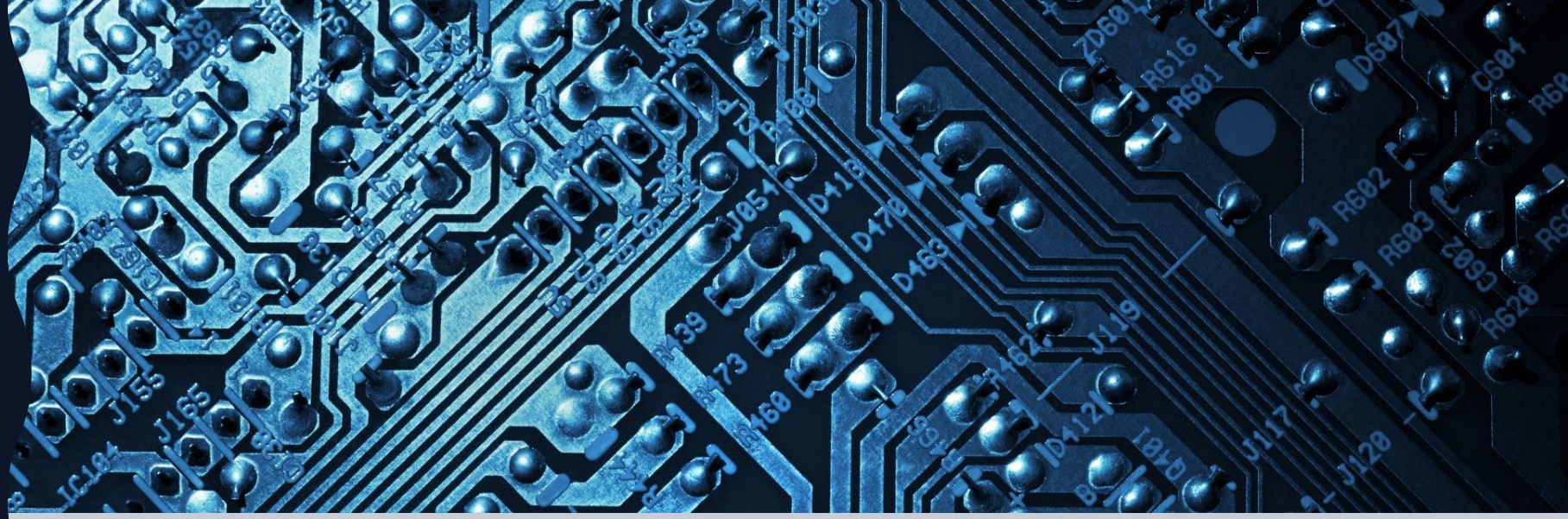


Software Requirements

Software Requirements

- Requirements are descriptions of the services that a software system must provide and the constraints under which it must operate.
- These requirements reflect the needs of customers for a system .
- The process of finding out, analysing, documenting and checking these services and constraints is called requirements engineering (RE).
- In some cases, a requirement is simply a high-level, abstract statement of a service that a system should provide or a constraint on a system. At the other extreme, it is a detailed, formal definition of a system function.

Types of Requirement

- User requirements :-

1. User requirements are statements, in a natural language plus diagrams, of what services the system is expected to provide to system users and the constraints under which it must operate.
2. The readers of the user requirements are not usually concerned with how the system will be implemented and may be managers who are not interested in the detailed facilities of the system.

Types of Requirement

- **System Requirement Specification :-**

- The user should be provided with facilities to define the type of external files.
- Each external file may have an associated tool which may be applied to the file and is represented as a specific icon on the user's display.
- Facilities should be provided for the icon representing an external file to be define by the user.
- When the user selects an icon representing an external file, the effect of that selection is to apply the tool associated with the type of external file to the file represented by the selected icon.

Functional and Non functional requirements

- **Software system requirements are often classified as**

1. functional requirements and
2. non functional Requirements

1. Functional requirements :

- These are statements of services the system should provide, how the system should react to particular inputs, and how the system should behave in particular situations.
- In some cases, the functional requirements may also explicitly state what the system should not do.

Functional requirements :-

- The functional requirements for a system describe what the system should do.
- These requirements depend on the type of software being developed, the expected users of the software, and the general approach taken by the organization when writing requirements.
- Functional system requirements describe the system functions, its inputs and outputs, exceptions.
- These functional user requirements define specific facilities to be provided by the system.

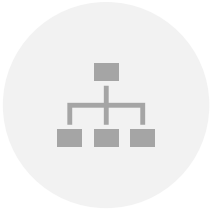
Functional and Non functional requirements

2. Non-functional requirements :

- These are constraints on the services or functions offered by the system.
- They include timing constraints, constraints on the development process, and constraints imposed by standards.
- Non-functional requirements often apply to the system as a whole, rather than individual system features or services.

Example of functional requirements

A) DESCRIPTIONS OF DATA TO BE ENTERED INTO THE SYSTEM.



B) DESCRIPTIONS OF OPERATIONS PERFORMED BY EACH SCREEN.

WHO CAN ENTER THE DATA INTO THE SYSTEM

DESCRIPTIONS OF SYSTEM REPORTS OR OTHER OUTPUTS

IN PRINCIPLE, THE FUNCTIONAL REQUIREMENTS SPECIFICATION OF A SYSTEM SHOULD BE BOTH COMPLETE AND CONSISTENT.

COMPLETENESS MEANS THAT ALL SERVICES REQUIRED BY THE USER SHOULD BE DEFINED.

CONSISTENCY MEANS THAT REQUIREMENTS SHOULD NOT HAVE CONTRADICTORY DEFINITIONS.

Non-Functional requirements

- Non-functional requirements, as the name suggests, are requirements that are not directly concerned with the specific services delivered by the system to its users.
- They may relate to system properties such as reliability, response time, and store occupancy.
- Non-functional requirements, such as performance, security, or availability, usually specify characteristics of the system as a whole.
- Non-functional requirements are often more critical than individual functional requirements.

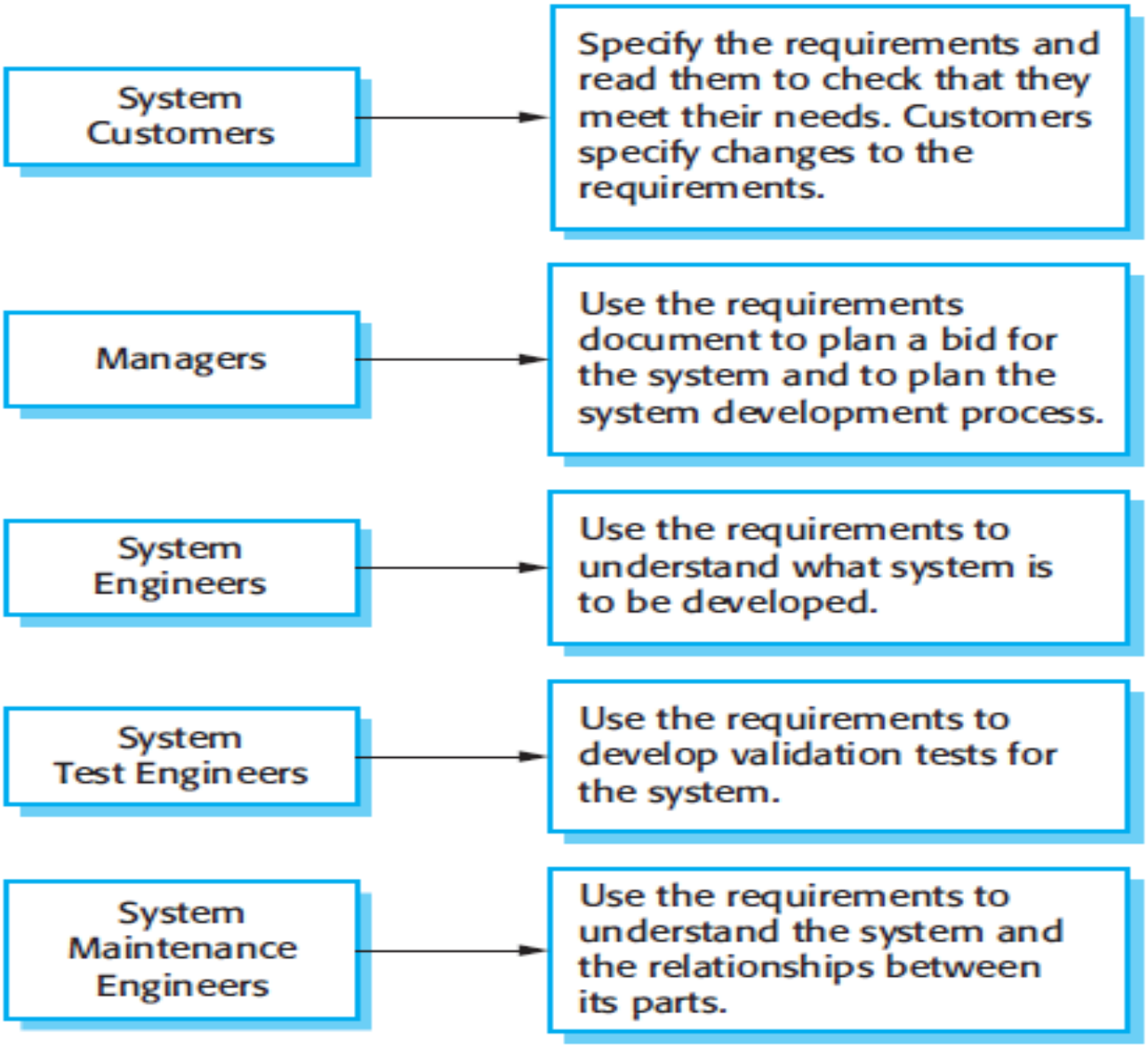
Example of Non-Functional requirements

- For example, if an aircraft system does not meet its reliability requirements ,it will not be certified as safe for operation; if an embedded control system fails to meet its performance requirements, the control functions will not operate correctly.
- Non-functional requirements arise through user needs, because of budget constraints, organizational policies, the need for interoperability with other software or hardware systems, or external factors such as safety regulations or privacy legislation.

How to write SRS

Software Requirements Document

- The software requirements document (sometimes called the software requirements specification or SRS) is an official statement of what the system developers should implement.
- It should include both the user requirements for a system and a detailed specification of the system requirements.
- Requirements documents are essential when an outside contractor is developing the software system.
- The requirements document has a diverse set of users, ranging from the senior management of the organization that is paying for the system to the engineers responsible for developing the software.


System Customers
Specify the requirements and read them to check that they meet their needs. Customers specify changes to the requirements.
Managers
Use the requirements document to plan a bid for the system and to plan the system development process.
System Engineers
Use the requirements to understand what system is to be developed.
System Test Engineers
Use the requirements to develop validation tests for the system.
System Maintenance Engineers
Use the requirements to understand the system and the relationships between its parts.

- The level of detail that you should include in a requirements document depends on the type of system that is being developed and the development process used.
- Critical systems need to have detailed requirements because safety and security have to be analysed in detail.
- When the system is to be developed by a separate company (e.g.,through outsourcing), the system specifications need to be detailed and precise.
- If an inhouse, iterative development process is used, the requirements document can be much less detailed and any ambiguities can be resolved during development of the system.

The standard structure of SRS specified by IEEE is layout as under:

1. Introduction
    - 1.1 Purpose
    - 1.2 Definition
    - 1.3 System overview
    - 1.4 References
2. Overall description
    - 2.1 Product perspective
        - 2.1.1 System Interfaces
        - 2.1.2 User Interfaces
        - 2.1.3 Hardware Interfaces
        - 2.1.4 Software Interfaces
        - 2.1.5 Operations

Benefits

1. It acts as an agreement between the customer and the supplier specifying the needs of the customer and the actions taken to meet the desired needs.
2. It reduces the development efforts.
3. It provides a basis for establishing cost and schedules.
4. It provides an standard for enhancement .
5. It is a mean to support validation and verification.