Overview

Manual Testing – Fundamentals of Software Testing part –I

○ **What is Testing Why Testing ?**
Definition of Software, Software Testing, Quality and need of Testing

○ **Software Development life Cycle (SDLC)?**
SDLC and SDLC Models Waterfall, vvmodel, Agile etc.

○ **Software Testing Types**
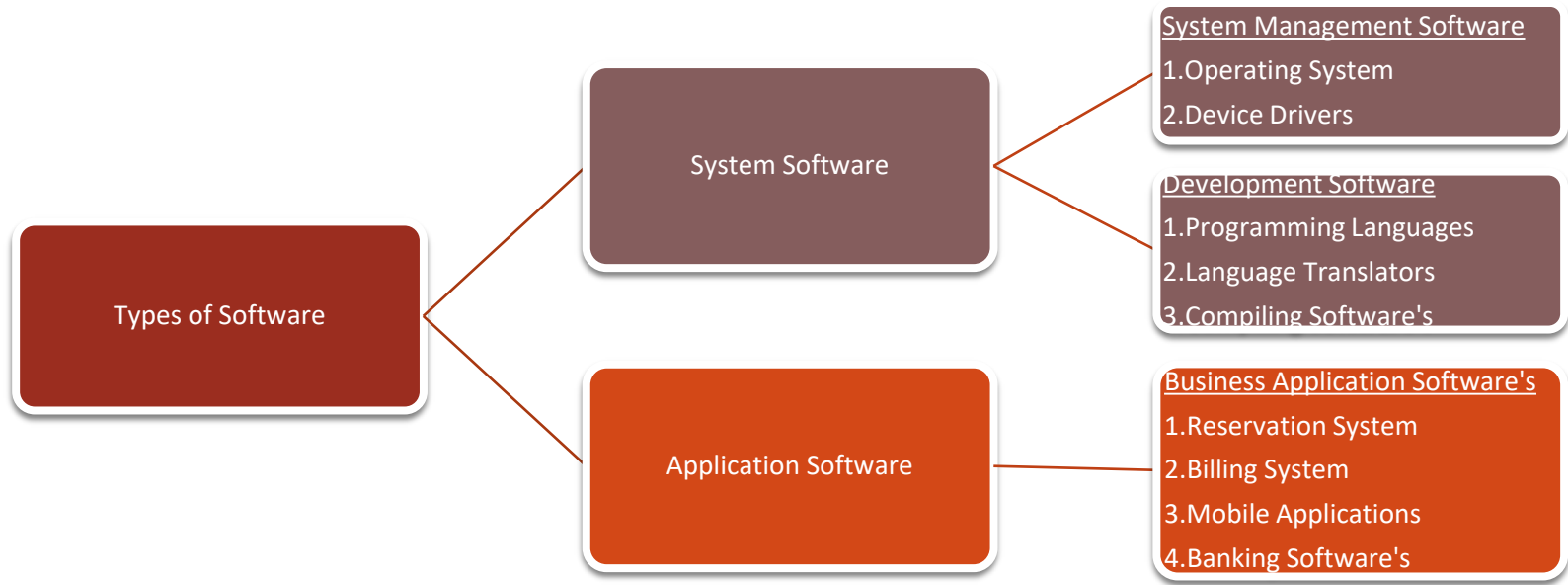Black Box , White Box , Regression , Functionally Smoke and Sanity Testing, Performance Testing Etc

What is software Testing and Why software Testing

What is **Software** ?

Set of instructions or programs instructing a computer to do specific tasks.

Types of Software

System Software

System Management Software
1. Operating System
2. Device Drivers

Development Software
1. Programming Languages
2. Language Translators
3. Compiling Software's

Application Software

Business Application Software's
1. Reservation System
2. Billing System
3. Mobile Applications
4. Banking Software's
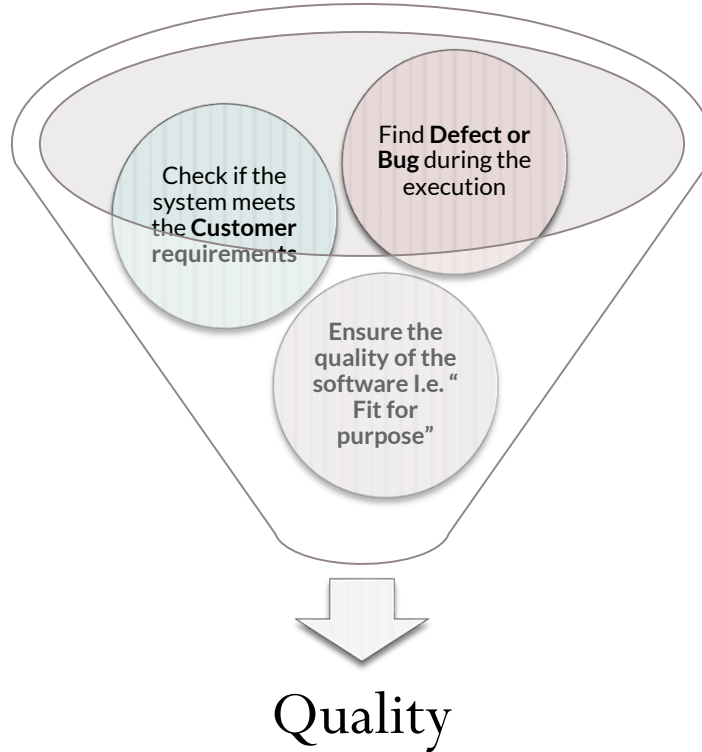
What is Quality?

Customer Satisfaction or **"fitness for use"**

Bug Free

"Conformance to requirements"

What is **Software Testing ?**

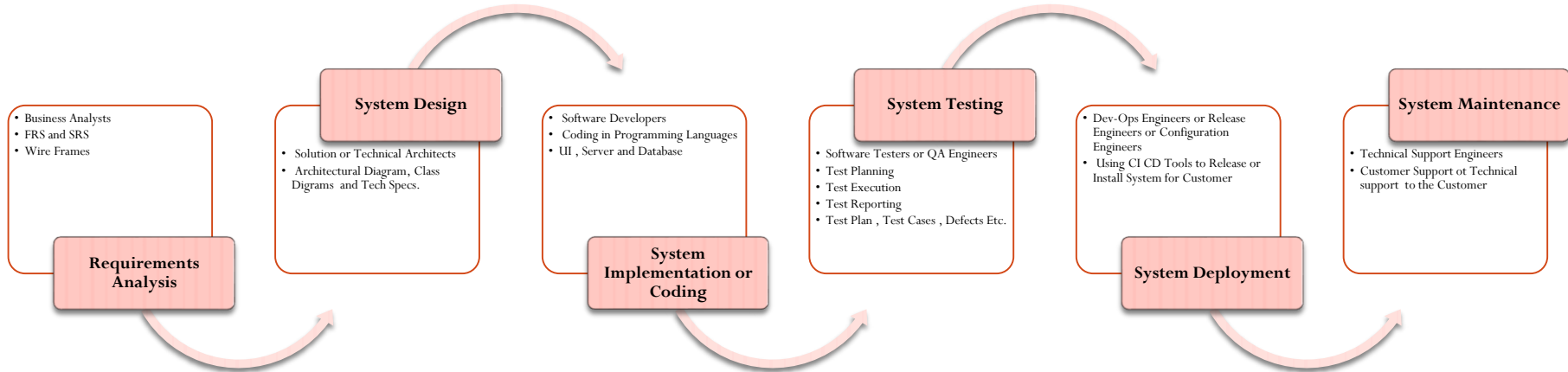Software Testing is a Process executed to achieve the quality !

Check if the system meets the **Customer** requirements

Find **Defect or Bug** during the execution

Ensure the quality of the software I.e. " Fit for purpose"

Quality

Software Development life Cycle (SDLC)

What is SDLC ?

Software Development Lifecycle

Requirements Analysis
- Business Analysts
- FRS and SRS
- Wire Frames

System Design
- Solution or Technical Architects
- Architectural Diagram, Class Digrams and Tech Specs.

System Implementation or Coding
- Software Developers
- Coding in Programming Languages
- UI , Server and Database

System Testing
- Software Testers or QA Engineers
- Test Planning
- Test Execution
- Test Reporting
- Test Plan , Test Cases , Defects Etc.

System Deployment
- Dev-Ops Engineers or Release Engineers or Configuration Engineers
- Using CI CD Tools to Release or Install System for Customer

System Maintenance
- Technical Support Engineers
- Customer Support ot Technical support to the Customer

Introduction to SDLC models ?

Software Development Lifecycle Models
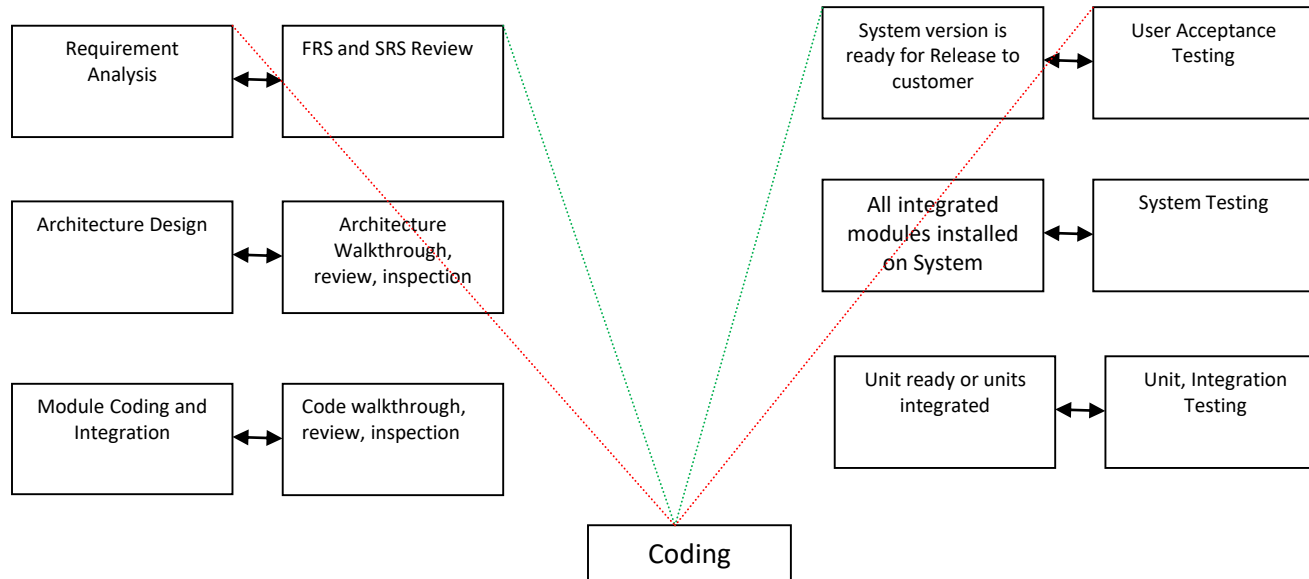
- VV model
- Waterfall model
- Agile or Iterative Incremental Model
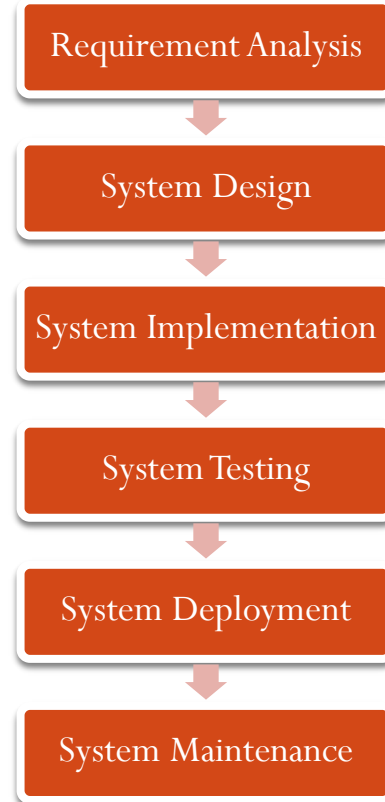- Spiral Model
- Big Bang Model

VV model

Verification	Validation
Human based static checking of documents and files. - Uses methods like inspections, reviews, walkthroughs, and Desk-checking etc.	It is computer based dynamic execution of program- Uses methods like black box (functional) testing, gray box testing, and white box (structural) testing etc.
Quality Assurance	Quality Control

Requirement Analysis	◄►	FRS and SRS Review		System version is ready for Release to customer	◄►	User Acceptance Testing
Architecture Design	◄►	Architecture Walkthrough, review, inspection		All integrated modules installed on System	◄►	System Testing
Module Coding and Integration	◄►	Code walkthrough, review, inspection		Unit ready or units integrated	◄►	Unit, Integration Testing

Coding

Waterfall model

Software Development Lifecycle Models

Waterfall model

Software Development Lifecycle Models
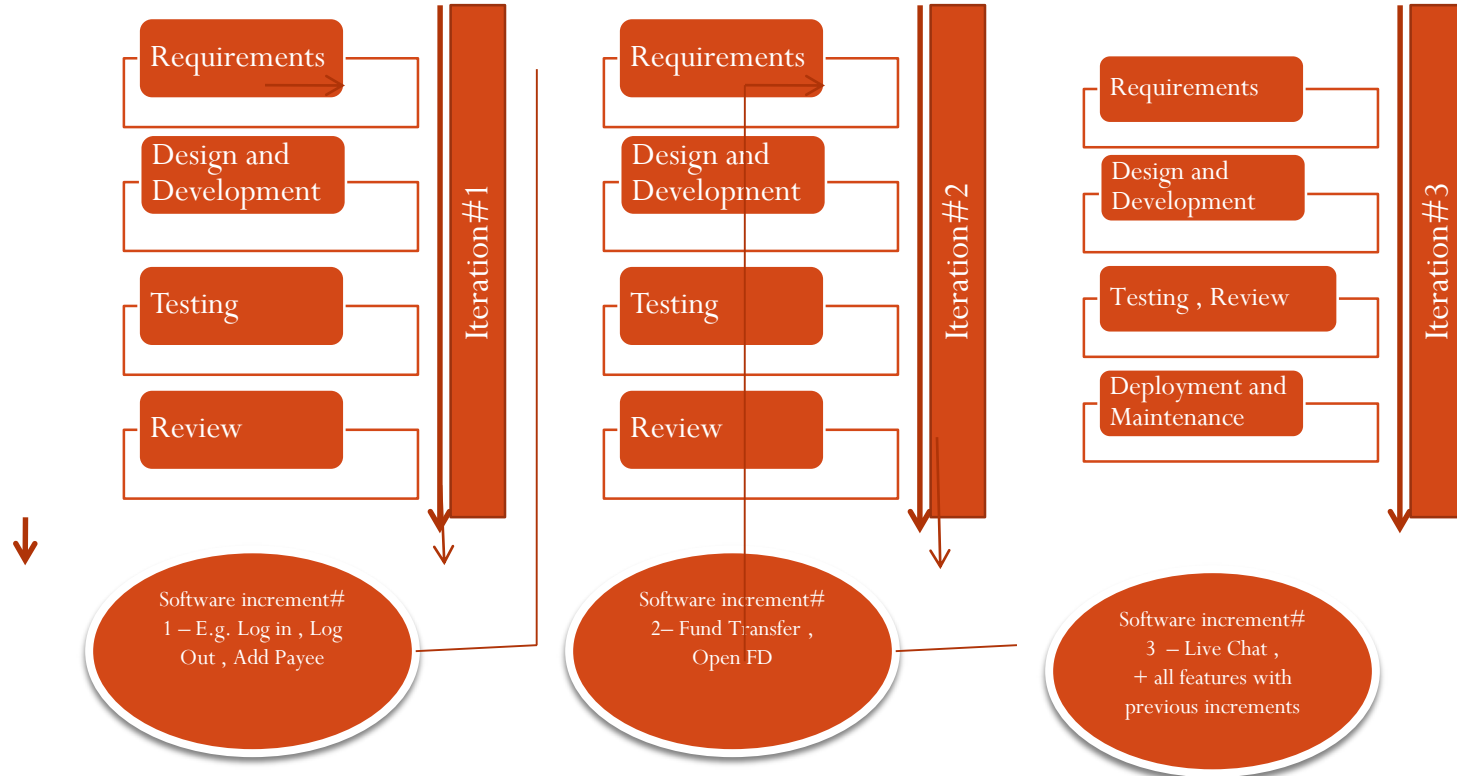
Advantages	Disadvantages

• Fix and planned Schedule
• Each phase is controlled
• Each phase progress through enough understanding and explanation
• Each phase has testing or review process
• No overlapping of phases
• Works well for small projects
	• Difficult to estimate – Cost and Time
	• When testing find defects in product concepts it is difficult to go back
	• Resource utilization is poor
	• Cost is High
	• Not good for :
	  • Complex projects
	  • High Risk of Requirement changing

Agile model or Iterative incremental model

Software Development Lifecycle Models

Agile model or Iterative incremental model

Software Development Lifecycle Models

Advantages

- Faster Development and Delivery
- Flexible in Changing the Requirements
- Less costly
- Effective utilization of resources
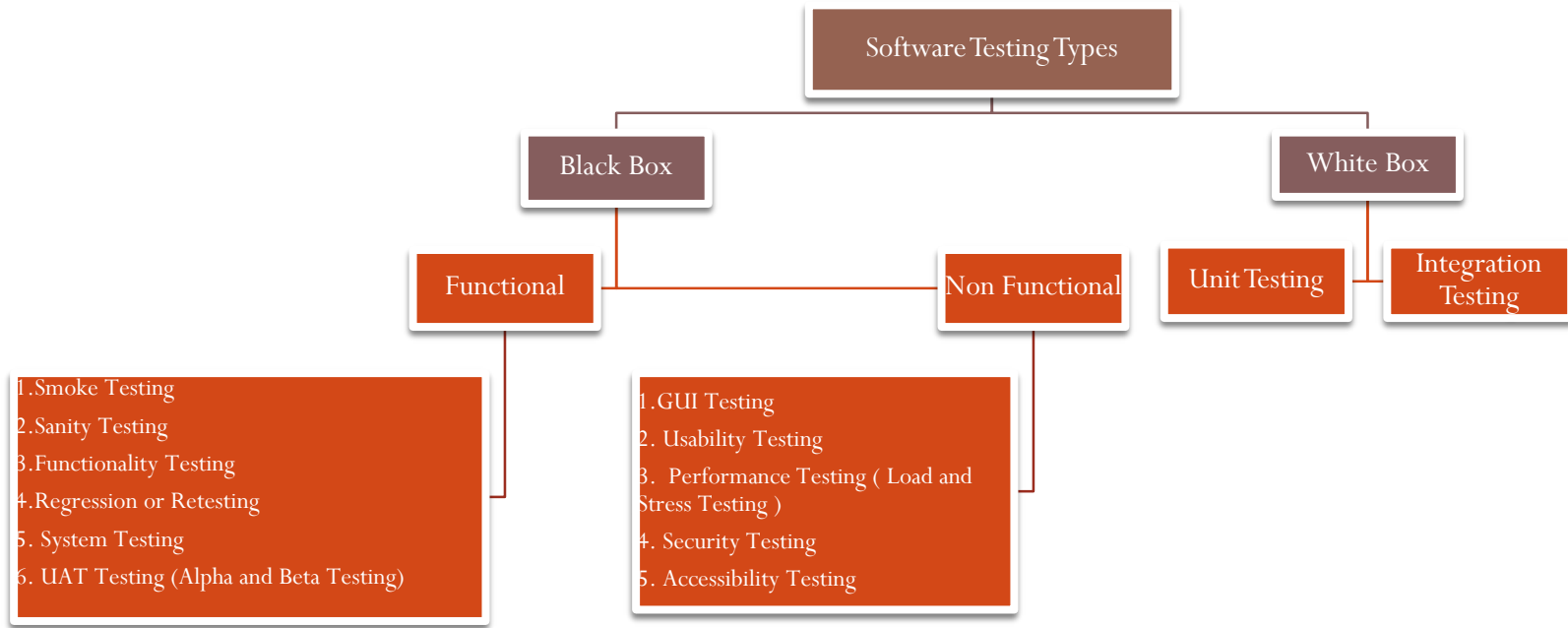- Continuous Customer Feedback

Disadvantages

- Requires good planning and design
- In case requirement change requires Architecture changes in the latter phase then it becomes difficult to accommodate
- Needs Experienced and grown-up Team

Software Testing Types

Software Testing Types

Unit testing

Software Testing Phases

- Testing of Smallest Testable part of the software
- Smallest Part – Class , Stored Procedure etc.
- Usually done by Developer
- Provide set of Inputs and check that output is as expected
- This is performed prior to Integration Testing

Code coverage report for **app/form_validator.js**

Statements: **100%** (8 / 8) Branches: **100%** (4 / 4) Functions: **100%** (3 / 3) Lines: **100%** (8 / 8) Ignored: none

All files » app/ » form_validator.js

```
 1    1 var isValidCommaDelimitedList = function (value) {
 2        // allow letters, commas, and spaces
 3   10   var commaDelimitedListRegEx = /^[A-Za-z,\s]+$/;
 4   10   return commaDelimitedListRegEx.test(value);
 5      };
 6
 7
 8    1 var isValidTagmode = function (value) {
 9    7   return value === 'all' || value === 'any';
10      };
11
12
13    1 var hasValidFlickrAPIParams = function (tags, tagmode) {
14    6   return isValidCommaDelimitedList(tags) && isValidTagmode(tagmode);
15      };
16
17
18    1 module.exports = {
19        isValidCommaDelimitedList: isValidCommaDelimitedList,
20        isValidTagmode: isValidTagmode,
21        hasValidFlickrAPIParams: hasValidFlickrAPIParams
22      };
23
```

Integration Testing

Software Testing Phases

✤Focuses mainly on the interfaces & flow of data/information between the modules

✤ Modules are Integrated and tested by two incremental approaches

TOP DOWN

Unit 1

Unit 2

Unit 3

Unit 4

Unit 5

Unit 6
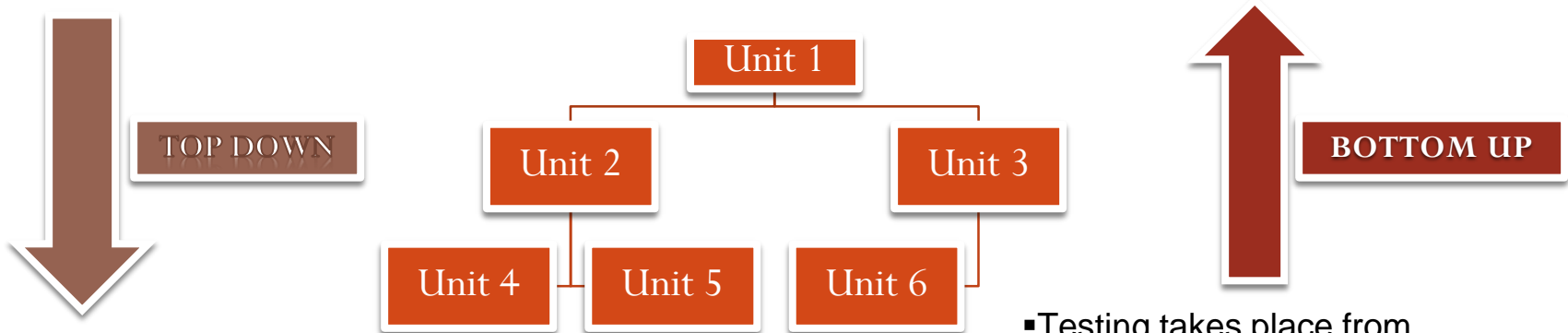
BOTTOM UP

▪Testing takes place from top to Bottom

▪Takes help of stubs(mock down side Units.)

▪Testing takes place from Bottom to Top

▪Takes help of Drivers(mock Top side Units.)

Smoke and Sanity Testing

Software Testing Phases

- Smoke test performed to quickly check Build Helth
- Sanity Test is performed to check helth of important bits and pieces of the same build i.e. wide but small-minded testing.
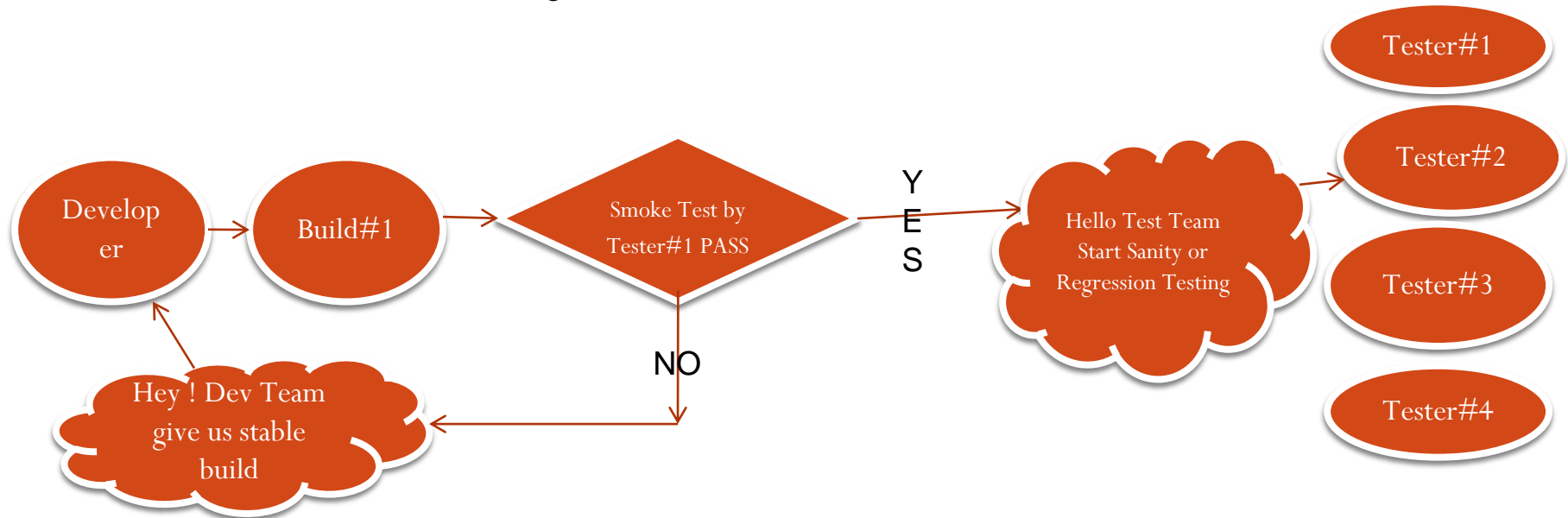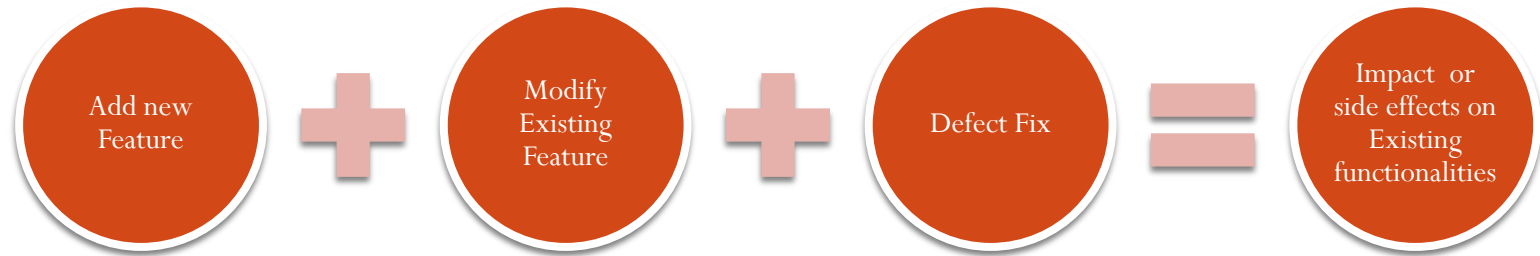
Functional Testing

🞣 ***Functional Testing*** verifies that each function of the software application operates as per the ***requirement specification***.
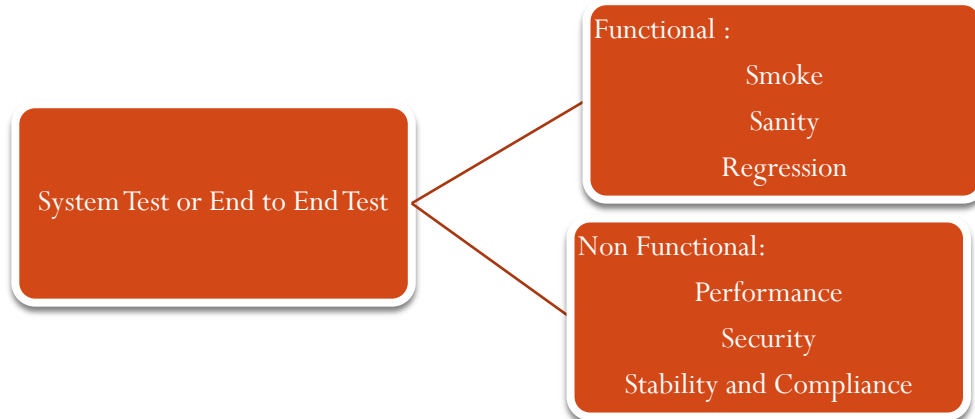
Regression Testing

Software Testing Phases

Testing and Retesting of a software system to confirm that changes made to few parts of the codes has not any side affects on existing system functionalities

System Testing
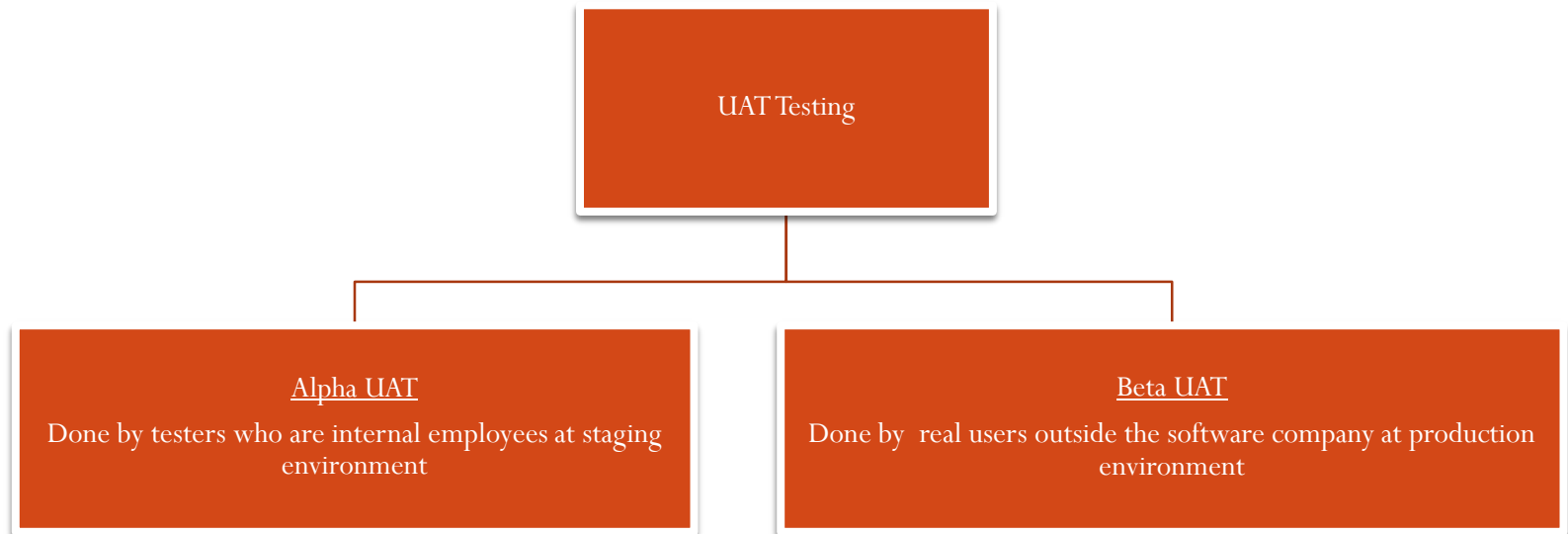
⚜ System testing, the functionalities of the system are tested from an end-to-end perspective.
⚜System Testing is usually carried out by a team that is independent of the development team in order to measure the quality of the system unbiased.
⚜It includes both functional and Non-Functional testing.

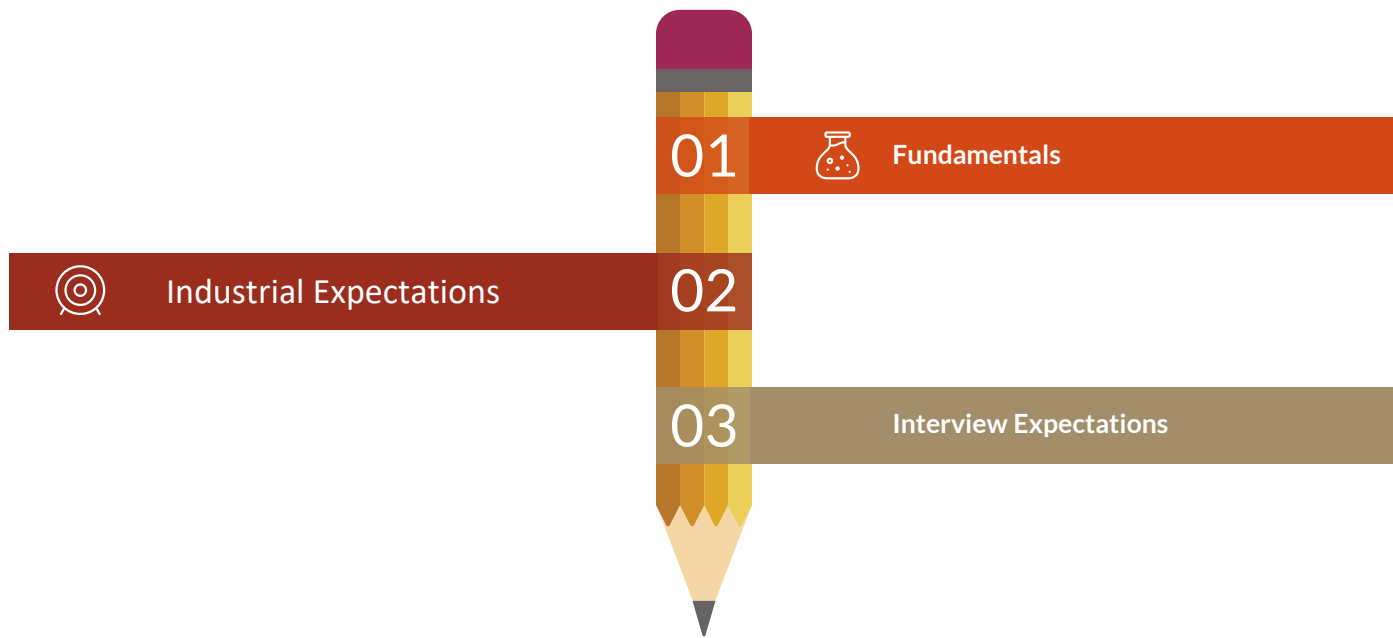Functional :
Smoke
Sanity
Regression

System Test or End to End Test

Non Functional:
Performance
Security
Stability and Compliance

UAT Testing

Software Testing Phases

- Developers may develop something which is not same as specified in requirement
- There can be communication gap or inappropriate requirements
- User Acceptance Testing is done by Client to certify the system

UAT Testing

Alpha UAT

Done by testers who are internal employees at staging environment

Beta UAT

Done by real users outside the software company at production environment

Content

01 Fundamentals

02 Industrial Expectations

03 Interview Expectations

Recap

01 What is software Testing and Why software Testing
Software , Software Testing , Why Testing

02 Software Development life Cycle (SDLC)
SDLC , vv model ,Waterfall , Agile , Spiral , Big Bang

03 Software Testing Types
White Box : Unit , Integration
Black Box - Smoke , Sanity , Functional , Regression , System, UAT (Alpha and Beta) ,

Now

Next

01 Software Testing Techniques
White Box and Black Box Testing Techniques

02 Test Artifacts
Test Planning , Test Case writing and Execution , Defect Tracking and Test Reporting

03 STLC
Software Testing Lifecycle

Any questions?