

Unit Test – Unit 1

Software testing and Quality Analysis

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Q1. What is Software testing?

Software Testing is the process of evaluating a system or its components with the intent to find whether it satisfies the specified requirements or not. It is executing a system to identify any gaps, errors, or missing requirements in contrary to the actual requirements. It is also important since it discovers defects/bugs before the delivery to the client, which guarantees the quality of the software. It makes the software more reliable and easier to use. Thoroughly tested software ensures reliable and high-performance software operation.

Q2. What are the benefits of Software testing?

Cost-Effective:

It is one of the important advantages of software testing. Testing any IT project on time helps you to save your money for the long term. In case if the bugs caught in the earlier stage of software testing, it costs less to fix.

Security:

It is the most vulnerable and sensitive benefit of software testing. People are looking for trusted products. It helps in removing risks and problems earlier.

Product quality:

It is an essential requirement of any software product. Testing ensures a quality product is delivered to customers.

Customer Satisfaction:

The main aim of any product is to give satisfaction to their customers. UI/UX Testing ensures the best user experience.

Q3. What is Error, Defect, Fault and failure.

Defect

A software bug arises when the expected result doesn't match with the actual results. It can also be error, flaw, failure, or fault in a computer program. Most bugs arise from mistakes and errors made by developers, architects. Some common types of defects are Arithmetic Defects Logical Defects, Syntax Defects, Multithreading Defects, Interface Defects and Performance Defects.

Error

When the system produces an outcome, which is not the expected one or a consequence of a particular action, operation, or course, is known as error.

Error or mistake leads to a defect and usually arises due to various reasons. It may be a system specification issue or design issue or coding issue, which leads to a defect. Error leads to defects and if the defect is uncovered by QA leads to Failure.

Failure

Under certain circumstances, the product may produce wrong results. It is defined as the deviation of the delivered service from compliance with the specification.

Fault

Fault is basically a human error made unintentionally during the software development cycle. It leads to a defect and usually arises due to various reasons.

Q4. Define Total Quality Management

Total Quality Management (TQM) can be defined as a management technique for improving processes, products, services, and the other approaches associated with the product. It focuses on the entire business and NOT just on a project or process.

Elements of TQM are following below:

- Root Cause Analysis
- Customer-focused
- Active Employee Participation
- Process-oriented
- Internal and External self-Assessment
- Continuous improvement
- Making Well Informed Decisions
- Effective Communication

Q5. What are the internal and external characteristics of quality?

Internal and external characteristics are as follows:

1. Functionality
 - Suitability
 - Accuracy
 - Interoperability
 - Security
 - Functionality compliance
2. Reliability
 - Maturity
 - Fault tolerance
 - Recoverability

- Reliability compliance
3. Usability
 - Understandability
 - Learnability
 - Operability
 - Attractiveness
 - Compliance
 4. Efficiency
 - Time Behaviour
 - Resource utilisation
 - Efficiency compliance
 5. Maintainability
 - Analysability
 - Changeability
 - Stability
 - Testability
 - Compliance
 6. Portability
 - Adaptability
 - Install ability
 - Co-existence
 - Replaceability
 - Compliance

Q6. Test cases are designed during which stages.

The Test case development begins once the test planning phase is completed. This is the phase of STLC where testing team notes the detailed test cases. Along with test cases, testing team also prepares the test data for testing. Once the test cases are ready then these test cases are reviewed by peer members or QA lead.

A good test case is the one which is effective at finding defects and also covers most of the scenarios on the system under test.

Q7. What is fault masking?

Fault Masking is an occurrence, in which one defect prevents the detection of another, there are two perspectives to understand the fault masking.

A Show-stopper defects simply clarify the fault masking, if you test a Login form consist from two data fields, "Login" and "Cancel" buttons, and "Remember me" check box, when press "Login", an unhandled exception fires, so if the "Remember me" check box didn't work you will never know until a successful Login process has been done.

Technically It's a used technique (by developers) to prevent error result from appearing.

Q8. Skills required by tester.

Following are the basic skills required to be tester

- Written and verbal communication
- Problem solving
- Active listening
- Observations
- Testing skills ie.
Concept of testing, levels of testing, Techniques for verification and validation, selection and using of testing tool, knowledge of testing stand.
- Client's perspective approach
- Creativity and innovation
- Continuous improvement
- Prioritizing of workflow

Q9. Identify Problematic Area of SDLC

Problematic areas of SDLC are as follows:

- No time allocated for good design and architecture
- Code becomes unreadable and unmaintainable
- Code is disorganized limiting amount of software engineers and/or changes to be active at any time.
- Makes full and patch releases difficult or impossible without severe downtime or refactoring of code.
- Simple configuration or system administration requires a code change not variable/parameter change.
- Makes change extremely difficult – not scalable or object orientated.
- Duplication of solutions i.e. not sharing such as application and hardware servers
- Makes releases extremely difficult i.e. No thought how to release the project – to many manual processes in a release. Releases take several hours and even days. Build an object too large to get through the door.
- Lack of necessary documentation or too much unnecessary documentation
- No or very little enterprise development, testing, or security standards
- Non-technical staff getting involved in making technical decisions causes the two most common features in struggling and/or failing technology projects:
- Pressure from business to implement change fast. Management scheduling without understanding impact and risk
- Inability of IT to explain and the business to understand the intricate nature of technology projects.

Q10. Describe Pillars of Quality Management System

The 5 Pillars of a Modern Quality Management System include:

- Integrated Processes
- System Flexibility
- Monitoring and Management
- Compliance Enablement
- Culture of Quality and Compliance

Pillar 1: Process Integration

While most companies execute on these functions, the degree of integration and automation varies greatly from company to company. The concern of the first pillar is how well these processes are integrated together. For example, if the Customer Complaint process is completely separated from the Corrective Action process, then there is room for improvement.

Pillar 2: System Flexibility and Extensibility

Unfortunately, no one can predict what the future holds. Being able to adapt and continuously innovate is extremely important. In summary, the second pillar is all about connectivity, expandability, and configurability.

Pillar 3: Centralized Monitoring and Management

A best of breed enterprise quality management system should provide the following capabilities:

- Alerts & Notifications
- Reporting
- Measurements & KPIs
- Management Dashboards

Pillar 4: Compliance Enablement

Almost all industries have regulatory standards and requirements. A modern enterprise quality management system should have compliance built into the system. Compliance should not be an afterthought.

Pillar 5: Culture of Quality & Compliance

Establishing a culture of quality and compliance, perhaps the most important quality management pillar, shows a commitment from the top that flows down throughout the rest of the organization. A quality system, no matter how well designed, cannot work if there is no visible management buy-in.