# SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## COURSE NAME : 19CS511  SOFTWARE TESTING

III YEAR / V  SEMESTER

Unit 1- INTRODUCTION

Topic 2:  Software Testing Fundamental and  Testing Maturity Model

# Software Testing Fundamental and Testing Maturity Model -**Problem**

How can these **software testing maturity levels** help a company to plan and implement an automated **software test** program?

# Software Testing Fundamental

## ❏ Definition of Software Testing

❏ Software Testing is evaluation of the software against requirements gathered from users and system specifications. Testing is conducted at the phase level in software development life cycle or at module level in program code.

❏ Software testing comprises of Validation and Verification.

(OR)

❏ The process consisting of all lifecycle activities, both static and dynamic, concerned with planning, preparation and evaluation of a component or system and related work products to determine that they satisfy specified requirements, to demonstrate that they are fit for purpose and to detect defects.

# Why Software Testing?

**Software that does not work correctly can lead to many problems such as:**

☐ Delay / Loss of time

☐ Futility / Loss of effort

☐ Wastage / Loss of money

☐ Shame / Loss of business reputation

☐ Injury or death

**Case Study :** In April 2015, Bloomberg terminal in London crashed due to software glitch affected more than 300,000 traders on financial markets. It forced the government to postpone a 3bn pound debt sale.

Nissan cars recalled over 1 million cars from the market due to software failure in the airbag sensory detectors. There has been reported two accident due to this software failure.

# Software Testing Goals

**The three main goals of Software Testing are:**

**Defect Detection:** Find defects / bugs in the software during all stages of its development (earlier, the better).

**Defect Prevention:** As a consequence of defect detection, help anticipate and prevent defects from occurring at later stages of development or from recurring in the future.

**User Satisfaction:** Ensure customers / users are satisfied that their requirements (explicit or implicit) are met.

# Role of Software Testing

Rigorous testing is necessary during software development and maintenance to

Identify defects

Reduce failures in the operational environment

Increase quality of the operational system.

meet contractual or legal requirements

Meet industry-specific standards, which may specify the type of techniques that

must be used or the percentage of the software code that must be executed.

# Software testing comprises of Validation and Verification.

## Software Validation

Validation is process of examining whether or not the software satisfies the user requirements. It is carried out at the end of the SDLC. If the software matches requirements for which it was made, it is validated.

Validation ensures the product under development is as per the user requirements.

Validation answers the question – "Are we developing the product which attempts all that user needs from this software ?".
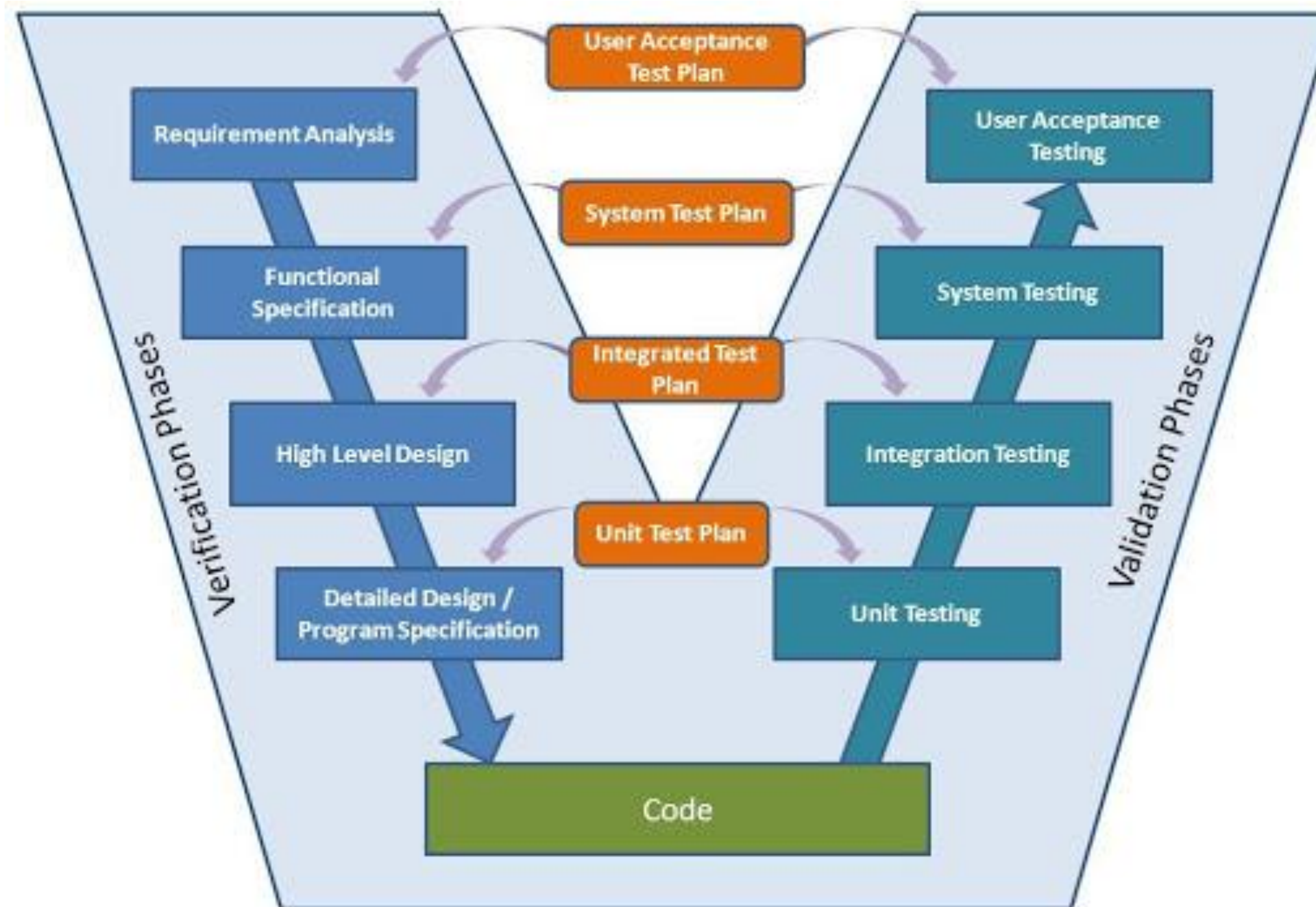
Validation emphasizes on user requirements.

# Software testing comprises of Validation and Verification. Cont..

## Software Verification

Verification is the process of confirming if the software is meeting the business requirements, and is developed adhering to the proper specifications and methodologies.

Verification ensures the product being developed is according to design specifications.

Verification answers the question– "Are we developing this product by firmly following all design specifications ?"

Verifications concentrates on the design and system specifications.

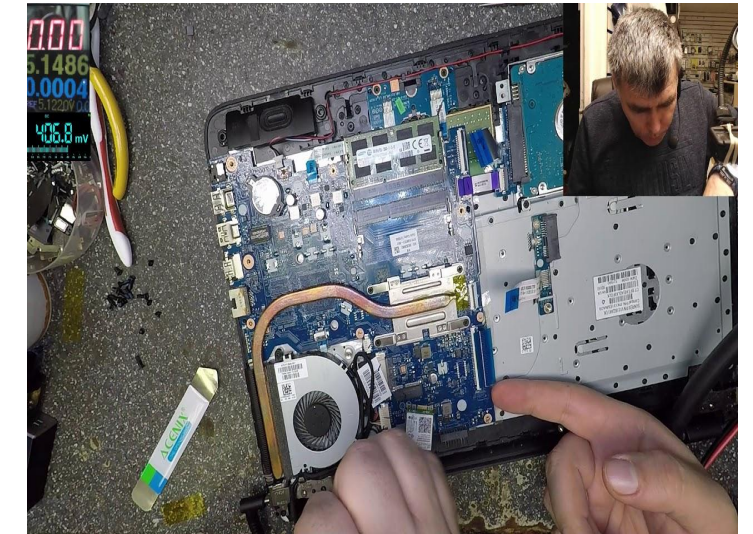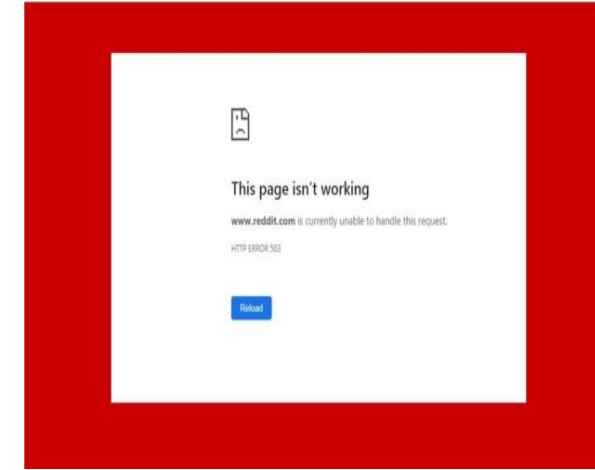# Software testing comprises of Validation and Verification. Cont..

# Target of the test are

**Errors** - These are actual coding mistakes made by developers. In addition, there is a difference in output of software and desired output, is considered as an error.

**Fault** - When error exists fault occurs. A fault, also known as a bug, is a result of an error which can cause system to fail.

**Failure** - failure is said to be the inability of the system to perform the desired task. Failure occurs when fault exists in the system.
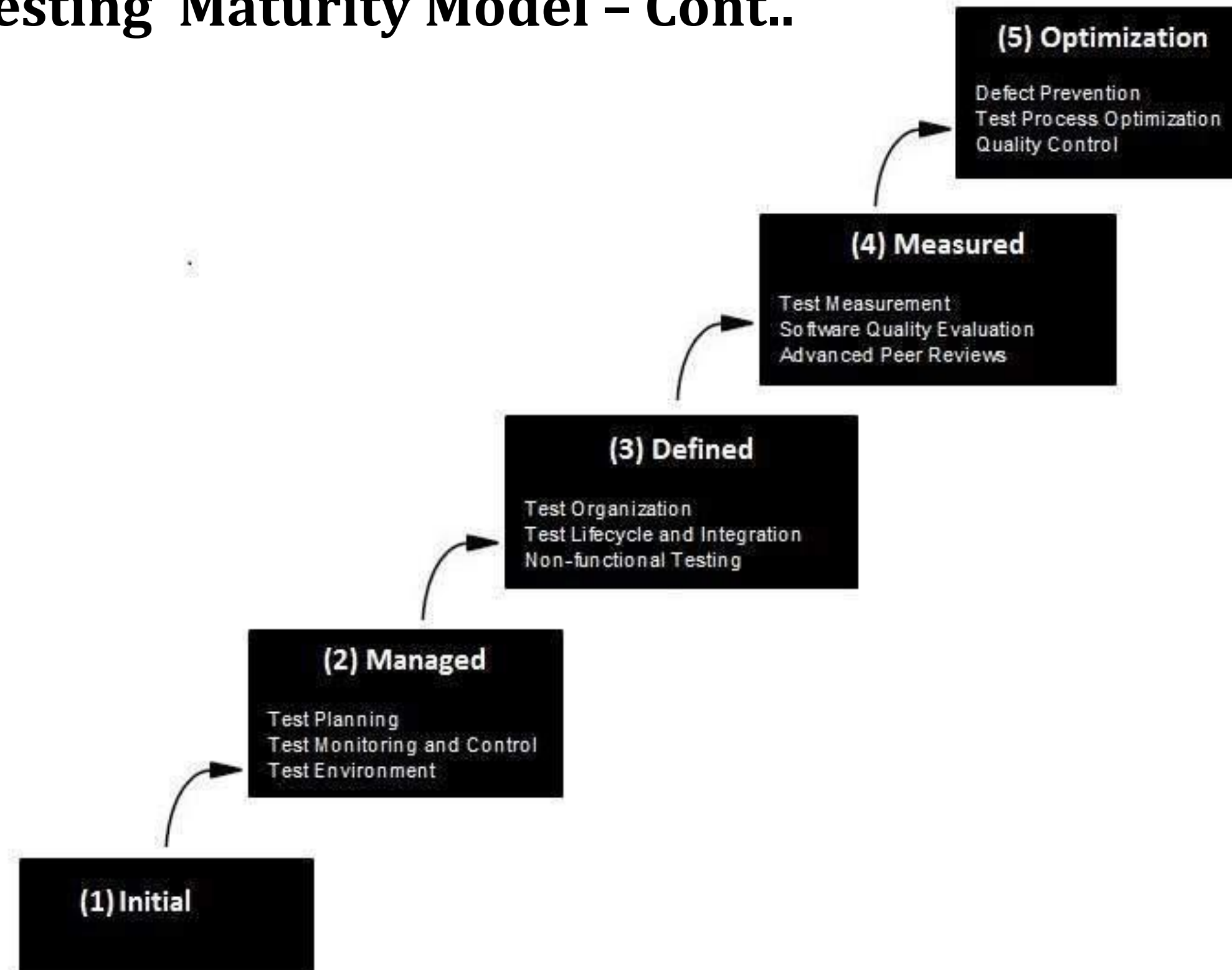
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## What is a Test Maturity Model?

Test maturity model is based on capability maturity model specifies an increasing series of levels of a software development organization. The higher the level, the better the software development process, hence reaching each level is an expensive and time-consuming process.

# Testing Maturity Model – Cont..



**(5) Optimization**
Defect Prevention
Test Process Optimization
Quality Control

**(4) Measured**
Test Measurement
Software Quality Evaluation
Advanced Peer Reviews

**(3) Defined**
Test Organization
Test Lifecycle and Integration
Non-functional Testing

**(2) Managed**
Test Planning
Test Monitoring and Control
Test Environment

**(1) Initial**

# Activity

# Disadvantages

 Appropriate communication and coordination with the tester

Competition among similar service providers

Lack of experienced professionals

Finding the right service provider

# Advantages

**Cost-Effective**

**Security**

**Product quality**

**Customer Satisfaction**

# Assessment 1

1. List out the Advantages of Software testing fundamentals

   a)_____

   b)_____

   c)_____

   d)_____

2. Identify the Disadvantages of Software testing fundamentals

   a)_____

   b)_____

   c)_____

   d)_____

*

**TEXT BOOKS:**

1. Ricardo Baeza-Yates and Berthier Ribeiro-Neto, ―Modern Information Retrieval: The Concepts and Technology behind Search, Second Edition, ACM Press Books, 2011.

2. Ricci, F, Rokach, L. Shapira, B.Kantor, ―Recommender Systems Handbook‖, First Edition, 2011.

**REFERENCES:**

1. C. Manning, P. Raghavan, and H. Schütze, ―Introduction to Information Retrieval, Cambridge University Press, 2008.

2. Stefan Buettcher, Charles L. A. Clarke and Gordon V. Cormack, ―Information Retrieval: Implementing and Evaluating Search Engines, The MIT Press, 2010.

# THANK YOU