**DEVELOPMENT OF A WEB BASEDAIRLINE RESERVATION SYSTEM**

**A Project Report**

***Submitted By***

Ojeh Julian Bekongfe

U14/NAS/CSC/074

***In partial fulfillment for the award of the degree of***

**(B.Sc) in Computer Science
Department of Computer Science**

 **GODFERY OKOYE UNIVERSITY**

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# CERTIFICATION

This is to certify that this project, titled Development Of a web based Airline Reservation System**,** which was carried out by Ojeh Julian Bekongfe with Registration Number U14/NAS/CSC/074, has met the requirements of the Department of Computer Science, Godfrey Okoye University.

…………………………………. …..…….………………….

**Ojeh Julian Bekongfe Date**

# DEDICATION

This work is dedicated to the Almighty God for his love, guidance and protection during and after this work. And to my lovely parents for their help and support to make this work a success. I am also dedicating this work to my friends, colleagues, well-wishers and fans who tirelessly motivated and gave me support throughout this work.

# APPROVAL PAGE

In partial fulfillment of the requirement for the award of Bachelors in Computer in the Department of Computer Science this project was presented by Ojeh Julian Bekongfe with Registration Number U14/NAS/CSC/074 has been approved by

…………………………. …. …………………………..

**Ms. Rosemary Ogugua, Date**

(Project Supervisor)

**………………………… …………………………..**

 **Dr. Mrs. Monica .N.Agu, Date**

(Head of Department)

# ACKNOWLEDGEMENTS

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 To my lecturers in computer science department. I am also using this medium to say a big thank you to my loving parentsfor their support towards my pursuit for academic excellence.

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**ABSTRACT**

This work is aimed at the development of a web based Airline Reservation System. The current system of airline reservation is faced with few technical issues, ranging from not allowing passengers to cancel their reservations as well as does not provide functionality for passengers to view price chart. This calls for the need to develop a new system that corrects this error. The new system will allow the passenger to cancel his/her reservation, if any problem occurs and view price chat which did not occur in the old system.This system will allow the airline passengers to search for flights that are available between the two travel cities, namely the “Departure city” and “Destination city” for a particular departure and arrival dates.

The objective of this study is to develop a web based system that will ensure enablement of online flight bookings, online access to passenger’s suggestions and complaints and a system that will enable online news publications for flight operators accessible to customers. The methodology adopted for this project is the Software Development Life Cycle (SDLC). The system is developed using PHP, MYSQL, JavaScript and Codeigniter. This current system will make passenger airline relationship with the customers more flexible and reliable. This work successfully designed a web based airline reservation system, solved the problem of passenger unavailability to cancel flight option and provides easy access to flight information.

**CHAPTER ONE**

**1.0** **INTRODUCTION**

Online Air Ticketing is a kind of user assistance where customers can book tickets for flight online. This is an easy method which saves a lot of time. Airline ReservationSystems were first introduced in the late 1950s as relativelysimple standalone systems to control flight inventory, maintain flight schedules, seat assignments and aircraft loading. The modern Airline Reservation System is comprehensive suite of products to provide a system that assists with a variety of airline management tasks and service customer needs from the time of initial reservation through completion of the flight [1]. One of the most common modes of travel is traveling by air. Customers who wish to travel by air nowadays have a wide variety of airlines, and a range of timings to choose from. Nowadays competition is so fierce between airlines that there are lot of discounts and a lot of luxuries given to customers that will give an edge to that particular airline [2].

The World Wide Web has become tremendously popular over the last four years, and currently most of the airlines have made provision for online reservation of their flights.The Internet has become a major resource for people looking for making reservations online without the hassle of meeting travel agents [3].

Reservation is the written record or promise of an arrangement by which accommodations are secured in advance [4]

Airline Reservation Systems (ARS) used to be standalone systems. Each airline had its ownsystem, disconnected from other airlines or ticket agents, and usable only by a designatednumber of airline employees. Travel agents in the 1970s pushed for access to the airlines'systems. Today, air travel information is linked, stored, and retrieved by a network ofComputer Reservations Systems (CRS), accessible by multiple airlines and travel agents. Theglobal distribution system (GDS) makes for an even larger web of airline information, notonly merging the buying and selling of tickets for multiple airlines, but also making thesystems accessible to consumers directly. GDS portals and gateways on the Web allowconsumers to purchase tickets directly, select seats, and even book hotels and cars rental [5].

**1.1** **STATEMENT OF PROBLEM**

The existing airline reservation system has the following shortcomings associated with it.

* Customers are not able to make cancellationsafter making reservation in an event where they are not able to travel again.
* The manual method of going to the airline desk to book flight is now obsolete and tasking.
* The airline sites are not open tocustomers suggestions and complaint.

**1.2** **OBJECTIVES OF THE STUDY**

The aim of the project is to Develop an Airline Reservation System.

The objective of this study is to develop a web based system that will ensure: -

i. Enablement of online flight bookings.

ii. Provision of an option that will enable a passenger(s) to cancel his/her flight due to whim or impulse.

iii. Online access to passenger’s suggestions and complaints.

iv. A system that will enable online news publications for flight operators accessible to customers.

**1.3** **SIGNIFICANCE OF THE STUDY**

This project is aimed at designing a new and better alternative system to help the organization to produce available operational reports when needed i.e reporting about the operational details that reflect day to day activities of the airline, safeguard data and information in the system database and keep accurate record on flight bookings and transactions.

**CHAPTER TWO**

 **LITERATURE REVIEW**

 **2.0 INTRODUCTION**

The system is developed using PHP, MYSQL, JavaScript and Codeigniter. The theoretical background covered the various technologies use in this system and the related work on this project.

**2.1 Theoretical Background**

The Technologies used in this work are listed below

1. Hypertext pre-processor (PHP)
2. JavaScript
3. MYSQL database

**PHP:** PHP is a scripting language, and a tool for making dynamic and interactive Web pages**.** It can be embedded into the HTML (hypertext mark-up language).

**<?php**

Include "includes/dbconnect.php"; Include "includes/functions.php"; $name = (!empty($\_REQUEST["name"]))?strip\_tags(str\_replace("'","`",$\_REQUEST["name"])):''; $phone = (!empty($\_REQUEST["phone"]))?strip\_tags(str\_replace("'","`",$\_REQUEST["phone"])):''; $email = (!empty($\_REQUEST["email"]))?strip\_tags(str\_replace("'","`",$\_REQUEST["email"])):''; $comments = (!empty($\_REQUEST["comments"]))?strip\_tags(str\_replace("'","`",$\_REQUEST["comments"])):'';

$date = (!empty($\_REQUEST["date"]))?strip\_tags(str\_replace("'","`",$\_REQUEST["date"])):''; $bookingTexts = getBookingText($serviceID); include "includes/javascript.validation.php"; if(!empty($msg2) && $msg2=="captcha"){ $msg = "<div class='error\_msg'>Captcha error! Please try again</div>"; }

?>

**JAVASCRIPT:**

JavaScript is a client-side script, used to control a web page at the client side once it has downloaded. It is used to make webpages interactive. It supports event-driven, functional, and imperative programming style.

In order to achieve a dynamic web development, **Dynamic Hyper Text Markup Language** (**DHTML**) was used for client-side scripting and (**PHP**) for the server-side scripting. A **DHTML** contains tags such as <head><body><tr>, while **PHP** contains tags such as <PHP? <echoe etc. Which tell the browser about the format of the web page. A **DHTML** file has an **.html** filename extension, so as PHP has a **.php** filename extension. PHP and DHTML tags can be created on a text editor such as “Notepad”.

*<!DOCTYPE html>*

*<html lang="en">*

*<head>*

*<title></title>*

Both DHTML and PHP can be employed in the creation of a dynamic web page and that gives it a unique feature.

Also a server technology APACHE was effectively utilized to hold the database and communicate with the web page effectively. The latest version of apache as built by Wamp Server Technology was used and Structured Query Language (SQL) was used for the databases.

**2.2 Review of Relevant Literature**

The history of airline reservations systems began in the late 1950s when American Airlines required a system that would allow real-time access to flight details in all of its offices, and the integration and automation of its booking and ticketing processes. As a result, Sabre (Semi-Automated Business Research Environment) was developed and launched in 1964. Sabre's breakthrough was its ability to keep inventory correct in real time, accessible to agents around the world. Prior to this, manual systems required centralized reservation centres, groups of people in a room with the physical cards that represented inventory, in this case, seats on airplanes.

The deregulation of the airline industry, in the Airline Deregulation Act, meant that airlines, which had previously operated under government-set fares ensuring airlines at least broke even, now needed to improve efficiency to compete in a free market. In this deregulated environment the ARS and its descendants became vital to the travel industry. In the early days of American commercial aviation, passengers were relatively few, and each airline's routes and fares were tightly regulated by the Civil Aeronautics Board. These were published in a volume entitled The Official Airline Guide, from which travel agents or consumers could construct an itinerary, then call or telex airline staff, which would mark the reservation on a card and file it. As demand for air travel increased and schedules grew more complex, this process became impractical. This system was used in the hospitality branch[6].

In 1946, American Airlines installed the first automated booking system, the experimental electromechanical Reservisor. A newer machine with temporary storage based on a magnetic drum, the Magnetronic Reservoir, soon followed. This system proved successful, and was soon being used by several airlines, as well as Sheraton Hotels and Goodyear for inventory control[7]. It was seriously hampered by the need for local human operators to do the actual lookups; ticketing agentswould have to call a booking office, whose operators would direct a small team operating the Reservoir and then read the results over the telephone. There was no way for agents to directly query the system.

In 1953, Trans-Canada Airlines (TCA) started investigating a computer-based system with remote terminals, testing one design on the University of Toronto's Manchester Mark 1 machine that summer. Though successful, the researchers found that input and output was a major problem. Ferranti Canada became involved in the project and suggested a new system using punched cards and a transistorized computer in place of the unreliable tube-based Mark I. The resulting system, ReserVec, started operation in 1962, and took over all booking operations in January 1963. Terminals were placed in all of TCA's ticketing offices, allowing all queries and bookings to complete in about one second with no remote operators needed.

In 1953, American Airlines CEO C. R. Smith chanced to sit next to R. Blair Smith, a senior IBM sales representative, on a flight from Los Angeles to New York. C.R. invited Blair to visit their Reservoir system and look for ways that IBM could improve the system. Blair alerted Thomas Watson Jr. that American was interested in a major collaboration, and a series of low-level studies started. Their idea of an automated Airline Reservation System (ARS) resulted in a 1959 venture known as the Semi-Automatic Business Research Environment (SABRE), launched the following year[8]. By the time the network was completed in December 1964, it was the largest civil data processing system in the world.

Other airlines soon established their own systems. Delta Air Lines launched the Delta Automated Travel Account System (DATAS) in 1968. United Airlines and Trans World Airlines followed in 1971 with the Apollo Reservation System and Programmed Airline Reservation System (PARS), respectively. Soon, travel agents began pushing for a system that could automate their side of the process by accessing the variousARS directly to make reservations. Fearful this would place too much power in the hands of agents, American Airlines executive Robert Crandall proposed creating an industry-wide Computer Reservation System to be a central clearinghouse for U.S. travel; other airlines demurred, citing fear of antitrust prosecution[10].

An Airline Reservation System is part of the so-called Passenger Service Systems (PSS), which are applications supporting the direct contact with the passenger.

The Airline Reservations System (ARS) was one of the earliest changes to improve efficiency. ARS eventually evolved into the Computer Reservations System (CRS). A Computer Reservation System is used for the reservations of a particular airline and interfaces with a Global Distribution System (GDS) which supports travel agencies and other distribution channels in making reservations for most major airlines in a single system[11].

**2.3 Summary**

This Airline Reservation Systems was achieved by codeigniter tool and PHP and MYSQL. The system will increase awareness among frequent travelers about various special offers and discounts as well asminimize the number of vacant seats on a flight and maximize flight capacity utilization.

 **CHAPTER THREE**

 **SYSTEM ANALYSIS AND DESIGN**

**3.0 Introduction**

Methodology involves a process whereby the existing or current system is studiedto identify the information requirements. It is used to refer to a specific series of steps or procedures which governs the analysis and design of a particular project. It also includes the techniques and methods which are used to collect and analyzeinformation. To achieve all these stated above, the Software Development Life Cycle (SDLC) methodology was used. The SDLC methodology is a process that produces software with the highest quality and lowest cost in the shortest time. SDLC includes a detailed plan for how to develop, alter, maintain and replace a software system. Software Development Life Cycle involves several distinct stages including planning, design, building, testing and deployment.

SDLC works by lowering cost of the software development while simultaneously improving quality and shortening production time. SDLC achieves these apparently divergent goals by following plan that removes the typical pitfalls to software development projects. That plan starts by evaluating existing systems for deficiencies. Next, it defines the requirements of the new system. It then creates the software through the stages of planning, design, building, testing and deployment. By anticipating costly mistakes like failing to ask the end user for suggestions. An example of SDLC is Big Bang model. This model throws more resources at development and works best for small projects. It lacks the thorough requirement definition of other methods.

****FIG 3.0: SDLC Methodology stages.

* 1. **DESCRIPTION OF THE EXISTING SYSTEM**

The existing system of Airline Reservation System (ARS) is a software application that assist an airline with transactions related to making ticket reservations, which includes blocking, reserving and rescheduling tickets. Minimize repetitive work done by the system administrator and reservation clerks. Maintain consistency among different access modes, e.g. by phone, by web, at the information desk and across different physical locations. The users should be basically taken through the same steps by the system as they go through in conventional desk-reservation systems.

**3.2ANALYSIS OF THE PROPOSED SYSTEM**

Due to advancement in Technology the new system is mobile responsive and customers can book airline reservation at their own pace, customers can view various flight information and can also reschedule their flight trip after booking. also, the new system maintains customer information in case of emergency, e.g. flight cancellation due to inclement weather. The profile can also be used by the airline company to track user preferences and travel patterns to serve them better, plan routes, for better marketing and efficient scheduling of flights.

The new systems help to maximize the revenue of the airline company by various means:

* Increase awareness among frequent travelers about various special offers and discounts.
* Minimize the number of vacant seats on a flight and maximize flight capacity utilization.
* Maintain the capability to adopt a flexible pricing policy. The price of the tickets should be dynamically determined based on how early, before the date of departure, the customer buys the ticket.

**3.3 System Architecture**

**3.3.1 Database Design (MYSQL)**

In this section, the basic structure of the tables composing the database for the project are shown along with information about primary and foreign keys.MySQL Database Server:MySQL is a popular choice of database for use in web applications and is a central component of the widely used LAMP open source web application software stack—LAMP is an acronym for "Linux, Apache, MySQL, Perl/PHP/Python/JSP". The MySQL Database powers the most demanding Web, E-commerce and Online Transaction Processing (OLTP) applications. It is a fully integrated transaction-safe, ACID compliant database with full commit, rollback, crash recovery and row level locking capabilities. MySQL delivers the ease of use, scalability, and performance that has made MySQL the world's most popular open source database

**User**

**S/NO NAME DATA TYPE DESCRIPTION\_\_**

1 UserID Varchar Primary key for Customer identification

2 Password Varchar Security for Customer

3 First\_Name Varchar

4 Last\_Name Varchar

5 Address Varchar

6 City Varchar

7 State Varchar

8 Email Address Varchar

9 Phone\_Number Integer

**TABLE 3.3.1: User Table**

**Customer Table**





**TABLE 3.3.2: Customer Table**

**3.3.2 System Architecture (Case Diagram)**



**FIG 3.3.2: Case Diagram showing the system architecture.**

 **CHAPTER FOUR**

 **SYSTEM IMPLEMENTATION**

**4.0 INTRODUCTION**

System implementation is a collection of inter-dependent physical devices together with their programming which provides the functionality and performance for which the system was designed. It covers all the activities necessary to set the system that has been analyzed and designed to be fully functional to the users.

**4.1 Choice of Development Environment**

The development tools are the necessary requirement tools used during the design to enable us achieve the system design. The listed packages were used because of their features, accessibility and also because it is more effectivity.

1. MySQL database application

2. PHP scripting Language

3. HTML language and JavaScript

4. Notepad plus

5. CodeIgniter

**MySQL Database Server:** MySQL is a popular choice of database for use in web applications, and is a central component of the widely used LAMP open source web application software stack—LAMP is an acronym for "Linux, Apache, MySQL, Perl/PHP/Python/JSP". The MySQL Database powers the most demanding Web, E-commerce and Online Transaction Processing (OLTP) applications. It is a fully integrated transaction-safe, ACID compliant database with full commit, rollback, crash recovery and row level locking capabilities. MySQL delivers the ease of use, scalability, and performance that has made MySQL the world's most popular open source database.

**PHP:** PHP is a server-side scripting language that allows your Web site to be truly dynamic. PHP stands for PHP: Hypertext Preprocessor Its flexibility and relatively small learning curve (especially for programmers who have a background in C, Java, or Perl) makes it one of the most popular scripting languages around. PHP’s popularity continues to increase as businesses, and individuals everywhere embrace it as an alternative to Microsoft’s ASP language and realize that PHP’s benefits most certainly outweigh the costs.

**HTML Language:**

Hypertext Mark-up Language (HTML), the standard text-formatting language for documents on the interconnected computing network known as the World Wide Web. HTML documents are text files that contain two parts: content that is meant to be rendered on a computer screen; and mark-upontags, encoded information that directs the text format on the screen and is generally hidden from the user.

**JavaScript** is a programming language that adds interactivity to your website for example: games, responses when buttons are pressed or data entered in forms, dynamic styling, animation etc.

**4.2 IMPLEMENTATION ARCHITECTURE**

**4.2.1 Block diagram**

Functional Decomposition Diagram

A decomposition diagram shows a top-down functional decomposition of a system and exposes the system's structure. The objective of the Functional Decomposition is to break down a system step by step, beginning with the main function of a system and continuing with the interim levels down to the level of elementary functions. The diagram is the starting point for more detailed process diagrams, such as data flow diagrams (DFD).



FIG 4.2.1: Airline Reservation System Data Flow Diagram

**4.2.2 Program Design**

Having considered the old system, the structure of the new system was being prepared on paper. This involves a segmental designing method applied to the structure for the new system.



**FIG 4.2.2: Program Design**

**4.2.3 PROGRAM FLOW CHART**

During the Design of an OnlineAirline Reservation System, a modular designing approach was used to design the program for the system. The designof the new system was carefully developed into paper considering the old system. Flowchart was used as an effective graphical representation of the program, as well as a design tool and it is aided in the evaluation of a logical correct program[13].



**FIG 4.2.3: PROGRAM FLOWCHART**



**Fig 4.2.4 File Maintenance**

4.3 SOFTWARE TESTING

Testing is the last stage in the software development and it presents an interesting anomaly for the software engineer where he attempts to build software from an abstract concept to a tangible product. During testing, the engineer creates series of test cases to discard preconceived notions of the “correctness” of software just developed and overcome a conflict of interest that occurs when errors are uncovered. As a secondary benefit, testing demonstrates that the software functions appear to be working according to specification, that behavioral and performance requirements appear to have been met. In addition, data collected as testing is conducted provide a good indication of software reliability and quality as a whole.

Testing the software follows a certain process as shown below:

****

**Fig 4.3 System Testing Process**

**Unit Test**

Each unit of the new system was tested (test run) individually alongside with the old system in other to identify areas of further enhancement and development.

**System Test**

The entire system was as well tested (test run) in general alongside with the old system in other to identify areas of further enhancement and development.

**4.4 Documentation**

In order for the proposed system to be used on any computer system it takes the following:

1. Boot the system.
2. Login in to the ISP account
3. Click on the file manager on the control panel.
4. Click on directory and processed to click on upload
5. Upload your web files into the directory
6. Open any browser on your system (Microsoft internet Explorer, Mozilla Firefox,Netscape Navigator, Opera, Flock, Safari etc.)
7. Type https://www.airlinebooking.com.ng on the address bar and press the return key or enter key.
8. Then the website will come up

**4.4.1 User Manual**

The steps to use the proposed system are as follows:

i. On the address bar of any browser type https://www.airlinebooking.com.ng

ii. After selecting and adding to the cart flight schedule at checkout you will be prompted to supply username and password this verifies that you are a registered user if not the customer will be prompt to register

iii. If the username and password supplied are correct as that of a user you are prompted with the user dashboard page with the list of available task /action which you can do or based on choice.

iv. The username and password are in three formats as an administrator, as a Vendor and as well as a user/customer.

V. As a Vendor you are to type https://www.airlinebooking.com.ng/ vendor.php on the address bar.

vi. As a vendor you are prompted with the vendor page where the vendor can manager his/her customers and their bookings.

vii. As an administrator you are to type https:/www.airlinebooking.com.ng/ admin.php on the address bar.

viii. As an administrator you are prompted with the administrator page that is the back end of the system.

**4.4.2 Source Code**

**<?php**

Include "includes/dbconnect.php"; Include "includes/functions.php"; $name = (!empty($\_REQUEST["name"]))?strip\_tags(str\_replace("'","`",$\_REQUEST["name"])):''; $phone = (!empty($\_REQUEST["phone"]))?strip\_tags(str\_replace("'","`",$\_REQUEST["phone"])):''; $email = (!empty($\_REQUEST["email"]))?strip\_tags(str\_replace("'","`",$\_REQUEST["email"])):''; $comments = (!empty($\_REQUEST["comments"]))?strip\_tags(str\_replace("'","`",$\_REQUEST["comments"])):'';

$date = (!empty($\_REQUEST["date"]))?strip\_tags(str\_replace("'","`",$\_REQUEST["date"])):''; $bookingTexts = getBookingText($serviceID); include "includes/javascript.validation.php"; if(!empty($msg2) && $msg2=="captcha"){ $msg = "<div class='error\_msg'>Captcha error! Please try again</div>"; }

?>

**Booking Form source code**

<div class="internal\_booking\_form">

<form name="ff1" enctype="multipart/form-data" method="post" action="booking.processing.php" onsubmit="return checkForm();">

<input type="hidden" value="<?php echo $date?>" name="date"><input type="hidden" name="interval" value="<?php echo $int;?>" /><input type="hidden" name="serviceID" value="<?php echo $serviceID;?>" /><?=getFullMonth(date("n", strtotime($date)))." ".date("d", strtotime($date)).", ".date("Y", strtotime($date))?> Availability</h2

<p class="desireTime">Please select desired time. <?php echo $bookingTexts[0]?>

<?php echo $bookingTexts[1]?></p>

<?php echo $availability?>

<?php $num1 = rand(1,9); $num2 = rand(1,9); $sum = $num1 + $num2; ?>

PREPARE BOOKING DATE/TIME #

CREATE ORDER $q="INSERT INTO bs\_reservations (dateCreated, name,

$res=mysql\_query($q) or die("error! 002"); //needed for message $tempVar .= "<tr>

<td>".date("d",strtotime($date)).getFullMonth(date('n',strtotime($date))).date("Y"strtotime($date))."</td><td>".date((getTimeMode())?"g:ia":"H:i", strtotime($dateFrom))."</td>

<td>".date((getTimeMode())?"g:ia":"H:i" href=\"http://".$\_SERVER['SERVER\_NAME'].$baseDir."manageReservation.php?email=".urlencode($email)."&uid=".$uid."\">link</a>";

**CHAPTER FIVE**

**SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**.

**5.1 Summary of Result**

A new system of Airline Reservation System has been developed in this project work. The exercise was carried out based on the loopholes existing in the management of air Transport Service. Number of problems encountered in the existing service process thereby creating opportunity for

1. Reliability in the management of customer’s document.

2. Fast discharge of auditing responsibilities.

3. Accuracy of computations.

4. Provision of easy adjustment and update of customer records.

5Customers are able to make cancellations after making reservation in an event were they are not able to travel again.

**5.2 CONCLUSION**

Airline Reservation System (ARS) has led to ease of airline ticketing, flight scheduling and also provided a means for customers to access and book flights from their homes. It has also increased the speed with which information about customers are retrieved and handled and flight scheduling is tasked. Owing to the ease and comfort of Airline Reservation system and the advancement in mobile Technology local flights which are not on the system should be encouraged to compensate the system. Secondly, the system should be made available so as to encourage consumers and travel agents on patronizing the system

**5.3 RECOMMENDATION**

For this research work, I recommend a parallel change over, parallel change over means a situation where by the old and the new systems run simultaneously for a given period of time. This tends to be the most popular changeover techniques mainly because it carries the lowest risk because if something goes wrong at any point, the entire system can be reverted back to its original state. There are other tasks that must be accomplished foreffectiveness of this changeover;

They include the following.

1. Installation of cooling devices such as the air condition for cooling the computer system

2. The company should be sending their staff for training so that they acquire more skills and experience in operating the new designed system

3. Provision of security measures for the system e.g. Alarm gadgets and burglary proof should be in place.

4. Installation of telephone services is needed so that there won‟t be any problem in communication.

5. Provision of false floor and false ceiling.

6. Provision of house cleaner to keep the computer room neat and dust free.

#

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**FIG 5.0**