**3.4 Requirements Engineering Processes:**

Requirements engineering is a process that involves all of the activities required to create and maintain a system requirements document. There are four generic, high level requirements engineering process activities. These are a system **feasibility study, the elicitation and analysis of requirements, the specification of requirements and their documentation and finally the validation of these requirements**. Figure 3.1 illustrates the relationship between these activities.

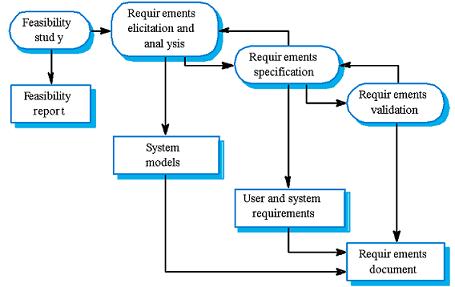


Figure 3.1: The requirements engineering process

**3.4.1 Feasibility studies**

* A feasibility study decides whether or not the proposed system is worthwhile.
* A short focused study that checks.
* If the system contributes to organizational objectives.
* If the system can be engineered using current technology and within budget.
* If the system can be integrated with other systems that are used.
* Based on information assessment (what is required), information collection and report writing.
* Questions for people in the organization

1. What if the system wasn't implemented?
2. What are current process problems?
3. How will the proposed system help?
4. What will be the integration problems?
5. Is new technology needed? What skills?
6. What facilities must be supported by the proposed system?

**3.4.2 Elicitation and analysis**

* Sometimes called requirements elicitation, requirements discovery.
* Involves technical staff working with customers to find out about the application domain, the services that the system should provide and system's operational constraints.
* May involve end-users, managers, engineers involved in maintenance, domain experts, unions, etc. These are called stakeholders.
* Stakeholders don't know what they really want.
* Stakeholders express requirements in their own terms.
* Different stakeholders may have conflicting requirements.
* Organizational and political factors may influence the system requirements.
* The requirements change during the analysis process. New stakeholders may emerge and the business environment change.

The requirements analysis process is shown in figure 3.2.

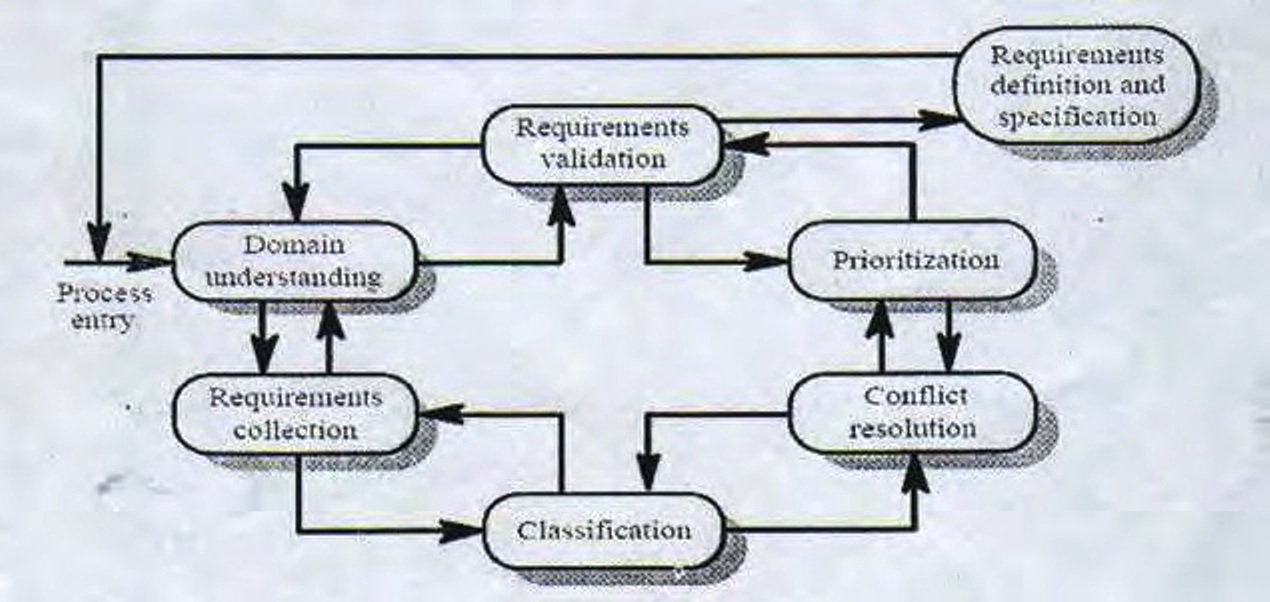


Figure 3.2 the requirements Analysis Process

**3.4.3 The requirements Document**

* Sometimes the requirements document called Software Requirements Specification or SRS.
* The requirements document is the official statement of what is required of the system developers.
* Should include both a definition of user requirements and a specification of the system requirements.
* It is NOT a design document. As far as possible, it should set of WHAT the system should do rather than HOW it should do it.
* If there are a large number of requirements, the detailed system requirements may be presented as separate documents.

Figure 3.3 illustrates possible users of the document and how they use it.

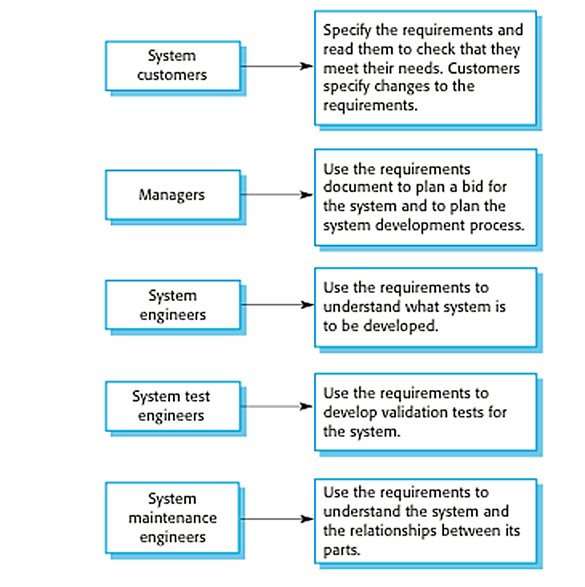


Figure 3.3 Users of a requirements document

**3.4.4 Requirements validation**

* Concerned with demonstrating that the requirements define the system that the customer really wants.
* Requirements error costs are high so validation is very important.
* Fixing a requirements error after delivery may cost up to 100 times the cost of fixing an implementation error.

**Requirements checking**

* **Validity**. Does the system provide the functions which best support the customer's needs?
* **Consistency**. Are there any requirements conflicts?
* **Completeness**. Are all functions required by the customer included?
* **Realism**. Can the requirements be implemented given available budget and technology?
* **Verifiability**. Can the requirements be checked?

**Requirements validation techniques**

* **Requirements reviews:** The requirements are analyzed systematically by a team of reviewer.
* **Prototyping:** In this approach to validation, an executable model of the system is demonstrated to end users and customers.
* **Test-case generation:** Requirements should be testable if the test for the requirements are devised as part of the validation process this often reveals requirements problems.

**3.5 Requirements Management**

* Requirements management is the process of managing changing requirements during the requirements engineering process and system development.
* Requirements are inevitably incomplete and inconsistent.
* New requirements emerge during the process as business needs change and a better understanding of the system is developed.
* Different viewpoints have different requirements and these are often contradictory.