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A CUSTOMER-CENTRIC APPLICATION FOR A CINEMA HOUSE

Abstract

Imagine a cinema with different branches and because of diverse regions, there may be a need to have different services for such regions. Uniformity is needed for systems like this. In this research, we developed a customer-centric online booking system for a cinema house called FLOW Inc. We used Hypertext Mark-Up Language, Cascading Style Sheet and JavaScript for the front end and MySQL database as the back end; and PHP as the scripting language. The system was implemented using the XAMPP package and Apache as the server. It was successfully tested on a computer system with a 4GB RAM and a CORE i5 processor with a processor speed of 2.16GHz.

1. INTRODUCTION

Over the years in our contemporary world, the cry for autonomy and restructuring in several sectors have been growing wildly, everyone wants to be independent. A child wants to gain freedom as fast as possible, a local government wants autonomy, and states are clamoring for restructuring so that it could be easier to split

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problems and successes according to their knowledge. Although I do not tend to support or oppose autonomy and independence for selfish gains, I believe it could be of help in building a web-based application. Building an e-Commerce system with individual customers in mind as a different entity would mean each unit in an organization solves their problems individually and expertly to soothe customers. A marketing department should know what best to do with its interface better than when a jack of all trades is handling it

With the noticeable growth in the cinema industry in Nigeria and as the Nigerian Communications Commission (NCC) reported that the number of internet users in Nigeria as at December 2018 was about 111.6 million persons (Edubi, 2019). With this statistic, information technology can help customers in this regard through online booking to easily access the cinema services as well as book and make payments online. This system has kicked off in the country already although not much people are using the system because of trust issues (Benedict, 2018) and its irregularities as I once experienced at a top Nigerian cinema house, the system still seems to have a long way to go in order to be widely accepted in this nation.

1.1. E-commerce and e-booking

It has not been so long e-commerce was birthed. It is a very recent occurrence of the late 90s; the journey has been brief but interesting. The early years were a time of explosive growth and extraordinary innovation, beginning in 1995 with the first widespread use of the Web to advertise products. This period was capped in March 2000 when stock market valuations for dot.com companies reached their peak and later began to collapse. A period of reassessment occurred, followed by strong double-digit growth through the current period. The misconception about e-Commerce being just about buying and selling also led to an extensive description of e-Commerce and Kalakota and Whinston (1997), defined e-Commerce as a range of different perspectives. They are:

1. A communication perspective: this is the delivery of information, products or services or payments by electronic means.
2. A business perspective: this is the application of technology towards the automation of business transactions and workflow.
3. A service perspective: this is enabling cost-cutting at the same time as increasing the speed and quality of service delivery.
4. An online perspective: this is the buying and selling of products and information online.

From this definition, it can be seen that most people only see one perspective of e-Commerce and fail to see the other sides of e-Commerce. It also includes some presale and post-sale activities.

E-Booking, on another hand, is making a reservation or appointment for a service via the internet. With the e-booking system, customers can book for show tickets online and pay via the internet beforehand using their credit cards, master cards, etc. After a booking has been made online, the customer will receive a code or serial number which will be unique for entry and also a form or ticket with the code on it will be printed by the user which will also have the passport of the user on it for security against thieves. With the code, the user can also go online to request for another ticket in case the ticket gets lost or stolen. This differs a lot from the traditional queuing for tickets or to book for tickets for very long hours, in this system a traditional database. The details of the e-Booking transaction are automatically recorded in the database on confirmation of payment and as such the database can be easily transferable from one place or computer to another.

There are other times when a customer wishes to make inquiries concerning certain products or service but in the traditional method of e-Commerce, the user would have to make these inquiries in person no matter how busy he or she is. There are periods when the phone lines of the organization might be busy or unavailable when enquiries need to be made making the client still need to come physically to check for the good or product needed. There are also times when lots of customers will come to enquire about certain goods and services at the same time thereby causing long waits before being able to access the customer service.

Thankfully, we have the media but not everyone subscribes to every available channel of the media and even those who do might still miss whatever advert or promotional offer a company puts up for their products or services and this goes a long way to say that people will be ignorant of whatever freebies a company provides to the society and because people will still need to visit the store to find out, it does not help to promote their business as much as they would like. Clients who do not have any of the media facilities might rather go to stores nearby because they are ignorant of the freebie your business offers.

2. RELATED WORKS

Enache, (2018) developed an Event Ticketing Software. The participants can buy tickets or register for free events and planners have information about the guest list. The system also simplifies the registration process for participants and can receive payment before an event and can organize the daily registration process. The project works with a database that runs on the MySQL server while the front end runs on a JavaScript and HTML. The system addressed critical design and implementation issues for an Event Ticketing System and the potential problems for such a fully automated, high-availability system. However, the security of the system is not guaranteed i.e. user details may not be so secure.

Akinyede, et al., (2017) developed an online booking system for a cinema house to cater for the stress that arises as a result of queuing manually in cinemas The hustling and jostling in the cinema houses will also be reduced through the system implementation. The system was implemented with design components such as web browsers, HTML, CSS, JavaScript, PHP, a web server and a relational database (MySQL). The system is also designed to help improve the rate at which people watch movies in Nigeria's cinemas. However, the limitation of this work as interesting as it looked was that there was no room for feature updates or components upgrading.

Kujanpää, (2018) developed a new browser-based online booking system for the Turku University of Applied Sciences Cisco Laboratory. This system was birthed because the current system was out-dated and system functionalities and user interface requirements needed to be updated and to improve the usability and the security of the system. PHP5 and MySQL were used as development tools for the server-side development and Twitter Bootstrap front-end framework including HTML, JavaScript, and CSS for the browser side. It concentrated on how to develop a booking system for a specific situation and how to achieve the best results on the front and back-end. However, the limitation of this work was that the development was to meet a specific need and isn't flexible enough to meet other booking needs in the institution.

Yang, (2012) developed a Homestay online booking and management system. This system was developed for ease of access for global voyagers who need better and cheap accommodation to Homestay via the web and other computers aided tools and to simplify the booking process and to also enable searching and database synchronization. The system uses the first come first principle for customers. The user interacts with the system via the system interface design with PHP to the database design developed with Microsoft Access. This system was developed by using Microsoft Visual Basic. NET. The system was developed in such a way that Customers can; check room availability and homestay information, leave a message for each homestay, book the available room/house through the internet. While Homestay Keepers can update the information of the rooms, answer notes and follow the customers' message. However, the system was designed only for people in a particular region called Kuantan while finance also proved a major threat to the system.

Mateos, et al., (2012) developed a rig booking system designed for the LiLa (Library Laboratory) Portal, a web portal that makes virtual and remote experiments available on the Internet. This system was developed to maximize the student access to the experiments, to schedule access to the remote experiments and to accommodate as many students as possible and to help them organize their activities in the portal. The system runs on an application server and uses a database to persist experiment information and user interactions. It also provides an interface that allows searching, classifying and commenting experiments; and makes the experiments available on the Internet. The system describes a solution

to control access to virtual laboratories and remote experiments using learning objects, it gives schools the flexibility of accessing the system functionalities via their own Learning Management Systems and simplifies interchange. However, there is still a need for improving the metadata-based search functionality to help teachers find the experiments they can include in their courses and there is also still a need for improving the access control to help content providers verifying the users accessing remote experiments through the system.

Hang (2011) designed and implemented a Cinema Online Booking System. This system was developed to ease booking transactions, thereby reducing on-site manpower requirements and to allow the industry to focus on improving other services. The system was developed on JSP (Java Server Pages) and the server-side execution environment required Apache Jakarta Tomcat 5.0, Java 2 Platform, Standard Edition (J2SE), v 1.5, and MySQL 5.0, the client-side was designed with JavaScript. The system enabled High efficiency and Low-cost ticketing network management system. However, the seats to be booked are automatically selected for the user.

Björk (2011) worked on Adapting a Hotel Reservation System to Camping Reservation. This was done to evaluate how to adapt the IBE for camping reservations. The system will also be used by the marketing department to sell the concept of a reservation system to chains of campgrounds. A review of existing reservation systems and a user survey was conducted. IBE (Internet Booking Engine) was proposed for the client-side program while the implementation was done in Java and Wicket, a Java-based web framework developed by the Apache Foundation. Critical design and implementation issues for an Event Ticketing System and the potential problems for such a fully automated, high-availability system was arrived at after the work was done. However, in the system, no features, such as an interactive map of the campground was used and also, the IBM was a little underdeveloped during the project, therefore, causing complications in making changes to the program

Fragidis (2007) developed A Service Model for Customer-Centric Electronic Business. This was done to analyze customer participation in services and considered the value-adding opportunity being offered and prepare a service model for it from the data collated. A conceptual framework was then designed for customer participation in services based on customer needs, the services being offered and its outcomes. A service model was brought forward which would cater to the association of needs, services, and experiences. However, in this model, situational needs (constraints of services) were not catered for – e.g. a four-member family cannot rent a two-seat car or a pet owner cannot go to hotels that do not allow pets and also there was no room for extending the required services (e.g. an elder needing assistance going to the theatre).

3. SYSTEM ANALYSIS AND DESIGN

The system architecture is divided into three (3) tiers namely: Front tier, Middle tier, and Back tier. These also form the components that were used to design the system. The tools used in carrying out this task will be HTML (Hypertext Mark-up Language) which incorporated the CSS (Cascading Style Sheet) and Java Scripts for the front-end design. PHP (Hypertext Preprocessor) will be the programming language that used as the middle tier, which will establish the connection between the backend and frontend of the system. The application backend consists of a MySQL database. This stores all the necessary information about the administrator and users of the system. The application also allows multiple ticket purchases and as such tables were designed to have space for it. Figure 1 describes the main components and architecture model of the system and how they interact with each other.
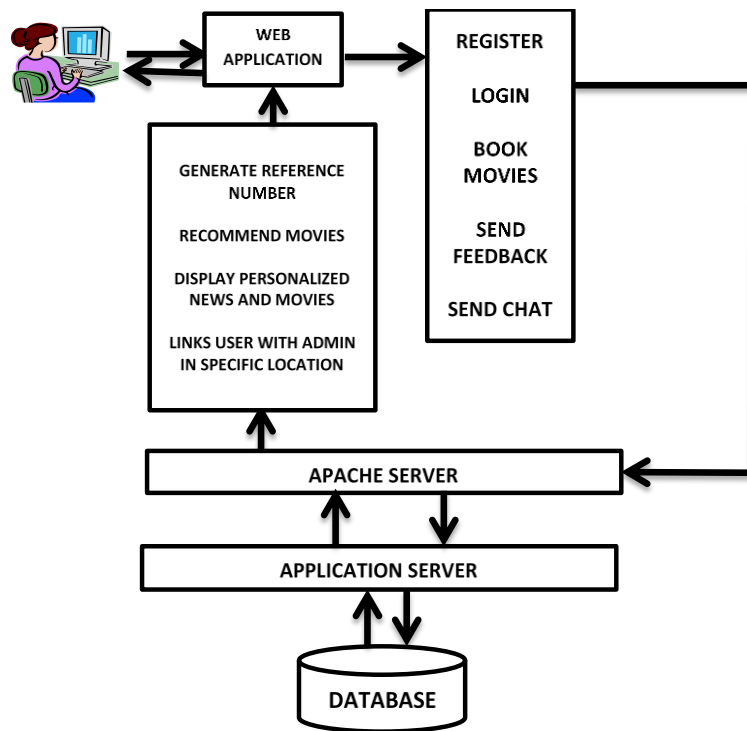

Fig. 1. System Architecture

73

3.1. Mathematical Model of the System

In integrating the news, promotional updates and movies on the system.

Let the news N_m be such that $N_m = \{N_0, N_1, N_2, N_3 \ldots \ldots N_{k-1}, N_k\}$, let the Promotional offers O_m be such that $O_m = \{O_0, O_1, O_2, O_3 \ldots \ldots O_{k-1}, O_k\}$ and let the uploaded movies U_m be such that $U_m = \{U_0, U_1, U_2, U_3 \ldots \ldots U_{k-1}, U_k\}$.

Where m represents individual movies. Therefore, the total number of uploaded news N:

$$\sum N = N_k. \tag{1}$$

The total number of Promotional offers O:

$$\sum O = N_k. \tag{2}$$

The total number of uploaded movies (U):

$$\sum U = U_k. \tag{3}$$

Every functioning cinema house will have available movies currently showing or that will be shown later. There is no cinema without a movie showing, therefore concerning this, the number of available movies (M) is:

$$M \leq \mathrm{U} : M \geq 1.$$

To get the total sale amount, the following assumptions are made:
S = the total number of seats.

$A_{mk}, k = 1, 2, 3, 4, \ldots, z$ are available seats for each movie.

$A_{mk} = A_{m1}, A_{m2}, A_{m3}, \ldots \ldots A_{mz}$ (where z is the number of the last seat – if the seats in a theatre are 25 in all, then z will be 25):

$$A_m = \sum_{k=0}^{z} A_{m,k}, \tag{4}$$

where A_m – total number of available seats for each movie,

$$UA_m = S - A_m, \tag{5}$$

where UA_m – total number of unavailable seats.

Let the selected seats (SS_m) by customer (c) be $SS_{m,c}, \; c = 1,2,3, \ldots, n$: $SS_{m,c} \in A_{m,k}$. The total number of selected seats for each movie (SS_m) be:

$$SS_m = \sum_{c=0}^{n} SS_{m,c}. \tag{6}$$

The number of unbooked seats (US_m) will therefore be:

$$US_m = S - SS_m. \tag{7}$$

The seats will be termed as full and un-selectable anymore or customers will be unable to book any more seats if (6) = (4) or if (7) = 0 – i.e. $SS_m = A_m$ or $US_m = 0$.

Unbooked seats mean that the seats aren't filled up by the customers whereas the unavailable seats mean seats that have been either booked by other customers or for some reason are not up for sale in that theatre. There can be several reasons for a seat not to be available in a theatre.

Let the total sale per movie (T_m) be

$$T_m = SS_m * P_m, \tag{8}$$

where P_m, is the price per movie.

4. SYSTEMS IMPLEMENTATION AND RESULTS

The user interface is such that the users would have a wonderful user experience tailored particularly for them. The administrators would also be given power to ensure that the users get what is peculiar to them. The choice of colors, images and the flow of the site is such that they are designed according to standard patterns. For example, the system contains a logo instead of the name of the website so that the header would not be too cumbersome; the top film banners are in a slide bar to make the site look more interesting and dynamic.

The user interface is separated into two, that of the administrator and the customer. The administrator's interface which is entirely different from the customer's interface is used for managing the website majorly. Below are some screenshots of what the website looks like.
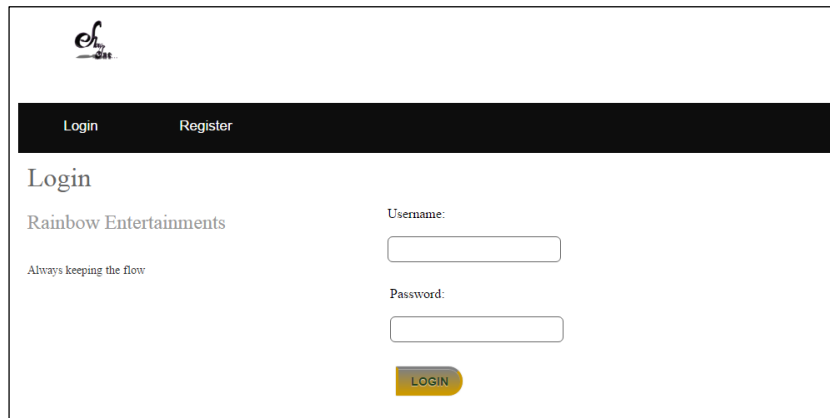

Fig. 2. Login Page of the User

75

Fig. 3. Register page for the user

This login page in Figure 2 is for the user to log into the system to be able to access information and other activities on the website while the register page for new customers to create an account is shown in Figure 3.

The homepage, which the user will be directed to after successful entry into the website, is shown in Figure 4. It shows the major things which the site entails. It also displays information peculiar to the user. The user will also get to access news and promotional offers from the homepage. The space for searching for a movie is also done on the homepage after which the user proceeds to book.

From Figure 4, a user from Lagos is already getting tailored information about Lagos; if the Location of the user were in Akure, only information about Akure users will be displayed on his or her homepage.

The movie details page in Figure 5 is for viewing basic information about a particular movie selected on the page by the user.

A young man and his friends embark upon the road trip of their lives to find the missing girl next doo

Magic Mike

Three years after Mike bowed out of the stripper life his gang, he and the rem... Tampa hit the Myrtle Beach to... out on d... performance...

| View Details | View Details | View Details | View Details | View Details |

| View Details | View Details | View Details | View Details |

Note: Services for Promotional offers and other offers you wish to enjoy will be offered in each of the centers.

Gbe Body E!	Gbe body E! when its between 8am and 12noon on Monday to watch any movie at a discount rate of 40%
Sanwo Olu is a goal	The incoming Lagos State governor is already living up to his name and has paid for the first 50 Lagosians that will come on Saturday to watch Avengers: The end game
50% off for Lagosians!	All citizens of Lagos will be able to watch any two movies for the price of ONE!!! Yipee!!!

Fig. 4. Homepage for the user

localhost
Apache/2.4.17 (Win32) OpenSSL/1.0.2d PHP/5.6.20

FIGHTER EGY 2 (RATED-PG 15)

GENRE:Nollywood

Synopsis: Oluwafemi Ige starts in this blockbuster movie again. The Isubu Akoni crooner stars as the mighty but will he also fall in this movie or lift high his head after the end of all the wars and temptations that should come his way?

MAD MAX:Fury Road (RATED-18)

God's not dead

FEATURING:Oluwafemi Ige, Oluwadamilare Ige, Iyadunni Alabi, Oreoluwa Tosin, Samuel Ajakaye

Minutes:150

Price:2000

Venues

Akure
Lagos

Thursday-12:00 pm

Movie of the week:

Max Simkin repairs shoes in the same New York shop that has been in his family for generations. Disenchanted with the grind of daily life, Max...

Movie Info/book

Fig. 5. Movie details and book movie page for the user

Figure 6 shows the admin page which contains several hyperlinks that can be navigated to add movies, add news, upload banners and promotional offers as well as verify reference number. After users have successfully booked a movie, there is a need for verification from the administrators' end. When the user gets to the cinema house, with the reference number on the printed slip or peradventure a snapshot of the booking slip from the website, the administrator can confirm the time, venue and other details of the movie and the customer that booked. Once a customer has been verified, the booking number is marked as verified so that no other customer can use that number anymore.
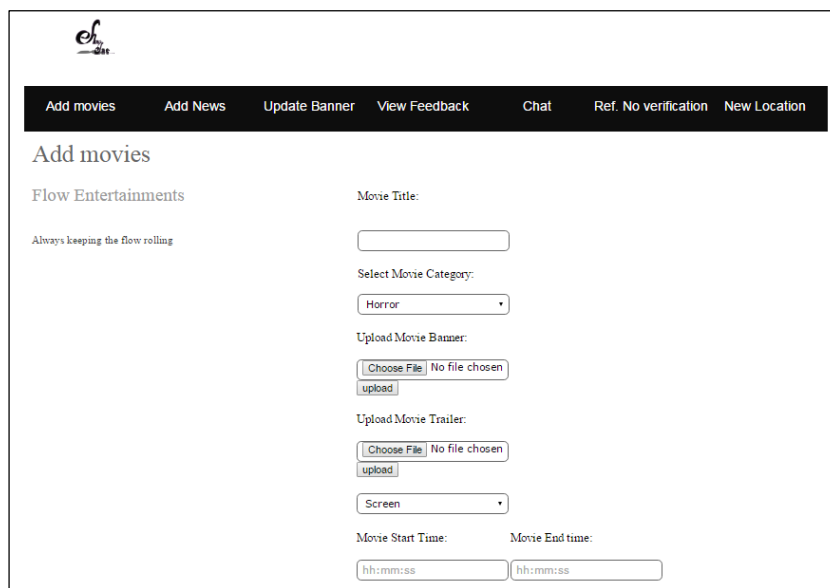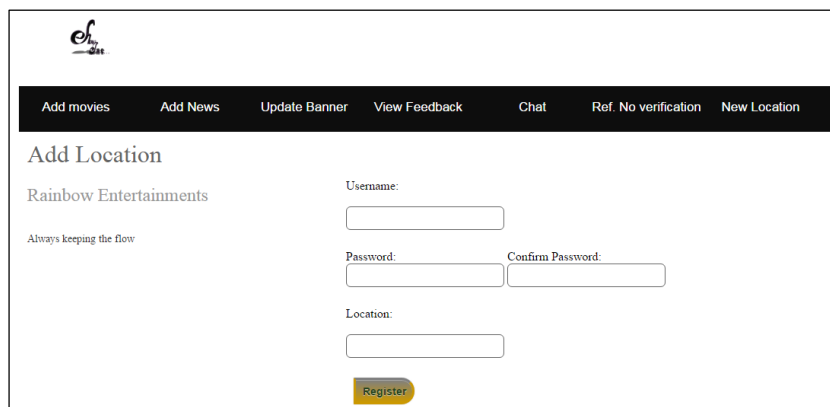

Fig. 6. Admin page

Fig. 7. Add location for overall admin

Movies can be added by the admin of different locations but once a movie is added by a Lagos admin, only people in Lagos can view the movie but a general admin can add movies to all and/or any location while the same scenario plays out for news and banner uploads.

The page that is not for the general admin doesn't have the New Location on the pane meaning only the general or overall administrator can add a new location anytime the cinema is birthed at a new place but as shown in Figure 7, the general admin can add a location in case the company expands.

5. CONCLUSION

It can be said with full assurance that if the system is fully implemented, all the advantages of an online booking system stated in chapter one such as time-saving, 24-hour Working service, access to service from anywhere in the world, check availability and instant collection of all guest payments (i.e. using your own merchant account/payment gateway) and much more will be achieved.

Furthermore, full implementation of this project will further improve the Nigerian cinema booking system, including in other areas of life where bookings or reservations are made, and could also increase the newly found love for movie watching in cinemas, while also helping to cut down cost of servicing extra manpower needed to run report sorting. Future work can be done in the aspect of using support vector machines to make predictions for users who can't decide what to watch.

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