Information System Design

IT60105

Lecture 3

System Requirement Specification

Lecture #3

- System Requirement Specification (SRS)
- SRS Document Template

System Requirement Specification

- Objectives:
  - Understanding the precise requirement of the customers
    - Avoids bitter developer-customer disputes
    - Legal battle, timely payment
  - Requirements documentation
    - Several contractors can bid for the contract, offering, perhaps, different ways of meeting the customer’s need
    - To avoid number of iterative changes during the development life cycle

Requirement Engineering

- Requirements for a system are the description of the services provided by the system and its operational constraints

- The process of finding out, analyzing, documenting and checking these services and constraints is called Requirements Engineering

Requirement Engineering

Activities:

- Requirement gathering and analysis
- Requirement specification

Note: *SRS activities are carried out by* ***System Analysts***

Requirement Gathering and Analysis

- **Requirements gathering**

  What is the problem?

  Why is it important to solve the problem?

  What are the possible solutions to the problem?

  What exactly are the input to the system and what exactly are the data output required to the system?

  What are the likely complexities that might arise while solving the problem?

  If there are external software or hardware with which the developed software has to interface, then what exactly would the data interchange formats with the external system be?

Requirement Gathering and Analysis

- **Requirements analysis**
  - Resolve anomaly/ambiguity in the requirement (customer)
    - e.g. Distributed system without the specification of network protocols
  - Resolve the contradiction in requirement
    - e.g. OODBMS and SQL query, faster execution with lesser memory requirement
  - Resolve incompleteness
    - Overlooked in some requirements

Requirements Specification

- **User requirements**
  - High level abstract requirement
    - Are statements, in a natural language plus diagrams, of what services the system is expected to provide and the constraints under which it must operate

- **System requirements**
  - Detailed description of what the system should do
  - Set out the system's functions, services and operational constraints
    - Functional requirements
    - Non-functional requirements
    - Interface requirements

Functional Requirements

- Functional system requirements describe the system function in detail, its inputs and outputs, exceptions, and so on

- It should be
  - Complete
    - All services required by the user should be defined
  - Consistent
    - Requirements should not have contradictory definitions

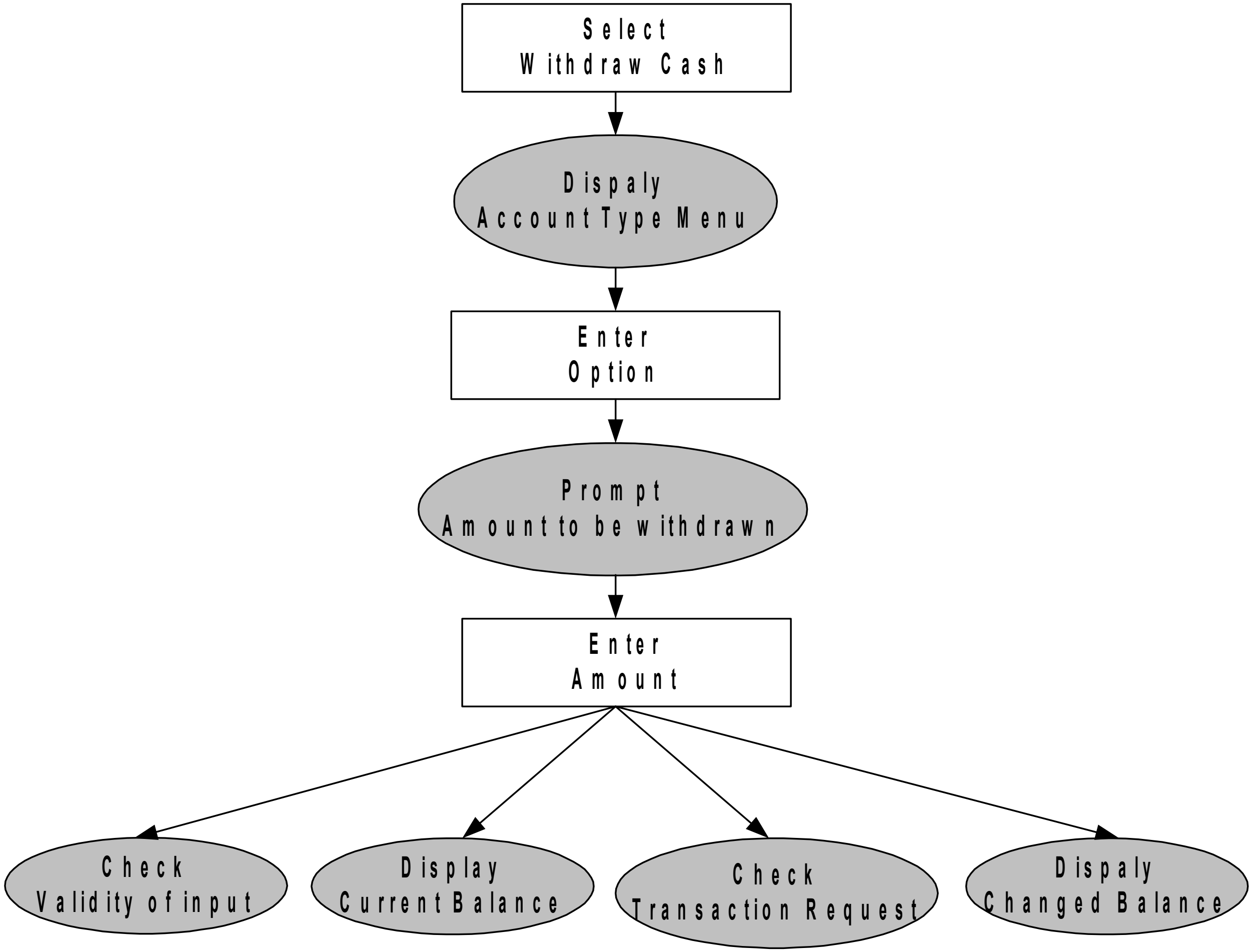
An Example: ATM

- Case Study: **Automated Teller Machine**

ATM: Functional Requirements

- **Withdraw Cash**
- **Deposit Cash**
- **Balance Enquiry**
- **Passbook Update**
- **Transaction Details**
- **PIN Change**

ATM: Withdraw Cash



ATM: Withdraw Cash

F1: Withdraw Cash

Description: Determines the type of accounts, amount to be withdrawn, valid transaction

F1.1: Select Withdraw Cash

Input: Withdraw Cash Option

Output: Prompt to enter Account Type

F1.2: Select Account Type

Input: User Option

Output: Prompt to enter Amount

F1.3: Read Amount

Input: Amount to be withdrawn (within a range)

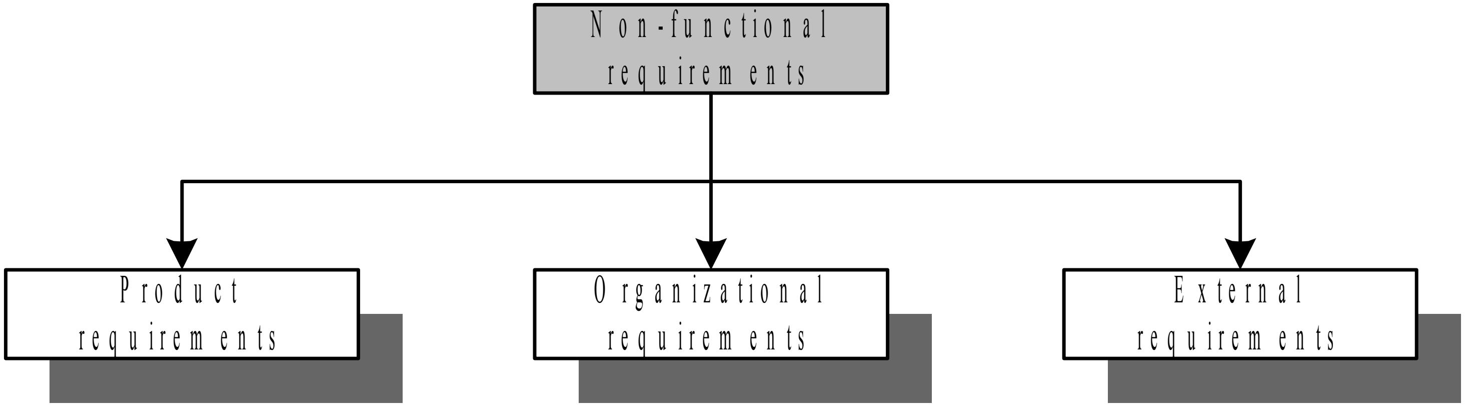
Output: Processing for "Valid Transaction" with requested cash and printed transaction **OR "**Failed Transaction" with regret message

Non-Functional Requirements

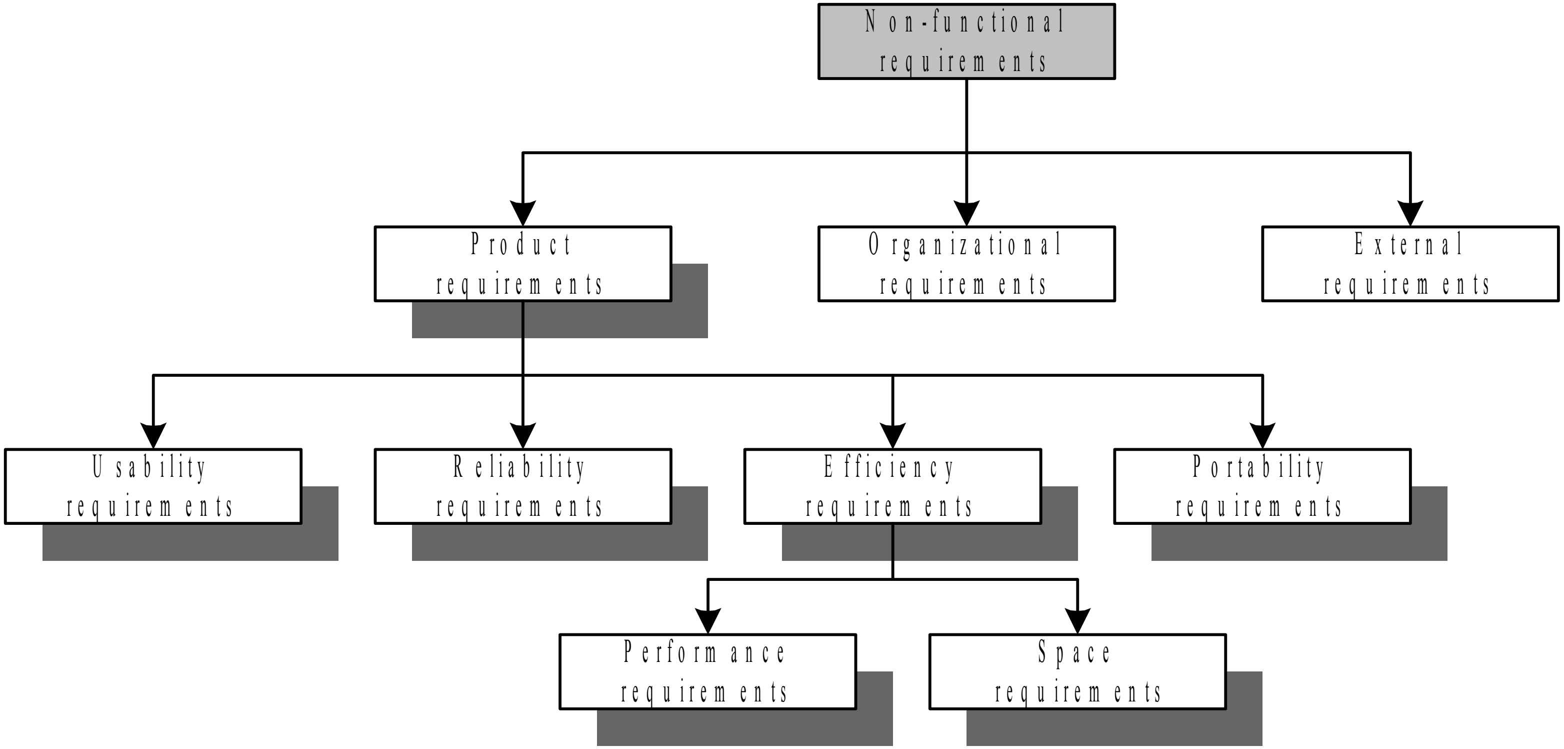
- Nonfunctional requirements deal with the characteristics of the system that cannot be expressed as functions
- Examples:
  - Maintainability
  - Portability
  - Usability
  - Reliability issues
  - Accuracy of results
  - Human-computer interface issues
  - Constraints on the system implementation

  Many more .....

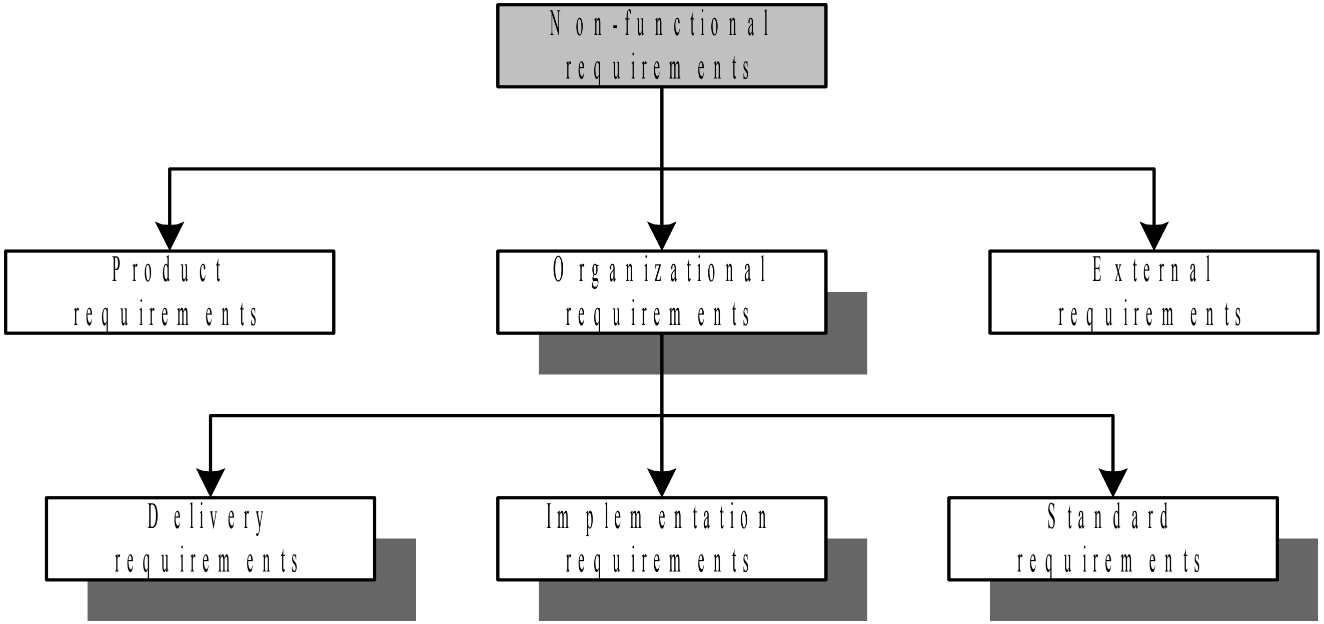
Non-Functional Requirements



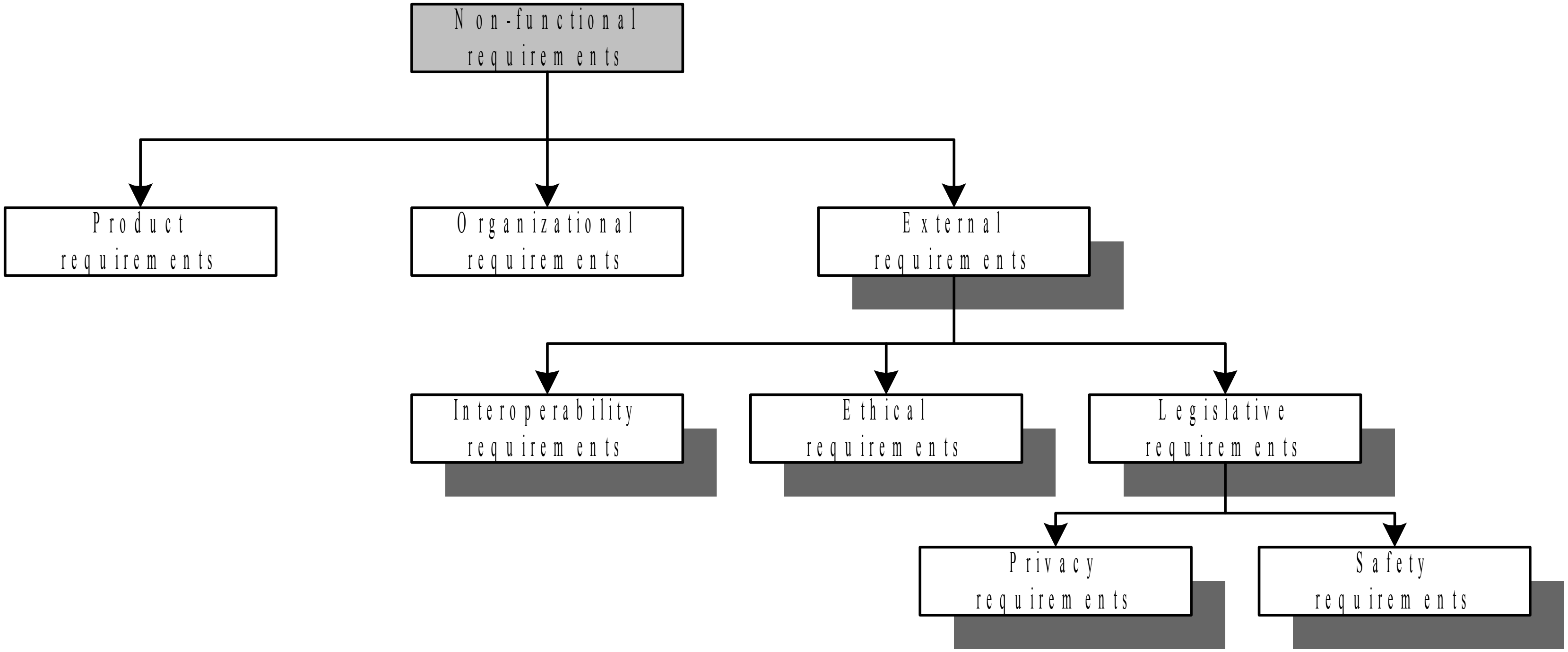
Non-Functional Requirements



Non-Functional Requirements



Non-Functional Requirements



Interface Requirements

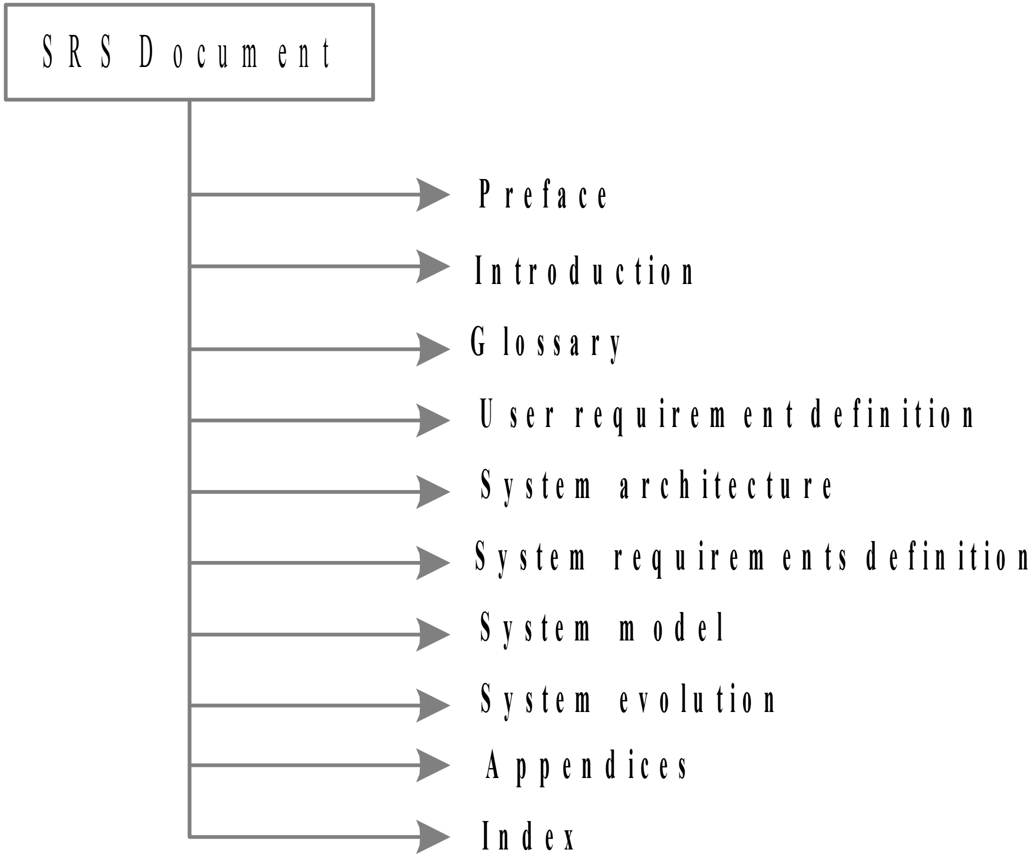
- Different interface for different functionality in the system
  - Specified with user's level of understanding
  - GUI or Command based
  - With HCI perspective

SRS Document Template

Importance of SRS Document

- Systematic organization of all the requirements
- Cater to the needs of a wide variety of audience
  - Users, customers, marketing personnel
  - Software developers
  - Test engineers
  - User documentation writers
  - Project managers
  - Maintenance engineers

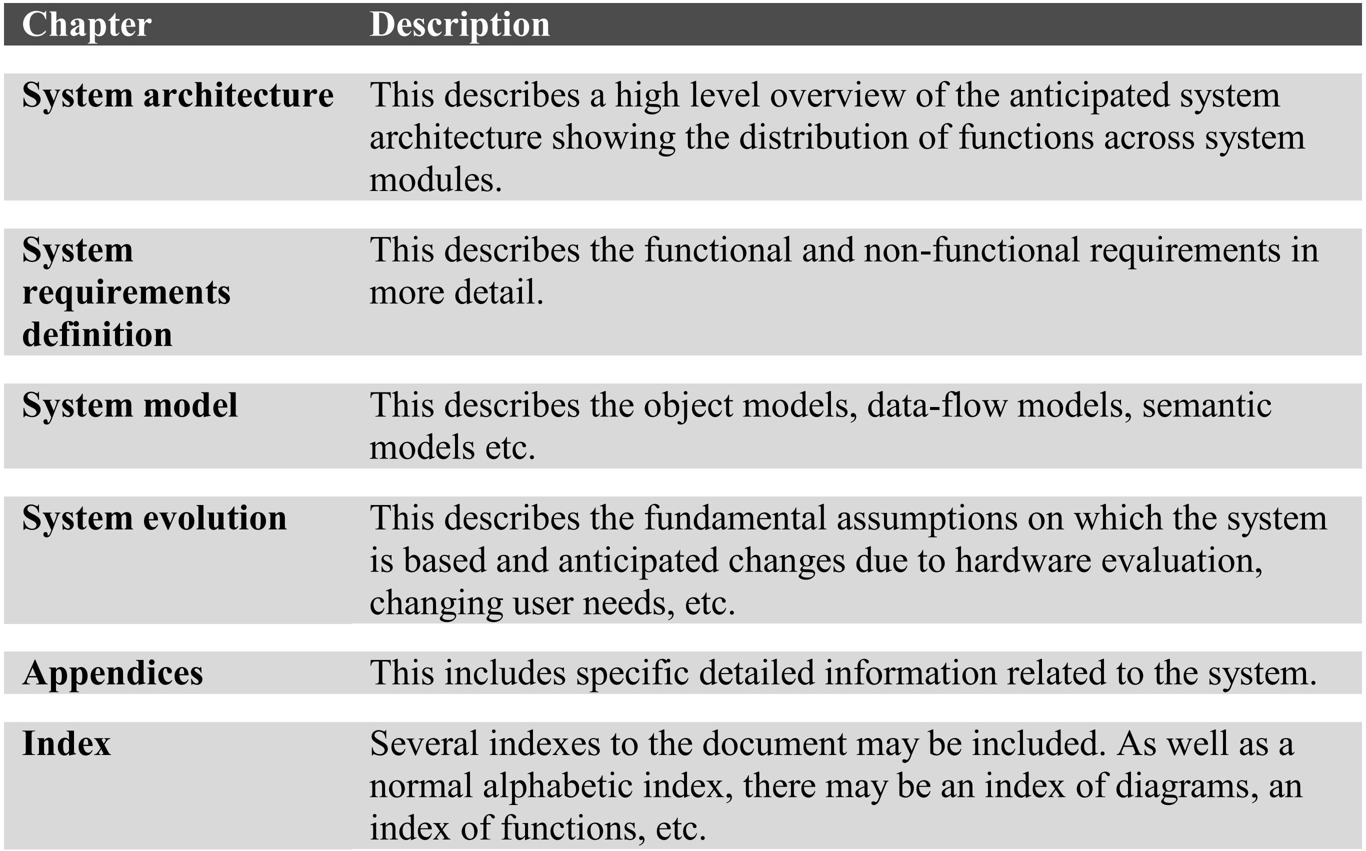
SRS Document Template



SRS Document Template

Chapter	Description
Preface	This defines the expected readership of the document and describes its version history, including a rationale for the creation of a new version and a summary of the changes made in each version.
Introduction	This describes the need for the system. It should briefly describe its function and explain how it will work with other systems. It describes how the system fits into the overall business or strategic objective of the organization.
Glossary	This defines the technical terms used in the document. Author should not make assumptions about the experience or expertise of the reader.
User requirements definition	This defines the service provided for the user. User natural language, diagrams or other notations those are easy to understand by the customers.

SRS Document Template (Cont’d)



Chapter	Description
System architecture	This describes a high level overview of the anticipated system architecture showing the distribution of functions across system modules.
System requirements definition	This describes the functional and non-functional requirements in more detail.
System model	This describes the object models, data-flow models, semantic models etc.
System evolution	This describes the fundamental assumptions on which the system is based and anticipated changes due to hardware evaluation, changing user needs, etc.
Appendices	This includes specific detailed information related to the system.
Index	Several indexes to the document may be included. As well as a normal alphabetic index, there may be an index of diagrams, an index of functions, etc.

IEEE Standard of SRS Document

For the IEEE Standard (1998) of SRS Document preparation, see the link below:

http://www.facweb.iitkgp.ernet.in/~dsamanta

Problems to Ponder

- Why SRS document is often touted as a "Black Box" document?
- "SRS document should be a flexible document" - Agree or disagree the comment
- SRS can be taken as a legal document for the customer as well as the developer - Justify

Problems to Ponder

- How Requirement Engineering is related to *process development models*?

- How Requirement Engineering is related to *software quality*?

- How RE takes place in *Agile software development environment*?