# CHAPTER 5: IMPLEMENTATION PHASE

## 5.1 Introduction

The design phase outlined the construction of the proposed system and gave a stepping stone into the into the implementation phase of the project. In the implantation phase the actual coding, testing, documentation and conversion of the project will take place. It is the last stage of the project development process.

## 5.2 Coding

Coding is the use of one or more programming or scripting languages to create software or hardware applications. For the development of this project the following languages and frameworks were used.

HTML

CSS

JavaScript

PHP

CodeIgnitor Framework

Jquery

Ajax

Bootstrap

CanvasJS

Morris.js

The actual code will be found in the appendix section of this project.

## 5.3 Testing

Testing is a crucia task that involves looking and searching for code defects commonly known as bugs witihin a system. The goal of testing is to reduce loss resulting from bugs of a system. The testing process are:

Executing the test condition

Checking output against result of the condition

Comparing expected results with test results

Document unexpected results

Repeat 1-4 until satisfied

Correct undesired results

Repeat 1-5 until satisfied

There are also different testing methods that can be employed and these include black box testing, white box testing and defect testing.

### 5.3.1 Black Box Testing

This is a software engineering testing technique that examines the functionality of software without getting into its code structure. The steps for black box testing are:

Examining the system objectives against the required functionality

Test inputs into the system

Compare the output against the desired output

Fix defects and retest

### 5.3.2 White Box Testing

This refers to testing the internal structure of the system.

box testing method and the testing does not normally follow a strict procedure but is rather ad-hoc. Acceptance tests run on the showed that both the clients and the staff at the hospital and registration office felt that the current system of doing things had to change and as such they were ready to receive the new system.

## 5.4 Installation

Define installation

### 5.4.1 Data Mitigation

Data Mitigation refers to …

The steps involved in installing the system are buying a domain name and uploading files to the web server. After successfully completing the steps and the domain name has propagated to point to the server the system will be accessible through a web browser.

### 5.4.2 User training

User training refers to instructing user on how they can use the system. Two training session were conducted at Gweru-Transport Operators Association. The first one was targeted at Transport operators and the second one at bus staff, that is drivers and conductors. A support link online was also set up to aid in helping system stakeholders.

### 5.4.3 Changeover Methods

Changeover methods are the strategies in which the organisation will change from the old system use to the new system. There are several methods that can be used for this process and each method has its own advantages and disadvantages. These strategies include direct changeover, parallel changeover, phased changeover and pilot changeover and the developer will explain all the strategies.

#### 5.4.3.1 Direct changeover

Direct changeover is when a newly developed system replaces the old system completely. It is most suitable when the old system has completely failed and must be done at a time that does not affect production such as a holiday or late night hours.

#### 5.4.3.2 Parallel Changeover

This changeover strategy is when both the old and new system operate simultaneously for a specific period of time until the new system is thought to be stable and can run the on its own. This allows comparing the best system between the two system, and gives a time to learn the new system. On the downside the parallel changeover is costlier and time consuming as it makes use of two systems.

#### 5.4.3.3 Phased Changeover

The phased changeover strategy is when a part of the system is implemented in the organisation. If a part of the system is proved to be working, the other parts are also implemented into the system. This allows for evaluation of how the system can affect the operations of the organisation, but implementing only a part of the system can give a false evaluation of the system.

#### 5.4.3.4 Pilot Changeover

This is a conversion strategy in which the whole system is implemented in one or a few selected branches or regions of an organisation. If the system proves to be working properly in one branch it will be implemented in all the other branches or regions. This method is cost effective and allows proper learning of a system. It gives time to evaluate results again.

#### 5.4.3.5 Recommendations

The pilot changeover method shall be implemented in installation of this project. The individual transport operators shall be considered to be the branches and three operators wil have the system first.

### 5.5 Maintenance

Maintenance is the continual process of checking up and correcting any malfunctions of a functioning item or product. Maintenance comes in four categories and these are preventive, perfective, predictive and corrective maintenance.

#### 5.5.1 Preventive maintenance

This maintenance strategy is performed to prevent problems before they happen. It is ideal for very sensitive systems and systems that carry sensitive data.

#### 5.5.2 Perfective Maintenance

Perfective maintenance is carried out to make sure a system is constantly meeting the objectives or the user requirements.

#### 5.5.3 Adaptive Maintenance

This is a maintenance strategy carried out when a new environment has to be set up. It is done in knowledge of a new environment.

#### 5.5.4 Corrective Maintenance

This refers to correcting errors that were made during the design and implementation of a system. It is ideal when there are known errors or bugs made during development.

#### 5.5.5 Recommendation

To ensure a perfect system running system, perfective maintenance strategy will be used in maintaining this system.

**5.6 Recommendations for future development**

Several proposals have been brought forward for use by the organization in previous chapters however, the summation of the recommendations that the developer proposed for the organizations are as follows:

Implementation of the system nationwide

Adoption of system by the RMT Department

At the time of compilation of this document the above were the noted recommendations but more recommendations are still welcome.

**5.7 Conclusion**

In conclusion, the implementation of the system outlined in this report was an overall success. The coding was done properly and testing revealed most of bugs which were fixed. Data mitigation was a smashing success. User training sessions were carried out and the user questions were responded to. Perfective maintenance will however need to be carried out continually.