Chapter 6

TESTING

Testing is defined as the process of validating if the final system developed, meets the specified requirements or not. It involves the execution of software components in order to check if it responds correctly to the given inputs and performs functions within the expected time. The two fundamental testing is component testing and system testing[15]. Component testing tests the individual components in order to test the whole system to check the functional and non-functional requirements. There are several testing steps involved before the product is given to the user acceptance test. They are:

- Unit testing
- Integration testing
- System testing

6.1 UNIT TESTING

A unit testing is a method in which the individual code segments are tested which could be a procedure or a function. Unit testing is also known as module or component testing. Goal of unit testing is to test individual components in order to check if its function properly or not. Unit testing determines the problem in the earlier phases of development from the requirement specification to the implementation phase. Each unit is tested independently before it is integrated to develop the entire system. The following unit testing table in Table 6.1 shows the different modules for which the tests were conducted. First column indicates test case id, second column indicates test description, third column indicates the expected output, fourth column indicates the actual output which is the output obtained from testing and the last column indicates whether the test case is passed or failed.

Table 6.1 Unit Testing Table

Test case ID	Test case Description	Input Data	Expected output	Actual output	Status
1	Test if the user is able to provide correct information.	Name, Mobile number, Password	Message stating "User Registered Successfully".	Message stating "User Registered Successfully"	Pass
2	Test if the Registered user is able to login	Correct mobile number and password	Redirects to the homepage.	Redirects to the homepage.	Pass
3	Test if the unregistered user is able to login	Invalid mobile number and password	User cannot log in and stay in the same page.	User cannot log in and stay in the same page.	Pass
4	Test if the user can recharge his/her mobile	Mobile number, Service Provider, Recharge amount	Message stating that "Recharge is successful"	Message stating that "Recharge is successful"	Pass
5	Test if user can set or change recharge threshold	Threshold value	Message stating that "Threshold is set or changed"	Message stating that "Threshold is set or changed"	Pass

6.2 INTEGRATION TESTING

Integration testing is done after the module testing or unit testing which involves combining the modules together to be tested as a group. The main purpose of integration testing is to test the functional and reliable requirements as specified during the design process. Test cases are constructed such that when the modules are assembled together they function properly or without any malfunctioning. Integration testing can be done in a variety of ways but the following are two common strategies:

- Big Bang
- Top down approach
- Bottom up approach

Big bang approach

In the Big Bang approach all of the working modules are combined together in order to from the entire system. Usage model testing is a type of Big bang approach where the components are integrated and tested in order to determine the technical errors occurring during integration.

Top down approach

Top down approach considers the highest level modules to be tested and integrated first. It deals with developing the overall skeleton of the system and then adding components

Bottom up approach

Bottom up approach tests the lower level components first and this is repeated until the component at the top is being tested. The bottom level components are integrated and tested. This approach also helps in determining the levels of software developed. Errors determined in the bottom up approach is more than that of top down approach.

Table 6.2 Integration testing table

Test case ID	Description	Input data	Expected output	Actual output	Status
1	Test for creating account.	Account details	Message of Successfully created customer account.	Message of Successfully created customer account.	Pass
2	Test if many users can create account.	Account details	Account is created successfully for all.	Account is created successfully for all.	Pass
3	Storing account details in database and generating id.	User details	User id is generated and user's information is stored in database.	User id is generated and user's information is stored in database.	Pass
4	Adding money to recharge wallet	User id	Money is successfully added to wallet.	Money is successfully added to wallet.	Pass
5	Test if automated recharge is done	Threshold value	Message that automated recharge is successful.	Message that automated recharge is successful.	Pass

6.3 System testing

System testing is performed on a completely integrated system which would meet the specified requirements. The main purpose of system testing is to check the problems between any of the software components. It takes all the components which have passed the integration testing. It not only checks the functionalities along with the behavior of the system. Some of the tests included in system testing are graphical user interface testing and usability testing.

In our project, we used Laravel which is a free, open-source PHP web framework, created by Taylor Otwell and intended for the development of web applications following the model–view–controller (MVC) architectural pattern.

SUMMARY

This chapter deals with several kinds of testing such as unit testing in which the accurate functioning of the particular module like the registration, login, apply and approval is tested separately. It also gives a brief detail about integration testing in which the individual proposed modules are combined and tested as a group.