**CHAPTER ONE**

**INTRODUCTION**

**1.1 Background of the Study**

The rapid spread of the internet is well known, with its size and power making it today’s dominant software development platform. Present technology has gone beyond client-server applications, and new forms of software products are transforming people’s individual work, organizations, and society and Nigeria is not exempted from this technological change.

Nigeria is a growing tourist destination, there has been a good rise in the number of hotels and resorts in Nigeria and the tourist sector is broadening, thus the rapid development and commercialization of Information and Communication Technologies (ICTs) for the travel and tourism industry has prompted hotels and other enterprises in this sector to increasingly adopt these technologies. The ICT based products and processes help the hotels to enhance their operating efficiencies, improve the service experience as well as provide a means to access markets on a global basis. The current increase in tourism and rise of foreign investors around the world has made a need for online hotel reservation to come to play as tourists can book a hotel room online even from the airport. The hotel industry has the function of providing hospitality services to customers. These customers can be travelers, foreigners, businessmen, tourists, visitors, etc.

The goal of every hotel is to sell more rooms and make profit, yet without an online reservation system they are forced to remain local while rely on phone calls and walk-ins only to make reservation. An online reservation system is now a necessity for hotels as it creates a system that can extend and compete globally, allowing guests to make reservations by selecting preferred room, scheduling dates and length of stay and make payment all in on one platform and at the same time. Online Hotel Reservation System is efficient, yet it is easy and uncomplicated to use. Online hotel reservation provides a hassle-free management of bookings as the reservation system is computerized as it works all the time, affording potential visitors book available rooms anytime and anywhere. It enables one to check available inventory (as it provides an instant ‘picture’ of which rooms are available for reservation) and complete an online reservation with the whole process being less time consuming. It reduces the dependability on Online Travel Agency (OTA) and other travel agents as clients are available to 24x7 reservations and get queries resolved quickly by directly communicating with hotels rather than waiting to get confirmation for their bookings. This would increase the efficiency of staffs as they will not be tied to a phone waiting for guest calls and also reduce cost as it will eliminate email exchanges between guests and reservation personnel. Online reservation reduces workload for staff and optimizes customer service.

However, having an online reservation system is one thing, but having an effective online reservation system is another, and this is the need for a cloud based hotel reservation system. Cloud computing is the on-demand availability of [computer](https://en.wikipedia.org/wiki/Computer) [system resources](https://en.wikipedia.org/wiki/System_resource), especially [data storage](https://en.wikipedia.org/wiki/Data_storage) and [computing power](https://en.wikipedia.org/wiki/Computing_power), without direct active management by the user. Cloud technology is a highly scalable and flexible infrastructure for developers to build, test and deploy apps. Microsoft defined cloud computing as “the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet (“the cloud”) to offer faster innovation, flexible resources, and economies of scale”.

Cloud is a significant technological development that is being rapidly adopted in this technological age. It is reliable as it provides high uptime and availability, as the system would be virtually using the resources of multiple servers such that if one server goes offline, the system is automatically transferred to another server with zero downtime. Cloud computing also makes data backups and disaster recovery easier as data is mirrored at multiple redundant sites on the cloud provider’s network.

Cloud computing eliminates the capital expense of buying hardware and software and setting on-site datacenters i.e. racks of servers thus providing greater return on investment as you pay only for the resources that are used by the system. It also has the ability to scale server resources on demand and hence the system would never go offline unlike deploying the system to a physical server in which when it has technical issues, the system would automatically go down. The cloud also affords vast amount of computing resources such as speed and performance as it accommodates easier load balancing between multiple server environments, thereby putting less strain on a single server’s resources. Also, providers of cloud services regularly upgrade their resources to be very efficient thus reducing network latency.

The cloud providers offer broad set of policies and technologies and control that strengthen the security of the system thus protecting the data and infrastructure from potential threats. This means since the system would have an integrated payment system, the user’s debit card details and other sensitive information of the user is secured from intruders.

**1.2 Problem Statement**

The current system is manual, slow and time consuming and it is very difficult for customers to book through an agent as they would have to await a confirmation for their reservation. As pointed by Polo (2013), “Guests will have to wait for confirmation within 24 hours after their booking”. Some other problems that may occur are: a customer getting to a hotel and discovers that there are no rooms available for reservation hence they are constrained in trying to get a room to pass the night; as the usual practice is to look for a hotel when you have arrived in a particular location, walk in and find out whether there is a vacant room. In the case that there is no vacant room, a customer has to move to the next closest hotel (which could be long distance apart) to make the same enquiry once more. As explained by Gabriel “Visitors might have to move around sometimes very late in the night in search of a hotel, exposing themselves to potential threats that might be lurking around only to discover that fully the rooms as also fully booked or perhaps the available room does not suit the taste of the customer

A guest checking into a hotel room that is either too expensive or too unbefitting for his/her personality; customers having little or no information about the hotels within their vicinity; prolonged delay by the receptionist in retrieving certain information about any particular guest that checked into the hotel whenever such information is demanded; the foul play that sometimes occurs when information about the guest that checked into a hotel are not officially documented by the receptionist etc. Attendants are quick to serve those who walk in rather than those who may get access to them on phone to book a room hence there is a tendency for your reservation not to be entered. Also, return on investment would be reduced as online travel agents would have a share in the price to be paid in by customers, this would reduce the hotel’s income.

**1.3 Aim and Objectives**

The aim of this study is to automate the process of hotel reservation with minimal downtime.

This would be achieved by the following objectives:

* To design a highly scalable online hotel reservation system, with secured features, high uptime, scalability and availability, improved performance and decrease in load times.
* To implement the system using the waterfall model which would curb the manual method of hotel reservation giving room to 24/7 hotel reservation thus yielding better revenue.

**1.4 Scope and Limitation of the Study**

The study covers the development of a cloud based online hotel reservation system which would facilitate online reservation; online display of the picture of the available rooms and other room features to give customers a view of the whole room from every angle alongside the room descriptions, room features to enable customers have a glance of the rooms to be reserved to meet their taste alongside the room prices, keep customers’ reservation records, room management, manage room reservations, add administrative users, secured payment system using an Application Programming Interface (API), automatically generate and send a mail to customer’s provided email containing reservation details, check-in and check-out system for customers using an automatically generated ID: a combination of alphabets and the current timestamp of every reservation. However it is limited as the system would not support rescheduling of reservation as payment is made alongside reservation.

**CHAPTER TWO**

**LITERATURE REVIEW**

Over the years, the need for an online hotel reservation has been on the increase most especially I in this technological age. The Hotel Industry like any other business opens up socio-economic opportunities for both owner and customer. It has the function of providing hospitality services to customers (Richard *et al*, 2014).

The vast growth of the tourism and technological growth has led to the rapid increase in hotel industries. But hotels which desire to remain in business and grow its populace and revenue must make their offers and services readily available to potential customers by providing such services on a global scale (internet). Gates (2019) stated that “any business that is not online would soon be out of business”. This would make their services available anytime, anywhere and thus affording potential online customers to search and make reservations right from where they are.

Online hotel reservations are becoming a very popular method for reserving hotel rooms. Travelers can make room reservations from home by using an online security to protect their privacy and financial information and by using several online travel agents to compare prices and facilities at different hotels (Glenda and Mischelle, 2013).

The need for a stable and secured online resource is of great importance hence the need for implementing a system on the cloud. Many organizations want to move their existing legacy application to the cloud environment because they are facing some problems in adopting new technologies, platforms, and standards. (Shrikant, 2014)

Rocha and Vazquez (2014) depicts that “there are several benefits that brings cloud implementation and several competitive opportunities for organizations that use them”. Some of these benefits include cost, competitiveness, availability, scalability etc.

Cloud migration can reduce both capital expense and operating expense costs because resources are only acquired when needed and are only paid for when used. In cloud computing environment resources are managed by third party, so they are responsible for resource maintenance and upgrade (Shrikant, 2014).

**CHAPTER THREE**

**RESEARCH METHODOLOGY**

**3.1 System Design**

Research methodology is a systematic programming approach of a well-defined procedure that should be followed in carrying out a thorough research work. It is a system of methods that is used to plan, structure and control the process of developing an information system. The current system was analyzed to bring to light its weaknesses and to obtain adequate requirements on how the system should operate. The current manual system need to be made more efficient by developing an online resource for its activities as this would improve organization’s efficiency and produce a high return on investment.

Waterfall Model would be implored as it involves breaking down the requirements/problems, analyzing the system, creating functional code or solution, testing, implementing and software operation and maintenance.



**Figure 1: Waterfall Model**

**3.1.1 Stages of Waterfall Model**

**Requirement Gathering**

Here discussion with various stakeholders was made concerning the development of the software to bring out as much requirements as possible. Requirements (user, system and functional) were obtained from the following sources:

1. **Primary Source:** the primary source of information used in the course of this research was basically collected by interview and observation.
2. **Secondary Source:** Here, data was obtained from published materials such as journals etc. and the internet.

**System Analysis**

In system analysis, the current system related problems were studied and examined to bring out the necessary requirements for the software to be developed.

**Coding**

This step involves writing the program code to develop an error-free executable program efficiently. It is also known as the programming phase. This project therefore employs the following technologies:

* **Frontend:** The front, end also known as the client side, of a website is the part that users interact with. It comprises of everything that a user sees when navigating around the Internet, from fonts and colors to dropdown menus and sliders. It is a combination of HTML, CSS, and JavaScript being controlled by your computer’s browser.

The frontend of the system was built using Hypertext Markup Language, HTML and styled using Cascading Style Sheet, CSS. The frontend is run on a framework, Bootstrap to promote software responsiveness. Interactivity on the website was added using JavaScript.

* **Backend:** The back end, also known as the server side, of a website consists of a server, an application, and a database. Hypertext Pre-processor PHP, a server side programming language is the technology used to develop the server side.

PHP is a server side programming language therefore it must run on a server. PHP was run locally on the XAMPP server which is an apparent acronym for (Apache, MariaDB, PHP, Perl).

**Database**: Database is a collection of related data and data is a collection of facts and figures that can be processed to produce information. MySQL, a relational database was used to store customers’ record and information locally. SQL is a programming language for relational databases. SQL comprises both data definition and data manipulation languages. Using the data definition properties of SQL, one can design and modify database schema, whereas data manipulation properties allows SQL to store and retrieve data from database. SQL commands are used to perform both data definition and data manipulation languages such as, CRUD (Create, Read, Update and Delete) etc. XAMPP which comes with a number of modules including phpMyAdmin, was used to design the schema for the database.

* **Cloud Platform:** Google Cloud Private cloud architecture is the technology on which the software was featured.
* **Paystack:** This is a payment gateway that would process the hotel reservation payment. Its payment API would be integrated into the system to enhance secured payment.

**Testing**

Testing was conducted while coding and at the users’ end. This facilitated discovery of errors and thus its quick remedy to as to develop a reliable reservation system.

**Implementation**

The system was deployed as Software as a Service (SaaS) using the lift and shift migration.

**Operation and Maintenance**

The system operates on Google Cloud technologies.

**CHAPTER FOUR**

**DISCUSSION OF RESULTS**

**References**

Glenda, A. D. & Mischelle, A. E. (2013). Online Hotel Reservation and Management System for the College of International Tourism and Hospitality Management. *International Journal of Computers & Technology*, *10*(1), 1202

Richard B., Akwasi A. & Emmanuel D. (2014). Online Hotel Reservation System. *IJISET - International Journal of Innovative Science, Engineering & Technology,* *1*(9), 1

Rocha, L. & Vazquez, A. (2014). Benefits of Adoption of Cloud Computing in Mexico *ECORFAN Journal, 5*(12), 2046

Shrikant, D. B. (2014). Cloud Migration Benefits and Its Challenges Issue.*IOSR Journal of Computer Engineering*

Marco Polo (2013). Online Hotel Reservation (OHRS).

Put in the chapter one that cloud is a cluster of linux servers accessed through the internet.

All these problems and more would definitely make a hotel experience a down time in business. But imploring an online hotel reservation system, the above mentioned problems are curbed, better user performance and availability of the system at all times is guaranteed (Richard, Akwasi & Emmanuel, 2014).