Manual testing

Module 1: Testing Concepts(Theory) What?
MOdule 2: Testing Projects(Practical) How?
Module 3: Agile Process - Jira

Software
A software is a collection of computer programs that helps us to perform a task.

Types of software:
1. System software:
   Ex: Device drivers, Operating systems, Servers, Utilities, etc
2. Programming software:
   Ex: compilers, debuggers, interpreters, etc.
3. Application Software
   Ex: Web Application, MObile Apps, Desktop Applications etc.

ABC Bank(company)----->IT Company----->Develop------>Test------>Deliver----->ABC Bank

What is software Testing?
● Software Testing is a part of the software development process.
● Software Testing is an activity to detect and identify the defects in the software.
● The objective of testing is to release quality products to the client.

Software Quality:
Customer justification of how well the product is working

Parameter to check software quality
● Bug-free
● Delivered on time
● Within budget
● Meets requirements and/or expectations
● Maintainable

Project Vs product

- **Project:**
  - If a software application is developed for a specific customer based on the requirement.
  - Done by service based company

- **Product:**
  - If software applications are developed for multiple customers based on market requirements.
  - Done by product based company

Why do we need software testing?
- deliver quality product to customer

Error, Bug/defects and Failure

- Error:
  - Human mistake
  - Incorrect human action
  - Done by developers

- Bug/defects:
  - Deviation of expected and actual result
  - Something not working in application according to requirement
  - Eg: not logging in with valid username and password

- Failure:
  - Deviation identified by end user

Why does software have bugs?
- Miscommunications or no communication
- Software complexity
- Programming errors (developer errors)
- Changing requirements (frequent requirement changes)
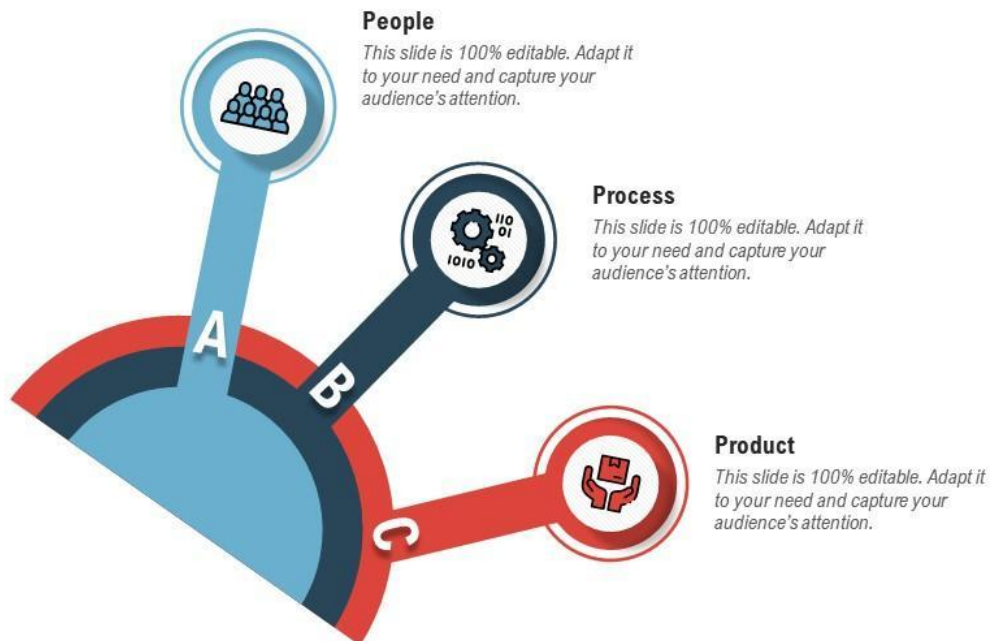- Lack of skilled testers (break application)

SDLC - Software Development Life Cycle

Software Development Life Cycle is a process used by the software industry to design, develop and test softwares.

3 pillars of company

    P - People
    P - Process
    P - Product

3P Model for Company Quality System

People
This slide is 100% editable. Adapt it to your need and capture your audience's attention.

Process
This slide is 100% editable. Adapt it to your need and capture your audience's attention.

Product
This slide is 100% editable. Adapt it to your need and capture your audience's attention.

Phases of SDLC:

Planning ---> Requirement Analysis ---> Design ---> Development ---> Testing ----> Deployment ---> Maintenance

7 PHASES OF THE
SYSTEM-DEVELOPMENT LIFE CYCLE

The *System Development Life Cycle* (SDLC for short) is a multistep, iterative process, structured in a methodical way.

This process is used to model or provide a framework for technical and non-technical activities to deliver a quality system which meets or exceeds a business's expectations or manage decision-making progression. Following are the **seven phases** of the SDLC.

1 Planning
The purpose of this first phase is to find out the scope of the problem and determine solutions. Resources, costs, time, benefits and other items should be considered here.

2 Systems Analysis & Requirements
The second phase is where teams consider the functional requirements of the project or solution. It's also where system analysis takes place—or analyzing the needs of the end users to ensure the new system can meet their expectations.

3 Systems Design
The third phase describes, in detail, the necessary specifications, features and operations that will satisfy the functional requirements of the proposed system which will be in place.

4 Development
Now the real work begins! The development phase marks the end of the initial section of the process. Additionally, this phase signifies the start of production. The development stage is also characterized by instillation & change.

5 Integration & Testing
This phase involves systems integration and system testing (of programs and procedures)—normally carried out by a Quality Assurance (QA) professional—to determine if the proposed design meets the initial set of business goals.

6 Implementation
The sixth phase is when the majority of the code for the program is written, and when the project is put into production by moving the data and components from the old system and placing them in the new system via a direct cutover.

7 Operations & Maintenance
The last phase is when end users can fine-tune the system, if they wish, to boost performance, add new capabilities or meet additional user requirements.

Models of SDLC (Process Model):

Waterfall Model:
 old and traditional Model

Steps:
- Requirement Analysis:
  - Documentation Phases
  - produces SRS Document
- Design:
  - based on SRS document, Design document is created
- Implementation:
  - coding is done with reference to design document
- Testing:
  - Software is tested
- Deployment:
  - Tested Software is deployed
- Maintenance:
 - Deployed software is maintained if any changes are required.
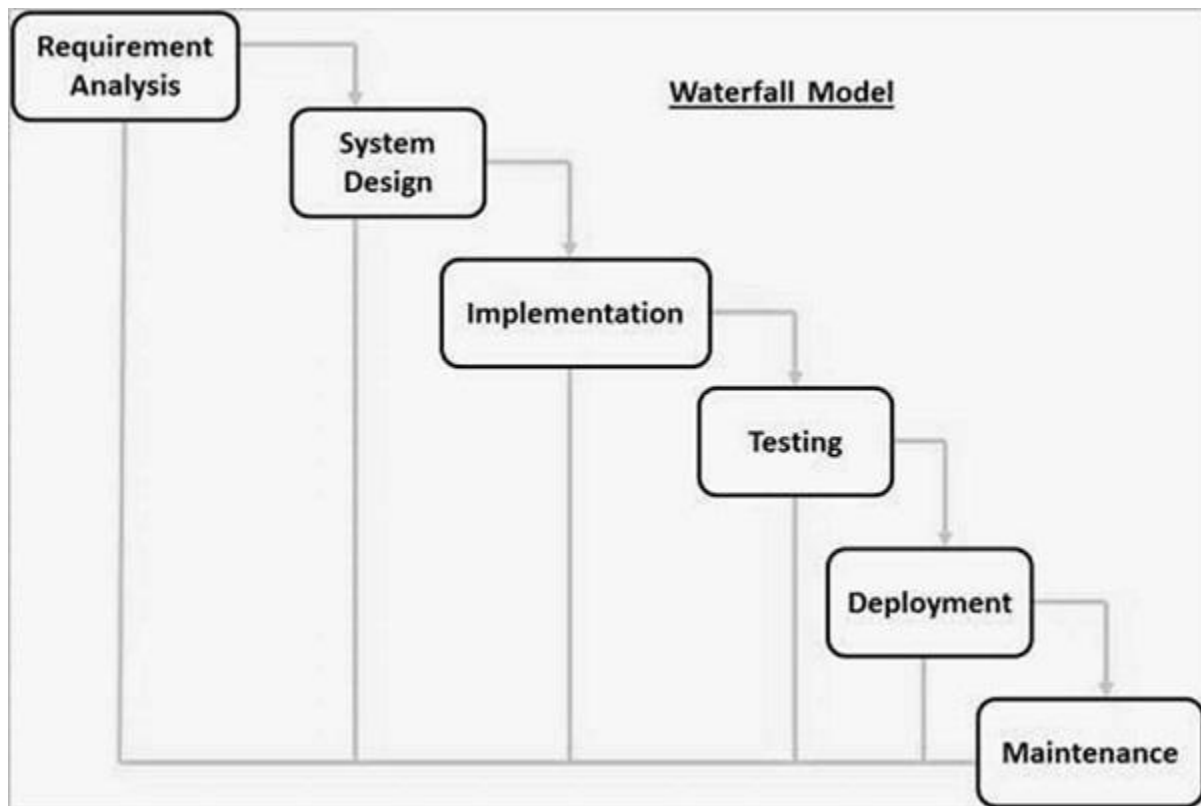
Advantages:
   1. Quality of the product will be good. (Every phase has a detailed document.)
   2. Since Requirement changes are not allowed, chances of finding bugs will be less.
   3. Initial investment is less since the testers are hired at a later stage.
   4. Preferred for small projects since the requirements are freezed.

Drawbacks:
   1. Requirement changes are not allowed.
   2. If there is a defect in requirement that will be continued in later phases.
   3. Total investment is more because time taking for rework on defects is time consuming which leads to high investment.
   4. Testing will start only after coding.

Spiral Model (Iterative Model):
1. Spiral Model is an iterative model.
2. Spiral Model overcomes drawbacks of Waterfall model.
3. We follow a spiral model whenever there is dependency on the modules.
4. In every cycle new software will be released to customers.
5. Software will be released in multiple versions. So it is also called version control model.
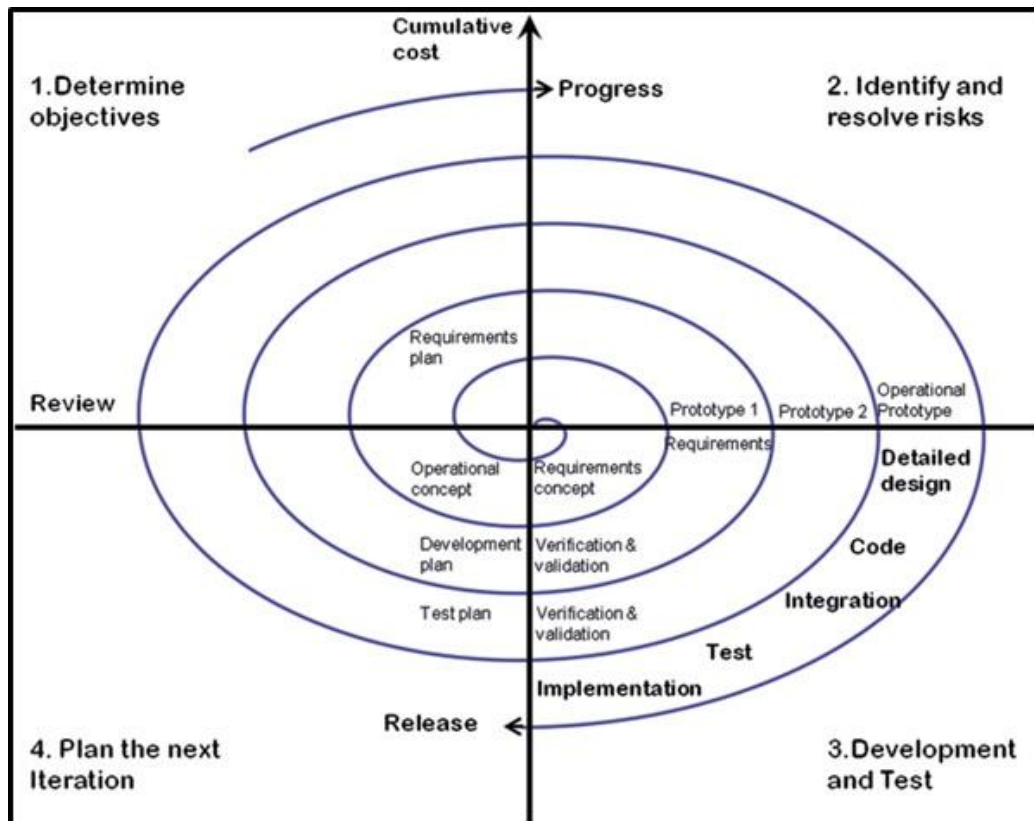
**Advantages of spiral model:**
   1. Testing is done in every cycle before going to the next cycle.
   2. Customers will get to use software for every module.
   3. Requirement changes are allowed after every cycle before going to the next cycle.

Disadvantages of spiral model:
   1. Requirement changes are not allowed in between the cycles.
   2. Every cycle of the spiral model looks like the Waterfall model.
   3. There is no testing in the requirement and design phase.

Prototype model:

Initial requirement from the customer ---> Prototype ----> Customer ---> design, coding, testing....
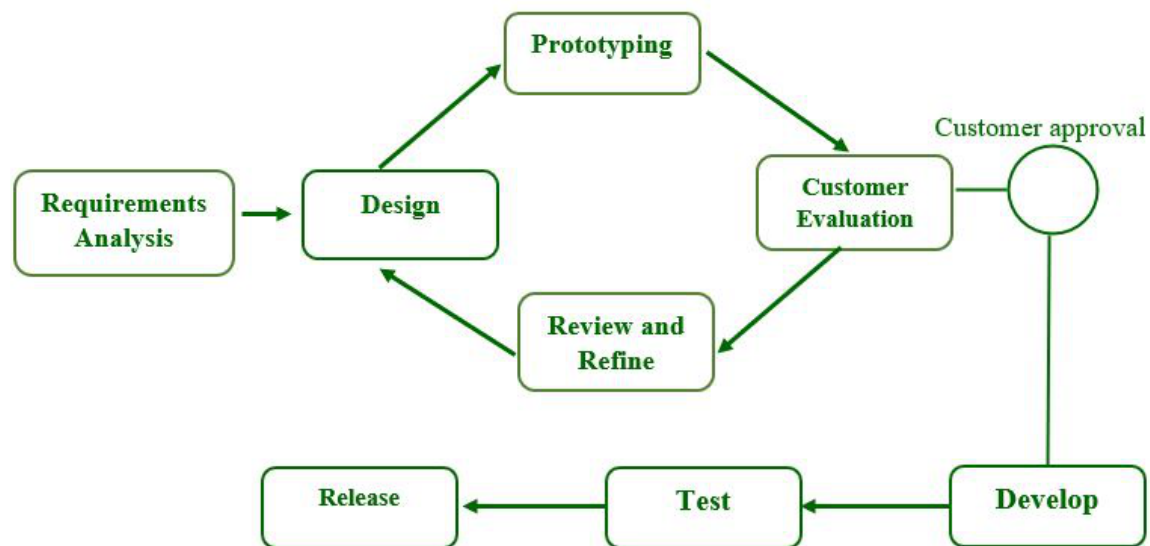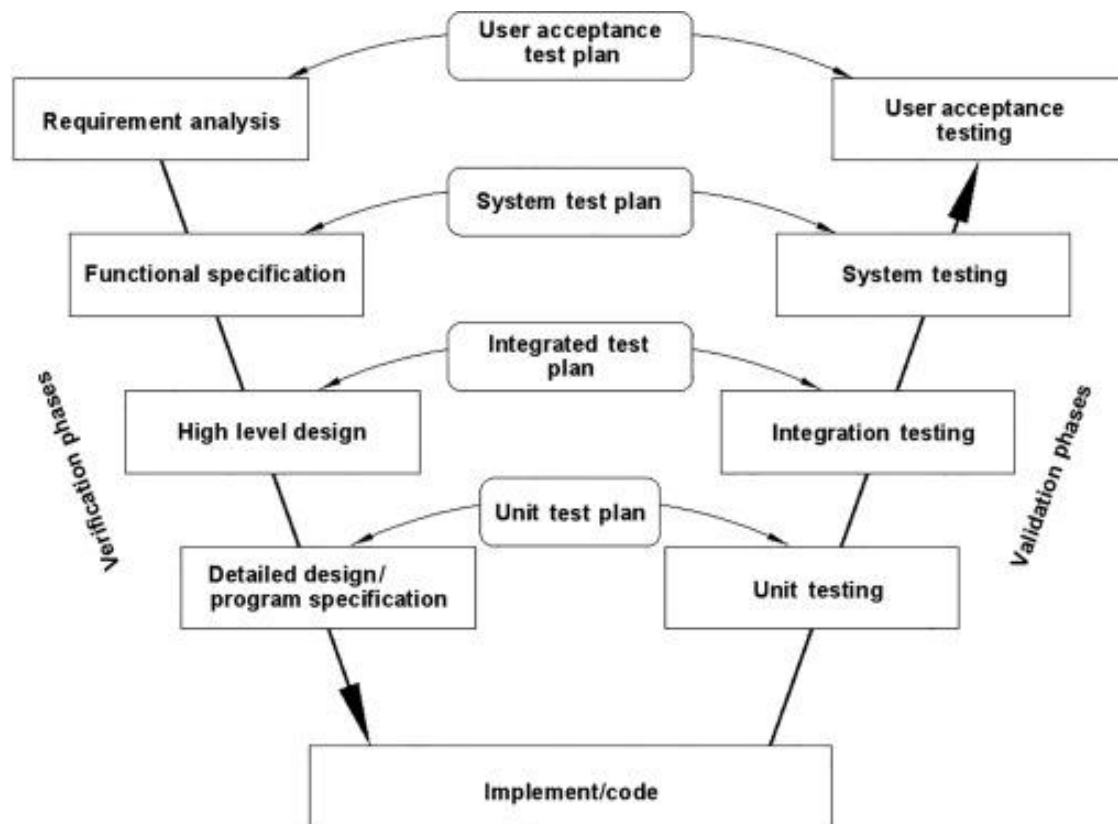

Verification and Validation Model (V-V Model) (V Model):
Software will be divided into modules
   EG: for gmail
       modules can be login, send email

Testing is done at every step.

User acceptance
test plan

Requirement analysis

User acceptance
testing

System test plan

Functional specification

System testing

Integrated test
plan

High level design

Integration testing

Unit test plan

Detailed design/
program specification

Unit testing

Verification phases

Validation phases

Implement/code

Verification
- BRS/CRS/URS (Business related Documents)
- SRS (Software Requirement Specification)
- HLD (High Level Design)
- LLD (Low Level Design)
- Coding

Validation
- Unit Testing
- Integration Testing
- System Testing
- User Acceptance Testing

Static Testing:
Testing project related documents is called static testing.

- Review
- Walkthrough
- Inspection

Dynamic Testing:
Testing the actual software.

White Box Testing
  - Unit Testing
  - Integrated Testing
Black Box Testing
  - System Testing
  - UAT Testing

Verification
- Verification checks whether we are building the right product
- Focus on Documentation

Static testing techniques are used for verification.
- Reviews
- Walkthrough
- Inspection

Validation
- Validation checks whether we are building the product right
- Takes place after verifications are completed
- Focus on Software
- Validation typically involves actual testing
- Unit testing, integration, system testing, UAT Testing

Dynamic testing techniques are used for Validation

White Box Testing
  - Unit Testing

- Integrated Testing

Black Box Testing
- System Testing
- UAT Testing

Advantages:
- Testing is involved in every step.

Disadvantages:
- Documentation is more.
- Initial investment is more.

Static Testing:
Testing project related documents is called static testing.

Review:
Conducts on documents to ensure correctness and completeness

Types:
- requirements Reviews
- Design Reviews
- Code Reviews
- Test plan Reviews
- Test cases Reviews

Walkthrough: (discussion with peers)
- It is an informal review.
- Author reads the documents or code and discussion with peers.
- It's not pre-planned and can be done whenever required.
- Also Walkthrough does not have minutes of the meet.

Inspection
- It's a most formal review.
- In which at least 3-6 people will sit in the meeting.
  1. reader (author of the document)
  2. writer (note down questions and clarification discussed in the meeting)
  3. moderator (organizer of the meeting)
  plus concerned
- Inspection will have a proper schedule which will be intimated via email to the concerned developer/tester.