

Development

This phase is where the system starts to be written by the software programmers. They follow the requirements specification from the design stage and start to create the new system.

The main things that take place during this phase are:

- The programmers write and test the code for the system
- A team ensure that the hardware and software required to run the new system are purchased and in place.
- A team of testers are assembled in readiness to test the new system. They start to write a test plan which details all of the tests that they will carry out.

Testing

Once the system has been coded, it needs to be thoroughly tested by a team of testers. A test plan will have been written whilst the system is being developed.

The Importance of Testing and Having a Test Plan

Testing is necessary because no programmer or developer is perfect and errors are to be expected. These errors need to be found and rectified. It is important to ensure that the system is error free so that the users can use the system knowing that it will work reliably and behave as expected.

A **test plan** will identify all the tests that are needed for every input, every button, every link, every report, every screen and all other elements of a system.

The test plan will include different types of test data including;

- Normal
- Abnormal, and
- Extreme

These tests will ensure that inputs are tested to their limits.

Type of Test Data	Description
Normal data	Data that will be accepted by the validation rule.
Abnormal data	Data that will not be accepted by the validation rule.
Extreme data	Data that will only just be accepted by the validation rule because it is at the limit of acceptability.

A test plan will identify what is being tested, the type of test, the input data that should be used to test it, the expected result of the test. As well as inputs, it is important to test that all calculations work as expected.

In order to test the system, data has to be created that will be used for the purpose of testing. This is known as **test data**.

There will need to be enough test data generated to ensure that the system is able to cope under the pressures of large amounts of data in everyday use.

Alpha Testing

- ✓ Alpha testing is a type of acceptance testing; performed to identify all possible issues/bugs before releasing the product to everyday users or the public.
- ✓ The aim is to carry out the tasks that a typical user might perform.
- ✓ Alpha testing is carried out in a lab environment and usually, the testers are internal employees of the organization.
- ✓ This kind of testing is called alpha only because it is done early on, near the end of the development of the software, and before beta testing.

Beta Testing

- ✓ Beta Testing of a product is performed by "real users" of the software application in a "real environment" and can be considered as a form of external User Acceptance Testing.
- ✓ It is the final test before shipping a product to the customers.
- ✓ Direct feedback from customers is a major advantage of Beta Testing.
- ✓ This testing helps to test the product in the customer's environment.
- ✓ Beta version of the software is released to a limited number of end-users of the product to obtain feedback on the product quality.
- ✓ Beta testing reduces product failure risks and provides increased quality of the product through customer validation.

Black Box Testing

- ✓ In Black box testing, a tester doesn't have any information about the internal working of the software system.
- ✓ Black box testing is a high level of testing that focuses on the behavior of the software.
- ✓ It involves testing from an external or end-user perspective.
- ✓ Black box testing can be applied to virtually every level of software testing: unit, integration, system, and acceptance.

White Box Testing

- ✓ White Box testing is done with knowledge of the internal structure of program.
- ✓ White Box testing requires programming knowledge.
- ✓ This type of testing has the main goal to test the internal operation of the system.
- ✓ It is focused on code structure, conditions, paths and branches.
- ✓ White Box testing is a time-consuming process.