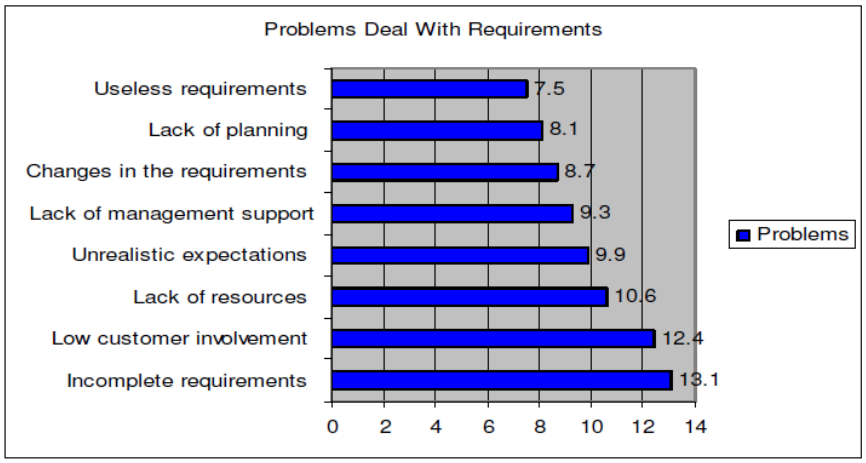
Requirements Engineering

Requirements Engineering:

Requirements Engineering is one of the challenging and key tasks in the development of software products

Importance of Requirement Engineering and project failures:

Below diagram shows current survey of why projects fail.



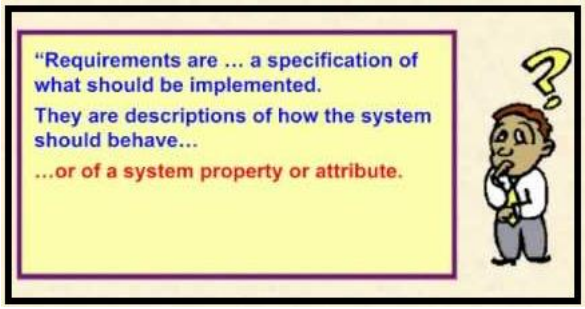
According to survey Requirement problems are the single No.1 reason for project to fail. So requirement can contain defects:

- Characteristics of defective requirements:
- Lack of Cohesiveness
- Lack of Completeness
- Lack of Correctness
- Lack of Consistency
- Lack of Project Relevance
- Lack of Testability, Usability, Validatability
- Ambiguous

Why do we want good requirements?

1. To achieve the project goals.
2. Ensures Completeness of Product
3. Cost & Schedule Predictability
4. Reduced Changes later in the Life Cycle
5. Better Consensus amongst Stakeholders
6. Reduce future maintenance cost

What is a Requirement?



Importance of Requirements – Some statistics!

- Requirements errors are the most common type of systems development error and the most costly to fix.

No.	Cause of project failure	%
1	Incomplete requirements	13.1
2	Lack of User involvement	12.4
3	Lack of resources	10.6
4	Unrealistic expectations	9.9
5	Lack of executive support	9.3
6	Changing requirements	8.7
7	Lack of Planning	8.1
8	Didn't need it any more	7.5
9	Lack of IT management	6.2
10	Technology illiteracy	4.3
	Others	9.9

Requirements Engineering

Requirements Engineering is a disciplined, process-oriented approach to the definition, documentation, and maintenance of software requirements throughout the software development life cycle.

Software requirements engineering is made up of two major processes:

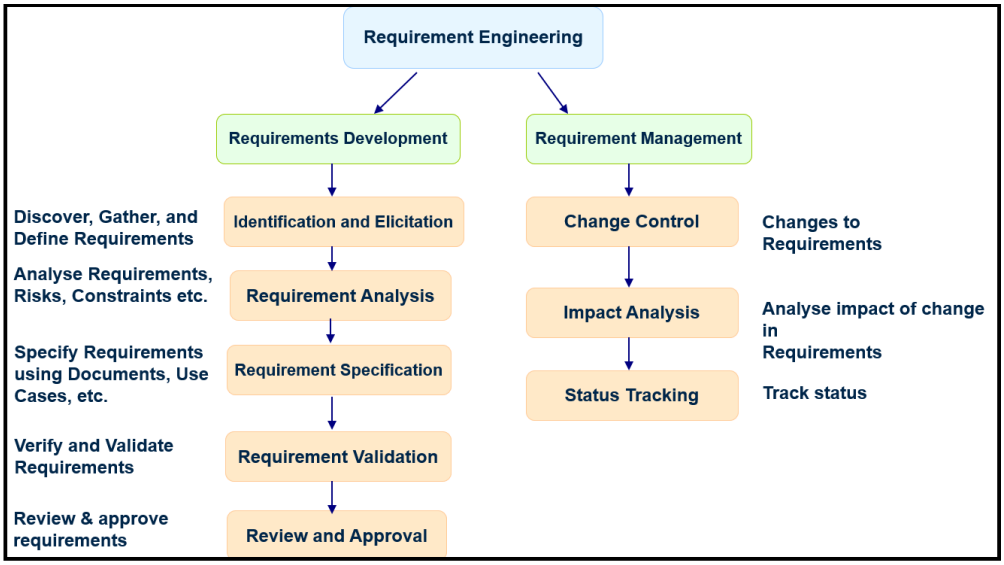
1. **Requirements Development:**

   Requirements development involves all of the activities that are part of eliciting, analysing, specifying, and validating the requirements.

2. **Requirements Management:**

   It is the process of documenting, analysing, tracing, prioritizing and agreeing on requirements and then controlling change and communicating to relevant stakeholders.

   Requirement Engineering classification diagrammatically shown as follows:



Requirement Development	
Requirements Elicitation	Developers and stakeholders meet, the latter are inquired concerning their needs and wants regarding the software product.
Requirement analysis	Requirements are identified (including new ones if the development is iterative) and conflicts with stakeholders are solved.
Requirement specification	Requirements are documented in a formal artifact called Requirements Specification (RS).with the help of usecases etc.
Requirements Validation	Checking that the documented requirements and models are consistent and meet the needs of the stakeholder.
Review and Approval	Only if the final draft passes the validation process, the SRS becomes official. Sign off
Requirement Management	
Change Control	Identify changes to requirements
Impact Analysis	Analyze impact of change in Requirements
Status Tracking	Tracking the status of the requirements as one progresses through the software development process**.**