Design and Development of Online Hostel Management System to improve Application and Management Process

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Abstract The hotel industry is a business venture for the owner and a solace for the traveler and/or tourist. A customer can get stranded in the quest to secure a hotel room to pass the night if he has not made adequate plans by the existing system. Through this study, it was realized that for a customer to be guaranteed a room, he or she has to physically come to the hotel since the attendants paid more attention to that. He could also send a friend or relative who lives around the neighbourhood of the hotel to do the booking for him. There is nothing to bond the hotel and the customer in person that he has indeed booked for a room. This study took Hansonic Hotel as its case. It looked at creating an online booking system to enable customers choose the room they wanted after a virtual tour to guarantee him a room. The system aims at the maintenance and management of the different Hotels that are available in the different parts of the world. It mainly takes care of the Hotel management at the core area of the database. The system provides the information regarding the different Hotels that are available and their status specific to availability.

INDEX TERMS Design and analysis, Design introduction, Mysql database, Implementation and System testing

The Hotel Industry like any other business opens up socioeconomic opportunities for both owner and customer. It has the function of providing hospitality services to customers. These customers can be travelers, foreigners, businessmen, tourists, visitors, etc. Customers are mostly 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 the particular location, walk in and find out whether there is a vacant room. In the case that there is no vacant room, you have to move to next closest hotel to enquire once more. So what happens if you move around sometimes very late in the night in search of a room and all close by hotels are fully booked? Other times you may be lucky to have the contact number of the hotel to reach them to book for a room. But do the hotel attendants really ensure to keep a room for you? You would be lucky to go and get a room booked for you.

They are quick to serve those who walk in rather than those who may get access to them on phone to book a room. On other times too, if you have friends or family members in the area you want a room booked, they have to go and do the checking for you. This is amazing hotel for getting best user experience.

There is no system in place that bonds the hotel and the customer that the customer has actually booked a room and for that matter he is guaranteed a room. This can make customers really stranded especially if it is getting late in the night. It is in this light that this study looks at the activities at HANSONIC Hotel in Dansoman. Hansonic hotel was established in the 1973. It is a budget hotel meaning it is less than a one star hotel. It was established to provide accommodation and catering services for tourists, locals, foreigners who are in Accra to trade, rest, eat as well as those on vacation. Hansonic Hotel has a sister institution called Hans Cottage Hotel in Cape Coast. Hans Cottage Hotel compliments Hansonic hotel since it has a very spacious space to mainly receive tourists and holiday makers. It engages in tourist activities like Crocodile viewing, Fishing, Bird watching as well as Boat riding, Monkey Playing, etc. The hotel has other services for tourists like car rentals, swimming pool, tennis court, salon, etc. This makes both institutions very marketable because of their proximity. Hans Cottage Hotel is present online (www.hansbotelghana.com) and it displays the facilities they have but there is scanty information on the Hansonic Hotel. Though the Hans Hotel attracts more tourists because of its proximity in Cape Coast, Hansonic hotel also needs more online.

Hansonic hotel uses a manual booking system to date and likewise the Hans Botel. Normally when a the book for booking gets filled, it is damped elsewhere and sometimes disposed which is not a good practice as you cannot analyse data to see trends, and make proper planning. Management is not excited about this since they are not able to keep proper records or details. This obviously can limit their competitiveness since customers cannot book for a room from any location by themselves. The study therefore aimed at developing an online hotel reservation system to enable customers book for whatever they need from wherever location they are before lodging into the hotel. The system is to allow for easy access and retrieval of information and reporting. With such a system in place, Hansonic Hotel would be more competitive in Accra.

A hotel reservation system, commonly known as a central reservation system (CRS) is a computerized system that stores and distributes information of a hotel, resort or other lodging facilities (www.mindspeakit.com). A CRS offers assistance to hoteliers to manage all of their online marketing and sales where they can upload their rates and service availabilities to be seen by sales channels (www.mindspeakit.com). The list of main modules that are present in a CRS are: Content, Information stored on a CRS and Reporting.

such as location of hotel, room rates, room description and hotel facilities. The reservation process requires guests to fill their details on a reservation form. Reservation is guaranteed by giving credit card details or by cash deposit. The layout of their online system is clear and user-friendly. Guests can browse through to get information easily. This online system shows a picture of the hotel room. Guests are not able to view the whole picture of the room they are going to reserve but a picture is worth thousand words. Instead of using words to explain the room condition, it is more suitable for guests to have a virtual tour of the room they are going to stay in. This can increase customer satisfaction. The online system of Swiss-Garden is fully organized by its developer.

II. ANALYSIS AND DESIGN

A. ANALYSIS

The present scenario offers manual data entry. A lot of time is wasted in creating the reports as well as maintaining them. In case, if any query arises to get the information about the client, the whole report is re-typed or Xeroxed. This seriously affects the authentication of the system. This Client Management System is totally outdated and involves high risk of ambiguity and redundancy.

B. USER INTERFACE DESIGN

The webpage design helps users gain access to the information that the website presents. Users are given higher priority before any building can be done and for that matter the size of the system and the general outlook has to be taken into consideration.

There is an interface designed for the user and the administrator.

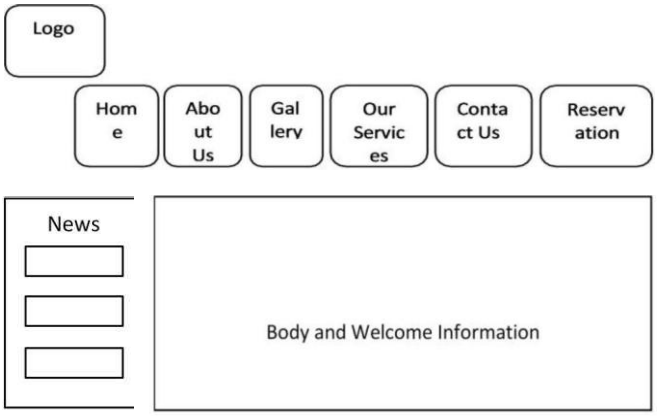


FIGURE 1. User Interface Design

C. ADMINISTRATOR INTERFACE DESIGN

The administrator interface has a log in feature for the administrator to gain access to the system.

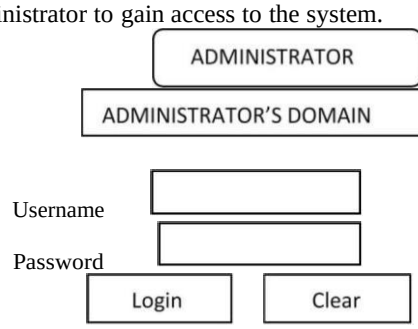


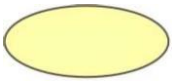
FIGURE 2. Administrator Interface Design

III. DESIGN INTRODUCTION

A. UML DIAGRAM

A coherent set of roles that users of use cases play when interacting with the use `cases. Use case: A description of sequence of actions, including variants, that a system performs that yields an observable result of value of an actor.

UML stands for Unified Modeling Language. UML is a language for specifying, visualizing and documenting the system. This is the step while developing any product after analysis. The goal from this is to produce a model of the entities involved in the project which later need to be built. The representation of the entities that are to be used in the product being developed need to be designed.



The representation of the entities that are to be used in the product being developed need to be designed.

B. ER DIAGRAM

The Entity-Relationship (ER) model was originally proposed by Peter in 1976 [Chen76] as a way to unify the network and relational database views. Simply stated the ER model is a conceptual data model that views the real world as entities and relationships. A basic component of the model is the Entity-Relationship diagram which is used to visually represent data objects. Since Chen wrote his paper the model has been extended and today it is commonly used for database design for the database designer, the utility of the ER model is:

It maps well to the relational model. The constructs used in the ER model can easily be transformed into relational tables.

It is simple and easy to understand with a minimum of training. Therefore, the model can be used by the database designer to communicate the design to the end user.

In addition, the model can be used as a design plan by the database developer to implement a data model in specific database management software.

C. ER NOTATION

There is no standard for representing data objects in ER diagrams. Each modeling methodology uses its own notation. The original notation used by Chen is widely used in academics texts and journals but rarely seen in either CASE tools or publications by non-academics. Today, there are a number of notations used; among the more common are Bachman, crow's foot, and IDEFIX.

All notational styles represent entities as rectangular boxes and relationships as lines connecting boxes. Each style uses a special set of symbols to represent the cardinality of a connection. The notation used in this document is from Martin. The symbols used for the basic ER constructs are:

- **Entities** are represented by labeled rectangles. The label is the name of the entity. Entity names should be singular nouns.
- **Relationships** are represented by a solid line connecting two entities. The name of the relationship is written above the line. Relationship names should be verbs.
- **Attributes**, when included, are listed inside the entity rectangle. Attributes which are identifiers are underlined. Attribute names should be singular nouns.
- **Cardinality** of many is represented by a line ending in a crow's foot. If the crow's foot is omitted, the cardinality is one.

ER Model stands for Entity Relationship Model is a high-level conceptual data model diagram. ER model helps to systematically analyze data requirements to produce a well-designed database. The ER Model represents real-world entities and the relationships between them. Creating an ER Model in DBMS is considered as a best practice before implementing your database.

Existence is represented by placing a circle or a perpendicular bar on the line. Mandatory existence is shown by the bar (looks like a 1) next to the entity for an instance is required. Optional existence is shown by placing a circle next to the entity that is optional. Are you new to ER Diagrams and need a quick guide regarding the basics? Do not worry; we have it covered. This guide serves to assist you in any queries you may have regarding **ER diagram symbols and notations.**

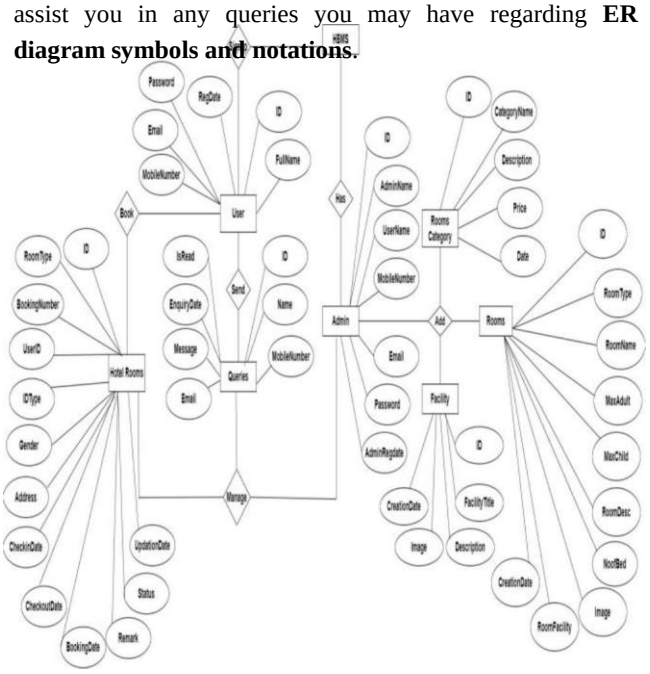


FIGURE 3. ER Daigram

C APPICATION

RDMBS is the most frequently used in real life. It has wide applications area. Some major applications where it is used are as follow:

1. It is used for maintaining small as well as large databases of the firms, companies and organizations

2. It is used for managing inventory and stock, payroll etc.

3. It is used as an analysis tool for managing and processing data warehouses and data mining for better understanding and decision making.

4. It is used for recording and managing day to day activities and transactions such as production, stalling, income and expenses, purchase.

5. Used in hospitals, banks, railway, school, colleges for managing their routine activities.

6. It is used for financial planning and developing business strategy.

7. It can be useful for monitoring financial and economical state of the organization.

IV. MYSQL DATABASE

A. RELATIONAL DATABASE

A relational database management system (RDBMS) is a collection of programs and capabilities that enable IT teams and others to create, update, administer and otherwise interact with a relational database. RDBMS store data in the form of tables, with most commercial relational database management systems using Structured Query Language (SQL) to access the database. However, since SQL was invented after the initial development of the relational model, it is not necessary for RDBMS use. The RDBMS is the most popular database system among organizations across the world. It provides a dependable method of storing and retrieving large amounts of data while offering a combination of system performance and ease of implementation. As mentioned before, an RDBMS will store data in the form of a table. Each system will have varying numbers of tables with each table possessing its own unique primary key. The primary key is then used to identify each table. Within the table are rows and columns. The rows are known as records or horizontal entities; they contain the information for the individual entry. The columns are known as vertical entities and possess information about the specific field.

B. CREATING AND CONNECTING MYSQL DATABASE

Creating a database oriented dynamic webpage needs to create and connect a database so that data which will filled on the website getting stored in a structured oriented database. In order to access and manage database, we have to any local host provider tools like XAMPP which gives access to create and connect database on PhpMyAdmin local host. The database creation and connection with PHP dynamic website are described in fig 4:

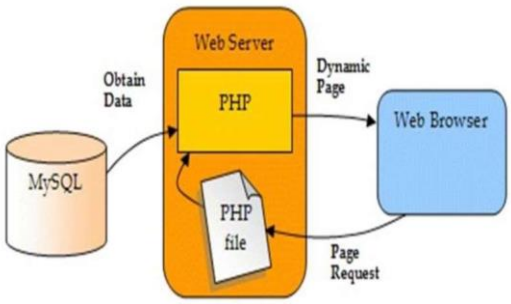


FIGURE 4. Database Creation and Connection

D. TECHNICAL CONFIGURATION FOR DATABASES

```
Php MyAdmin SQL Dump
-- version 4.9.0.1
-- PHP Version: 7.2.1
-- https://www.phpmyadmin.net/
-- Host: 127.0.0.1
-- Server version: 10.3.15-MariDB
```

E. Code to connecting Database

```
$servername="localhost";
$username="root";
$password=" 123";
$database="hbmsdb";
$conn=Mysqli_connect ( &servername , &username, &password );
```

F. Code to Creating Database

```
$Sql="create DATABASES covidtmsdb";
$Result=mysqli_query ( &conn , &sql );
```

G. Tables

AdminTable :(Table name is admin)
This store admin personal and login details.

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	ID	int(10)			No	None		AUTO_INCREMENT
2	AdminName	varchar(120)	latin1_swedish_ci		Yes	NULL		
3	UserName	varchar(120)	latin1_swedish_ci		Yes	NULL		
4	MobileNumber	bigint(10)			Yes	NULL		
5	Email	varchar(200)	latin1_swedish_ci		Yes	NULL		
6	Password	varchar(120)	latin1_swedish_ci		Yes	NULL		
7	AdminRegdate	timestamp			Yes	current_timestamp()		

TABLE 1. Admin Details

Booking Table (Table name is tblbooking)
This store the detail of room booking

#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra
1	ID	int(10)			No	None		AUTO_INCREMENT
2	RoomType	int(5)			Yes	NULL		
3	BookingNumber	varchar(120)	utf8mb4_general_ci		Yes	NULL		
4	UserID	int(5)			No	None		
5	IDType	varchar(120)	utf8mb4_general_ci		Yes	NULL		
6	Gender	varchar(50)	utf8mb4_general_ci		Yes	NULL		
7	Address	mediumtext	utf8mb4_general_ci		Yes			
8	CheckinDate	varchar(200)	utf8mb4_general_ci		Yes	NULL		
9	CheckoutDate	varchar(200)	utf8mb4_general_ci		Yes	NULL		
10	BookingDate	timestamp			Yes	current_timestamp()		
11	Remark	varchar(50)	utf8mb4_general_ci		Yes	NULL		
12	Status	varchar(50)	utf8mb4_general_ci		Yes	NULL		
13	UpdationDate	timestamp			Yes	NULL		ON UPDATE CURRENT_TIMESTAMP()

TABLE 2. Booking Details

V. IMPLEMENTATION AND SYSTEM TESTING

After all phase have been perfectly done, the system will be implemented to the server and the system can be used.

A. System Testing

The goal of the system testing process was to determine all faults in our project .The program was subjected to a set of test inputs and many explanations were made and based on these explanations it will be decided whether the program behaves as expected or not. Our Project went through two levels of testing.

1. Unit testing
2. Integration testing

1. Unit testing

Unit testing is commenced when a unit has been created and effectively reviewed .In order to test a single module we need to provide a complete environment i.e. besides the section we would require.

- The procedures belonging to other units that the unit under test calls.
- Non local data structures that module accesses.
- A procedure to call the functions of the unit under test with appropriate parameters.

2. Integration testing

In the Integration testing we test various combination of the project module by providing the input. The primary objective is to test the module interfaces in order to confirm that no errors are occurring when one module invokes the other module.

VI. CONCLUSION

This Application provides a computerized and automated version of Hotel Booking Management System which will benefit the hotel companies and their users. It makes entire process online and can generate reports. It has a facility of user's login where users can view their booking details.

The Application was designed in such a way that future changes can be done easily. The following conclusions can be deduced from the development of the project.

- Automation of the entire system improves the productivity.
- It provides a friendly graphical user interface which proves to be better when compared to the existing system.
- It gives appropriate access to the authorized users depending on their permissions.
- It effectively overcomes the delay in communications.
- Updating of information becomes so easier.
- System security, data security and reliability are the striking features.
- The System has adequate scope for modification in future if it is necessary.

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