System analysis and design

**Requirement engineering**

Process of defining, documenting and maintaining requirements

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Main categories of requirements

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Functional:

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Non

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functional

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Data

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Environmental/ Context of use

a functional requirement defines a system or its component. It describes the functions a software must perform. A function is nothing but inputs, its behavior, and outputs. It can be a calculation, data manipulation, business process, user interaction, or any other specific functionality which defines what function a system is likely to perform. Functional software requirements help you to capture the intended behavior of the system. This behavior may be expressed as functions, services or tasks or which system is required to perform.

A non-functional requirement defines the quality attribute of a software system. They represent a set of standards used to judge the specific operation of a system. Example, how fast does the website load?

A non-functional requirement is essential to ensure the usability and effectiveness of the entire software system. Failing to meet non-functional requirements can result in systems that fail to satisfy user needs. Non-functional Requirements allows you to impose constraints or restrictions on the design of the system across the various agile backlogs. Example, the site should load in 3 seconds when the number of simultaneous users are > 10000. Description of non-functional requirements is just as critical as a functional requirement.

**Example of Functional Requirements**

* The software automatically validates customers against the ABC Contact Management System
* The Sales system should allow users to record customers sales
* The background color for all windows in the application will be blue and have a hexadecimal RGB color value of 0x0000FF.
* Only Managerial level employees have the right to view revenue data.
* The software system should be integrated with banking API
* The software system should pass [Section 508](https://www.section508.gov/) accessibility requirement.

**Examples of Non-functional requirements**

Here, are some examples of non-functional requirement:

1. Users must change the initially assigned login password immediately after the first successful login. Moreover, the initial should never be reused.
2. Employees never allowed to update their salary information. Such attempt should be reported to the security administrator.
3. Every unsuccessful attempt by a user to access an item of data shall be recorded on an audit trail.
4. A website should be capable enough to handle 20 million users with affecting its performance
5. The software should be portable. So moving from one OS to other OS does not create any problem.
6. Privacy of information, the export of restricted technologies, intellectual property rights, etc. should be audited

**In software engineering, functional requirement provides a clear description what the functionality the system must accomplish.. E.g Input. How it behaves when a user inputs something in the system. And output : how does it display. Did it meet the standard ?**

**Non functional requirement : has to do with how it look, speed,**

**Data: when you talk about data in the requirement modelling , you talk about STORAGE, FORMAT, PROTOCOL..THE INPUT MUST BE IN A PARTICULAR FORMAT ..**

**ENVIROMENTAL : IS IT GOOD FOR THE ENVIROMENT , SECURED, IS IT SENSITIVE ?**

Key layers that drive

interaction

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Motivation

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Goal

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Task

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Feature

**Modelling :**

**At each development stage, we create or modify model..**