**jCHAPTER THREE (4)**

**System Implementation**

**4.0 Introduction:** This chapter entails the Technical tools used, system Testing, System Requirement, System Evaluation and Chapter Summary.

**4.1 Technical tools used:** Before any software could be programmed, decisions are needed to be made on which programming language should be used. The software been a desktop application, visual studio 2019 was used as the IDE and to ensure a standardized object oriented program in its entire ramification, Python and JavaScript programming language was used, after Microsoft .Net was used to connect to the database which was created using Microsoft SQL Database. The implementation was carried out using .Net Framework with windows applications which serves as the Graphical User Interface (GUI). The software will enable user to login using his or her Login and password details. This will also enable the user to apply leave through from the app. The application was built on windows 10 operating system, with visual studio a good graphical user interface was design, then using the Python and JavaScript programming as code behind to perform all the functionalities.

|  |  |
| --- | --- |
| **CATEGORY** | **TECHNICAL TOOLS USED** |
| **OPERATING SYSTEM** | **Window** |
| **Programming Language** | **Python and JavaScript** |
| **IDE** | **Visual Studio** |
| **Framework** | **.Net** |
| **Database** | **MySQL** |

**4.2 System Testing:** The overall aim for testing a system is to ensure that the system meets all of its functional requirements and to check its performance. The accuracy of the program can be tested with some varying data, testing gives assurance that the new system will achieve its objectives and purpose. Testing is basically an attempt of executing programs to find bugs. Testing ensures the success of any program that aims at delivering a robust system. Testing consist of various types for which a system is subjected to but the ones to be carried out are the ones in the testing objectives. The test plan presents the test in details through identifying the test case areas within the system

**4.2.1 Tests Plans (for Unit Testing, Integration Testing, and System Testing)**

**Unit Testing**

1. **Login**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test ID** | **Function** | **Description** | **Expected Result** | **Actual Result** | **Status** |
| **Login** | **This test the login module with correct input to access the system** | **This test the login module with correct input to access the system** | **Allow the user to log in to the system** | **The user logged into the system** | **Pass** |
| **Login** | **This test the login module with incorrect input to access the system** | **This test the login module with incorrect input to access the system** | **Deny the user access to the system** | **The user was unable to log into the system. Error message incorrect username or password** | **Pass** |

1. **Apply Leave**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test ID** | **Function** | **Description** | **Expected Result** | **Actual Result** | **Status** |
| **Apply Leave** |  | **This test the Apply Leave process with correct input to request for leave** | **Allow the user to apply request** | **The request saved into leave history record with a message ‘request submitted successful** | **Pass** |
| **Apply Leave** |  | **This test the Apply Leave process with incorrect input to request for leave t** | **Prompt an error “please fill in the required spaces.** | **The request not saved into leave history record** | **Pass** |

1. **Add Users**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test ID** | **Function** | **Description** | **Expected Result** | **Actual Result** | **Status** |
| **Add Users** |  | **This test the Add user record with correct input** | **Allow the user to save into the record** | **The user saved into the record with a message ‘successful’** | **Pass** |
| **Add Users** |  | **This test the Add user record with incorrect input** | **Prompt an error “invalid record found.** | **The user was Prompt with an error “Invalid.** | **Pass** |

1. **View Staff**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test ID** | **Function** | **Description** | **Expected Result** | **Actual Result** | **Status** |
| **\*+View Staff** |  | **This test the View Staff record with correct input to search for a record** | **Retrieve record of the staff with that Id** | **The user retrieved record of the staff with the Id** | **Pass** |
| **View Staff** |  | **This test the View Staff module with incorrect input to search for a record** | **Retrieve an empty record.** | **The user retrieved an empty record.** | **Pass** |

**Integration Testing**

**1. Login and Account page**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test ID** | **Function** | **Description** | **Expected Result** | **Actual Result** | **Status** |
| **Login and Account Page** |  | **This test the login and account module with correct input to access the system** | **Allow the user to log into the account page in the system** | **The user logged into the account page in the system** | **Pass** |
| **Login and Account Page** |  | **This test the login and account module with incorrect input to access the system** | **The system will be stagnant** | **The system was stagnant** | **Pass** |

3. Apply Leave

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test ID** | **Function** | **Description** | **Expected Result** | **Actual Result** | **Status** |
| **Apply Leave** |  | **This test the Apply Leave process with correct input to request for leave** | **The information of the leave should be added to the leave history table** | **The request will be added** | **Pass** |
| **Apply Leave** |  | **This test the Apply Leave process with incorrect input to request for leave t** | **Nothing happens to the records in the leave history table** | **The leave history table did not chang** | **Pass** |

1. **Add Users and View Table**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Test ID** | **Function** | **Description** | **Expected Result** | **Actual Result** | **Status** |
| **Add Users and View Table** |  | **This test the Add user record with correct input** | **The record of the user will be stored with the username, user type and password** | **The record of the user will be updated and viewed in the user details table** | **Pass** |
| **Add Users and View Table** |  | **This test the Add user record with correct input** | **Nothing happens to the records in the user details table** | **The user details table did not change** | **Pass** |

**4.3 System Requirement:** the NSUBEB (EMS) Shows all the configuration that a system must have in order for a hardware and software system to run smoothly.

**4.4 System Evaluation:** The Niger State Universal Basic Education Board (NSUBEB) shows all measuring the final system against its initial performance goals as well as performing ongoing testing tom see that the system continues to meet the goals.

**4.5 Summary:** The chapter lays its focus on describing the implementation process of the proposed system, problems faced during implementation and how it was resolved by the developer. It also presented how the system was subjected to the various types of testing to ensure the usability, reliability, validity, quality and performance of the system which is very prominent before introducing the system on the main stream.