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Online computerized Hotel Management System

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ABSTRACT

The purpose of this research, computerized hotel management system with Satellite Motel Ilorin, Nigeria as the case study is to understand and make use of the computer to solve some of the problems which are usually encountered during manual operations of the hotel management. Finding an accommodation or a hotel after having reached a particular destination is quite time consuming as well as expensive. Here comes the importance of online hotel booking facility. Online hotel booking is one of the latest techniques in the arena of internet that allows travelers to book a hotel located anywhere in the world and that too according to your tastes and preferences. In other words, online hotel booking is one of the awesome facilities of the internet. Booking a hotel online is not only fast as well as convenient but also very cheap. Nowadays, many of the hotel providers have their sites on the web, which in turn allows the users to visit these sites and view the facilities and amenities offered by each of them. So, the proposed computerized of an online hotel management system is set to find a more convenient, well organized, faster, reliable and accurate means of processing the current manual system of the hotel for both near and far customer.

Keywords: Hotel, reservation system, Internet, Online booking

INTRODUCTION

Hotel Management System operates a global online hotel reservation system for business and leisure travelers. To compete with the international e-marketplace, a great deal of attention should pay towards the optimization of user requirements to generate recommended hotel alternatives [1]. In general sense, hotel management is the way of maintaining different activities of a hotel where a number of staffs are engaged to perform a number of these activities. At first let us take a glance to an ordinary hotel. For hiring a room in this type of hotel, the client needs to meet with the receptionist to collect the information of hotel facilities [2]. After that he is to fill up the pro forma provided by the hotel authority, then he has to pay the defined amount of money and is offered room key for his/her rented room. He/she is then finishes the formalities a reception zone through these undergoing customs. But client always wants greater privacy and reliable security. Koolmanojwong et al. [3] developed an intelligent e-marketplace for the tourism based on fuzzy to serve the customers who wants to travel but has no idea about the accommodation [4]. This system is global in the sense that anyone can use this to find the appropriate hotel according to his/her affordable means [5]. The details of the hotel management systems including the franchising, casinos, health Spas, payroll, credit, accounting control etc. are well described in [6].

Review of Related Works

Managing hotel service is very complex, hence it involves job of dealing with customers directly, purchases made by customers and room reservation. The manual hotel management is subdivided into section with each section having specific tasks. These tasks will however from time to time interact operationally to achieve organizational objectives. The mode of interaction consists of all characteristics of a typical manual system i.e. communication through verbal means, documents etc. This now leads to computerization of hotel management [9]. The proposed intelligent hotel management (IHM) system is free from a significant number of hotel staffs that provides those facilities and fewer formalities. In mal-populated countries dearth of manpower is increasing gradually. Therefore, they have to import manpower from other countries. In this condition the IHM can be a permanent solution. Moreover, it possesses adequate security [7]. This system provides hi-tech room facilities including auto controlled door, automatic light controlling, voice active devices etc. Apart from these, it prevents the waste of electric power as well as excessive water that are the main ideas used in this paper. A short version of this approach is in [8].

Additionally, we have integrated a new image processing approach which accurately ensures the presence and darkness of the room to be occupied. The co-ordination of these activities is quite cumbersome. For instance, the receptionist has a lot of enquiries to make, and as such, a lot of paper works to do. Some facts may exist in several documents in many forms, so that information retrieved is dependent on the document referred to, some details of the receptionists transactions with customers have to be forwarded to other directions, for example, details of the number of days of reservation booked by a customer has to be forwarded to account section for billing. The dinning section also keeps the record of customers expenditures and communicate them to the account section, for billing also for example during the lodging of the customer, all his expenses are recorded so that at the same time of exit, the document will be forwarded to the account section for processing. The dinning section also interacts with purchasing section by notifying them of their stock needs etc. The purchase section is responsible for the general stock control activities. They purchase all the goods needed by the hotel and they rely mostly on the information from other sections to determine facts. With all these, there is need for hotel management needs to be computerized [9].

However, we have designed an HMS system which is specific to a particular hotel, Satellite Motel Ilorin, Nigeria. It helps the owner to serve the intended customers without directly involving with them. This system has included the electronic circuitry embedded with several sensors in integrated with the java programming [9]. The design of travel and tourism websites has received substantial attention by scholars (e.g. Schegg *et al.*, 2002; Law and Leung, 2002; Law and 3 Wong, 2003; Landvogt, 2004; So and Morrison, 2004. Landvogt (2004) evaluates several online booking engines over 23 different criteria, like overall user friendliness, payment method, instant confirmation, reliability, and invoicing function among others. Some of these criteria were considered system's functions and design principles in this paper.

Method of booking

With the computerization of Satellite Motel Ilorin, Nigeria, customers can now book reservation by telephone, letter or by direct contact with the hotel. When a customer decides to call personally and book, the reception will inquire the type of room sort. There are three main types of rooms:

i. Twin Room(Double Suit)
ii. Luxury Suit
iii. Exclusive Suit

The receptionist presents the customer with a document known as the tariff. This stipulates the type of rooms that are available and their respective costs. It also consists of other information such as the cost per type of meal that is breakfast, lunch and dinner. When the customer has decided on the room desired he then collects and fills the guest registration card. This card will contain information such as the name of the customer, the address, profession, passport number(if any), date of arrival, date of departure, the place of arrival and destination etc. on the same card, some spaces are reserved for official use. These are the places where the staff of the hotel will fill some pieces of information about the customer such as the room number eventually allocated, the number of guest accompanying him, the deposit rate of the room, the bill number and the signature of the staff etc.

Method of Allocation

Having collected the necessary information about the customer, the receptionist now uses from the reservation chart to confirm which of the room sort by the customer is vacant and then allocates it to the customer. However, some customers are given privilege to select not only the type of room sort, but also the particular room sort under that type.

The reservation chart is a very wide chart divided into rows and columns. The row header bears the date and the day of the month and the column titles bear the room numbers, the remaining space(between the rooms and columns) is divided into small boxes.

When a room is reserved or allocated or booked in advance, the chart is marked by spelling (and spreading) the name of the intending customer under the days booked and against the room number sort. When eventually, the customer turns up for allocation that is assuming the reservation was made by telephone, after conducting the booking procedure mentioned earlier, the information contained in the guest registration card is entered into a register kept by the receptionist.

Other pieces of information entered into the register includes the actual time arrived, the departure time, thus register is normally used in monitoring guest movement especially when enquiries are made by visitors

Customer Exit

The process of a customer's exit varies from time to time, but generally follows a particular pattern. The departing customers will submit the key to his room at the reception section and proceeds to the accounts section to conclude the financial aspects of transaction. At the account section, the initial deposit of the customer is compared with his actual (final) bill on the customer's bill sheet, and if found to greater, the customer pays the balance in cash. However, some special customers (mentioned earlier) are given the privilege of paying their bill with a bank cheque. On the other hand, if the initial deposit is less than the final bill the customer will be refunded with the surplus.

MATERIALS AND METHOD

Methodologies are comprehensive, multiple-step approaches to systems developments that will guide people's work and influence the quality of the final product. Most methodologies incorporate several development techniques. The systematic procedure by which a complex or scientific task is accomplished is called techniques. Techniques are particular processes that will follow by, to ensure that the work is well thought-out, complete and comprehensible to others. The HMS is a mobile application where this system is connected to the internet. The detail of the methodology and approach adopted are described as follow.

Architectural Framework of Online computerized Hotel Management System

In this paper, an architectural framework for an online Hotel management system is developed and presented in Figure 1. The framework highlights the structure of the developed system together with the way they interactions with each other.

The architecture of the system shows constraints imposed by the user requirements and the available technology.

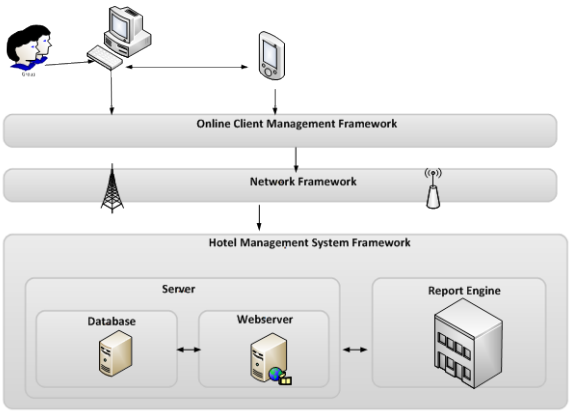

Figure 1: Architectural Framework of Hotel Management System

The diagram shown in figure 3a is an architecture framework of the designed system. The following components are noticeable:

i. **Database**: The database is a fundamental part of the system. It is also called as the working storage and it works hand in hand with both the knowledge base and the inference engine as a means of storing data. It stores all important and detailed information of the HMS and that of the administrator. Besides, it stores the detail set of prerecorded messages dropped by user, which are suitable for different guidance cases. In addition, the database server has both temporal validity and precise timing constrains which allow it to store the most recent data and effect instant changes as soon as they occur.
ii. **Web server**: Is the gateway application that enables you and your applications to send/receive internet messages through internet devices to your computer. It has an easy to use user interface, and an excellent internal architecture. The designed system is a web based application, therefore, there is a need to put up a web server. The web server used in this research work is Internet Information Service IIS.
iii. **Network Signal**: This layer is an intermediate layer between the designed framework and the online client who is accessing the application from his own personal computer. The described network can either be local area network LAN or the wide area network (WAN).
iv. **Users of the designed System:** The user of the designed system can access the HMS with either their personal computers or their phones.

Database design of Online computerized Hotel Management System

This helps to manage or structure their data in a logical way. In addition, database design is a process to produce detailed data model of a data-base. The detailed data model consists of detailed value parameters, attributes, primary key, foreign key and relationship between entities. The designing of the database needs an excellent developer's understanding of two criteria which are the domain area and database development. Effective database design can assist developer to perform well from the beginning. In addition, it can reduce costs and time during development process. An excellent database development is important to get an optimal performance and high productivity. In order to achieve the quality of system, the structure Figure 2 has to be properly presented which representing information in the database design to ensure the database works properly.

Conceptual modeling of Online computerized Hotel Management System

The emphasis of logical database model is on logic, which is a readable method and useful for representing the knowledge. This can be done through the conceptual modeling Conceptual modeling is a process to model data of domain. Conceptual modeling is a well-known technique of data modeling. It represents domain entities, meaning of the data, concepts or terms used by domain experts, function or relationship between concepts. Conceptual model, also known as conceptual level schema as shown in Figure 2, is a part of the process in database design which determines information needs of user. It is able to provide an accurate, complete representation of one's' understanding of the domain, with adaptation for different purposes. Figure 3 show the use case that list of steps, typically defining interactions between a role of each modules perform. Figures 4 and 5 describes the interface used for room reservation

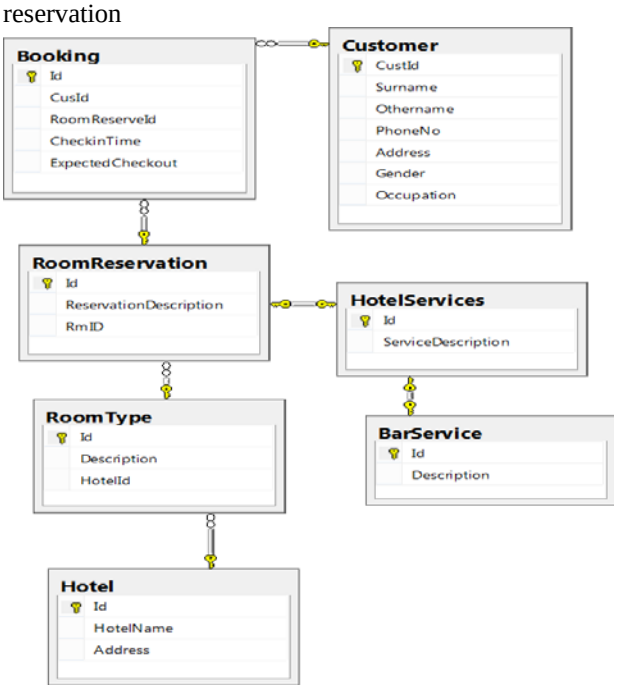

Figure 2: Database structure of the system

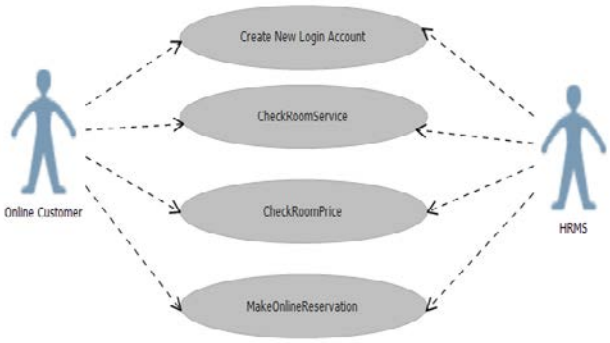

Figure 3: Use case of the System

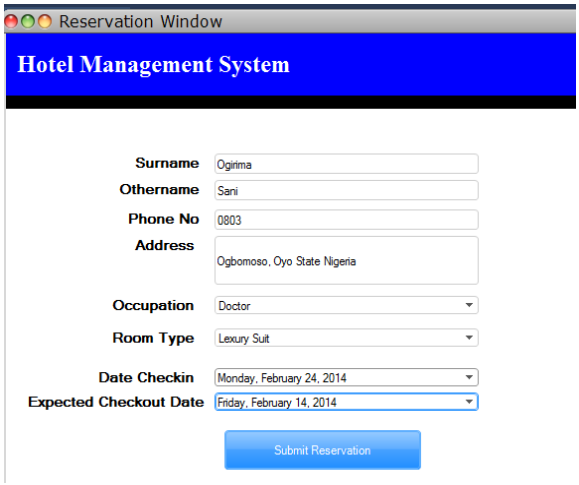

Figure 4: Reservation Interface

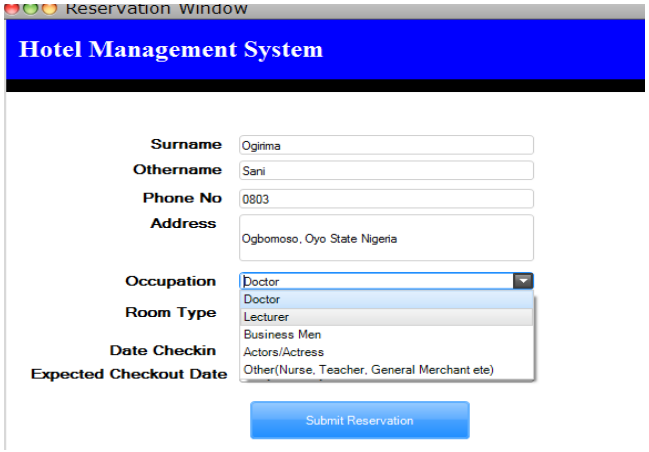

Figure 5: Reservation Interface

Comparative Evaluation Factors

First, a pilot study, in which a number of personal unstructured interviews with different people of several occupational diversity such as Lecturers, Doctor, Business men, Actor/Actress and others, was conducted. This was done to discuss the purpose of the research study. Since all factors to investigate users preferred platform to accessing HMS could be numerous, it implies that given an objective to ensure quality of hotel service and applications, much emphasis must be channeled to the critical factors. These factors are the most important measures relative to high turnaround time, efficiency of service and user satisfaction; therefore preference must be accorded them. These basic factors are independent of one another and can significantly influence the user's choice of a platform to access HMS.

They include:

(a) **Privacy:** A system should offer privacy in terms of confidentiality, integrity and availability to authorized entities. A computational system that ensures privacy for both users and applications in term of intrusion prevention is always preferred.

(b) **Security / data protection:** When resources in a system come from different, possibly competing, vendors, the openness of the system implies that the level of trustworthiness of information obtained through interactive environment would be low and strong security measures have to be in place to protect devices from one another. Complex system interactions might substantially complicate tracing the information flows to its origin, thus preventing users to judge the reliability of acquired information. Security can be used to measure how reliable and acceptable a system will be.

(c) **Cost:** Cost can be used to evaluate a number of models. A cost-effective model that is functional in nature can be preferred over an expensive one. A model which does not require infrastructure purchase will lower maintenance.

(d) **Accessibility/Mobility:** User mobility refers to the freedom the user has to move about when interacting with the system. Object mobility is required to move services around a network for better load balancing, fault tolerance and high-availability.

(e) **Usage Simplicity:** A well-structured graphical user interface and tool tips to guide the users is highly important. Help files are also tools to help the user get familiarized with the application environment and aid usage knowledge of the technical part of the system.

Research Questions

(i) Is accessing online HMS via web more cost-effective than the conventional manual approach vice-versa?

(ii) Is online HMS more secured in practice than the conventional manual approach or vice-versa?

(iii) What is the level of privacy when using web or mobile to access EPAs?

(iv) What is the level of mobility (accessibility & availability) of the HMS deployed on web and the conventional manual approach?

(v) How easy is it using online HMS and the conventional manual Hotel Reservation?

The Study Area and Sample Size

The population of the study comprises of the entire health service providers and patients at the Satellite Motel situated in Ilorin, Kwara State, Nigeria. The correspondents are of various occupational diversities which are: Lecturers, Doctor, Business men, Actor/Actress and Other (Nurse, Teacher, General Merchant etc.). Consequently, there was adoption of a purposive technique to determine those to be interviewed (sample size) because the population in the study area is large. Purposive sample is drawn to aid the ease of data collection or special features of the members of the sample. Therefore, the selection of the respondents was based on identification made by the occupation with travelling and lodging description in the study area of those who can serve the research purpose.

A total of one hundred (100) copies of questionnaire were distributed to these respondents from diverse educational background while ninety(90) copies were returned, representing a response rate of 90% as follows:

i. Doctor = 12
ii. Lecturer = 20
iii. Business Expert=5
iv. Actor/Actress = 15
v. Others (Nurse, Teacher, General Merchant etc.)=38

The respondents were asked to indicate the factor (s), according to how strong each feels, that can significantly influence the choice of Online Hotel Management System (HMS) or Conventional Manual Method of booking.

Data Collection Instrument

A well-structured questionnaire and oral interviews were used to gather primary data for the study. The questionnaire was validated and tested for reliability. A Cronbach alpha reliability co-efficient of $\alpha = 0.72$ was achieved.

Method and Tools for Data Analysis

Microsoft Excel was used to capture and analyze the data obtained from the duly-filled copies of questionnaire while frequency and percentage distributions were the descriptive techniques used. The descriptive survey was adopted to obtain the opinion of a representative sample of the target population so as to be able to infer the perception of the entire population.

RESULT AND DISCUSSION

Figure 6 displays the information about the rooms if it is occupied or not. Figure 7 and Figure 8 shows the customers details and the amount paid in respect to the rooms respectively.

Id	ReservationDe...	RmID	ExpectedAmo...	ExpectedDeposit	Remarks
1	Luxury	1	6000	4500	Empty
2	Luxury	2	6000	4500	Occupied
3	Twin	1	10000	8000	Empty
4	Twin	2	10000	8000	Empy

Figure 6: Room analysis report

CustId	Surname	Othername	PhoneNo	Address	Gender
1	Koyejo	Tolulope	0803029954	Apake Ogbom...	Male
2	Ogundipe	Peter	08182186985	Mikky Ogbomo...	Male
3	Alabi	Issac	07035525706	Aroje Ogbomoso	Male
4	Kolapo	Tobi	08136817723	Safejo Ogbomo...	Male
5	Ilori	Oluwatomiwo	08189074597	Olomi Ogbom...	Male
6	Owolo	Fissayo	08182171395	Caretaker Ogbo...	Male
7	Koyejo	Peace	08081230467	Apake Ogbom...	Female
8	Ogundipe	Sharon	08056789875	Taki Ogbomoso	Female
9	Oladele	Grace	08067876543	Seminary Ogbo...	Female
10	Oludele	Toyin	08097654321	Olomi Ogbom...	Female

Figure7: Room Occupants details

Id	Surname	Othername	ArrivalDate	DepartureDate	RoomOccupi...	AmountPaid
1	Awode	Tolulope	10/1/2014	20/1/2014	Room 1	60000
2	Ogirima	Sanni	2/3/2014	7/3/2014	Room 5	30000
3	Akinrinade	Olajide	2/3/2014	5/3/2014	Room 10	12000
4	Ibrahim	Musa	5/3/2014	8/3/2014	Room 6	18000

Figure 8: Income Room analysis report

The assessment carried out in this work was based on users' preference of a chosen platform to use online HMS in terms of security, cost, ease of usage, privacy and mobility of the system. In figure 9, the gender distribution of the respondents is presented; while 65% of the respondents are male, 35% are female.

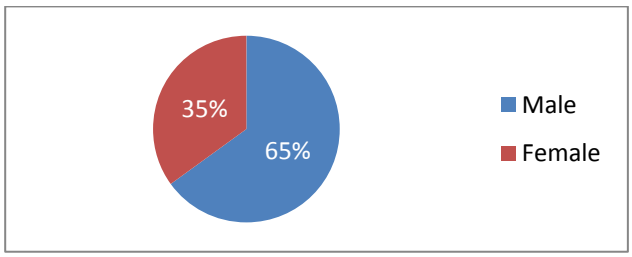

Figure 9: Gender Distribution of Respondents

However, Figure 10 shows the distribution of occupation of the respondents in the study area. The degree of responsiveness of the respondents decreases from the respondents in order of their professions.

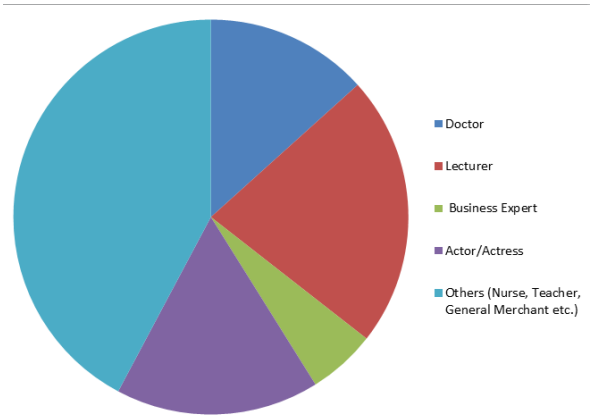

Figure 10: Distribution of Respondents Occupation

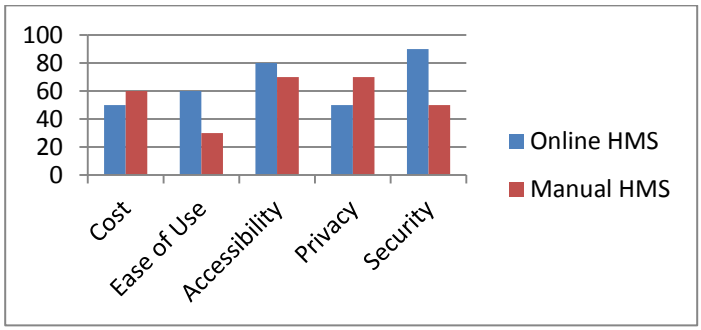

Figure 11: Results of Usage Adoption Assessments of Online HMS and Manual Hotel Management System

The evaluated result obtained from respondents' data analyzed using Microsoft excel's descriptive techniques including frequency and percentages, salient factors that can influence users' choice of a preferred platform to online HMS, is presented in Figure 11. This result is influenced by the frequency of respondents' choice of the salient factors that can impact the choice of a preferred platform to use Online HMS. The result indicates that users prefer online Hotel management to conventional Hotel management Services in terms of ease of use, accessibility and security in the study area. This result answers the research questions (i), (ii), (iii) and (iv) respectively.

CONCLUSION

In this paper, user preferred online hotel management system (HMS) to conventional Manual Hotel Processing as investigated. Privacy, mobility, ease-of-use, security and cost are preferential critical assessment factors considered to impact user's choice decision.

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