# CHAPTER SIX

# TESTING

## 6.1: Testing in Software Engineering

Testing is an activity that is used to discover errors and correct them, so that we are able to create a defect-free product for our customer or user. Testing is an important phase in the software development life cycle. The objective of testing is to evaluate if we have created the system correctly. During the earlier stages, the focus was to check what is being built but in testing when we have the end product ready, our focus shifts to validate whether the product that has been built has been built correctly or not. Hence, the focus shifts from building the product right to building the right product. [1]

There are two basic types of software testing, which are black box testing and white box testing. General testing process for large system development starts with the testing of individual program units such as functions, classes or objects. These are then integrated into sub-system and systems, and the interactions of these units were tested. Finally after delivery of the system, the customer may carry out a series of acceptance tests to check that the system performs as specified. [2]

Whereas, for smaller system or for system that are developed through scripting or reuse, there are often fewer distinct stages in the process.

The two fundamental testing activities are component testing, testing the parts of the system – and system testing, testing the system as a whole. [2]

## 6.2: Goals and Types of Testing

Basically, there are two distinct goals of the software testing process:

* To demonstrate to the developer and the customer that the software meets its requirements.
* To discover faults or defects in the software where the behavior of the software is incorrect, undesirable or does not conform to its specification.

The first goal, where you expect the system to perform correctly using a given set of test cases that reflect the systems expected use, leads to validation testing. The second goal leads to defect testing, where the test cases are designed to expose defects. The main types of testing approaches are defined below: [2]

### 6.2.1: System Testing

System testing involves integrating two or more components that implement system functions or features and then testing this integrated system. For most complex systems, there are two distinct phases to system testing – Integration Testing and Release Testing. As for the Web Based Payroll System, the system had to go through both Integration and Release testing.

#### 6.2.1.1: Integration Testing

Integration testing is mostly concerned with finding defects in the system, where the test team has access to the source code of the system. If the problem is discovered, the team goes through the source code to find the components that have to be debugged. [2]

Integration testing was done after every unit or feature being added to the system. For example, if the current has three features (show payroll chart, overtime chart, total hours worked chart), when the fourth feature, unit, or component if being attached or added to the system, integration testing had to be done throughout although there are still many units or components to be added to the system.

#### 6.2.1.2: Release Testing

In release testing that version of the system is tested that could be released to users or customers. The test team here validates if the system meets its requirements and also ensures system dependability. It is usually black-box testing where the test team is simply concerned with demonstrating the system does or does not work properly. If problems discovered are then