxes are bold in ecosystem map.
- Human interface is shown in context diagram.
- Direct / Indirect relation is shown in context diagram
- Indirect relation with system in ecosystem map.
- External systems are shown specially in ecosystem map.

## Feature tree

- Visual depiction of product features organized
- There are three level L1, L2, L3

L1 - Basic, Common

L2, L3 - Sub-level

Example

Search — L1.

Search by name — sub-level of

- Blue boxes for L1

Search (L2, L3)

## Event List

- List from form

① Business related

② Time trigger

(Automatic at date)  
and time

③ Signal event

(External device)  
Component

- Identifies external system  
that could events

trigger behaviour in  
system

## User Requirement

- Elicitation

- Gathering (From existing application)

- Personal Interviews

• For agile project

18 - 10 - 2022

## Demonstration of Product Prototypes

- Used to finalize requirement from users

- There are two types of prototype

### 1- Use and discard Prototype

- Saves time for GUI

- GUI interface on Visio, Powerpoint

- After gathering requirement and approval

the GUI prototype is discarded and build from scratch.

### 2- Use and Improve Prototype

- Business logic is partially implemented

- Back-end implementation selection

- After the approval, the work is start on mock up and improve the prototype.

- ~~Saves~~

## Brainstorming

- A group of people share their ideas

- Specially to make something new product.

- No one in the group criticize other's view

- All the views are recorded for later analysis.

## Requirement Analysis Technique

### → Requirement Negotiation

Why requirement Analysis?

To find the

- Requirement Conflict
- Requirement Redundance

## Interaction Matrix

An interaction matrix is a matrix where the rows and columns are labelled with requirements identifiers. The elements of a matrix are filled in with a value which indicates whether or not requirement conflict, overlap or are independent. Interaction matrix are similar to traceability matrices.

- This is a systematic approach to checking requirements which ensures that the interaction between all requirements in the system or in an identified class of requirements are considered.

- The interaction matrix is a useful input to the negotiation, as it is a clean summary of requirements which may cause problems and whose final form may need to be negotiated.

- Compare each requirement with all other requirement
- Check the difference, overlapping and conflict

For unique  $\rightarrow$  value = 0

For overlap  $\rightarrow$  value = 1000

For conflicting  $\rightarrow$  value = 1

- If there is a confusion between req.  
then we will take them as conflicting

$\rightarrow$  Implementation

	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	R <sub>6</sub>
R <sub>1</sub>		0	0	1	1000	
R <sub>2</sub>	0		0	1	1	1
R <sub>3</sub>						
R <sub>4</sub>						
R <sub>5</sub>						
R <sub>6</sub>						

## Requirement Negotiation Stage

To resolve the conflicting and overlapping requirement, this stage is used.

There are three ways to negotiation

- Discussion (Group discussion)

- Meeting (F2F)

- Prioritization

- Agreement

Objective Resolve  
conflicts

What about unnecessary requirement?

They are just deleted

- Before deletion

① F2F meeting

② Discussion

There are 3 steps of meeting

① Informative stage - Find objectives

② Discussion stage - Resolve the problem

③ Resolution stage - Action concerning the requirement are agreed

## Requirement Validation Input

① Document

② Organization Standards

→ Verify requirement attribute

• Analysis on notes or on raw data

• Validation on final document

If problem then resolve else agree

• Requirement Review is a group activity

• Proper pre-planned

• Discussion during plan + suggestions

→ Problem req are noted with Pg# and Req#

## SRE

Ecosystem map vs context diagram

- Boxes are bold in Ecosystem map
- Human interface in Context system.
- Direct relation / interact in Context system.
- Indirect relation with systems in Ecosystem
- Eg. External [system] and indirect relation in Ecosystem map.

## Feature Tree

- Visual depiction of product features organized
- Three level L1, L2, L3
- L1 - Basic / Common and L2, L3 sub-level
- Example L1 (Search) L2, L3 (Search by name)
  - Oval for system
  - Main branch L1
- L2, L3 sub-levels, sub-branch
- Blue box for L1

## Event List

- List form - Identifies external events that could trigger behaviour in system
- Business related event trigger by user
- Time trigger (Automatical at ~~data~~ time)

### Hardware

- Signal events (External device, component)

### User Requirement

#### Elicitation (Stakeholder)

- Draw out
- Connotes a dialog in which information is drawn out.

#### Gathering (Existing application, Document)

- Come together ↓
- Survey sources (System)

### Personal Interviews

For agile project

- Question in defined format

Stakeholder	Technique
(1-3)	Interview
(5-10)	
> 100	

If Stakeholder is very busy then observe