International Journal of Emerging Engineering Research and Technology
Volume 2, Issue 7, October 2014, PP 76-81
ISSN 2349-4395 (Print) & ISSN 2349-4409 (Online)

Digital Table Booking and Food Ordering System Using Android Application

Prof V. B. Dhore, Surabhi Thakar[1], Prajakta Kulkarni[2], Rasika Thorat[3]

Department of Computer Engineering, RMD Sinhgad School of Engg, Pune, India
[1,2,3] Department of Computer Engineering, RMD Sinhgad School of Engg, Pune, India

Abstract: *With rapid increase in the use of mobile phones, the desire for people to access mobile internet to get information and services from anywhere and everywhere has increased. There is an increase in number of restaurants and restaurant-goers which necessitates enhancement of the hospitality industry. This research work aims to design and implement a remote food ordering system, through which one can order food before visiting a restaurant, book table, and also make payment. Moreover, two or more customers can place orders for the same table from remote locations. This application consists of three applications within itself. First is for the customer who can book tables and place orders. Second is for the kitchen unit in a restaurant, which enables the staff to view current orders. Third is for the manager of that restaurant in order to keep track of all the transactions. We have made use of a recommendation engine that suggests menu to a customer while placing order. We have also made use of a compression algorithm that compresses the size of images used throughout the application at various stages. This system increases quality and speed of service. It also increases the popularity of restaurants among potential customers. Implementing this system gives a cost-efficient opportunity to give customers a personalized service experience where they are in control of choosing what they want, when they want it – from dining to ordering to payment. We have chosen Android platform because it is most widely used today and is very economical.*

Keywords: *Recommendation engine, Android, Application, Compression algorithm, book table.*

1. Introduction

Over the years, technology has tremendously revolutionized the food industry. Traditionally, to dine at a restaurant, customer needs to directly interact with the waiter to place order. Further, customer needs to wait for a while to get the food served. However, today's era is witnessing people engaged in something or the other all the time. Customers are also demanding simplification of tasks in almost every field, from shopping to buying cars to booking movie tickets, cabs, etc. While dining at a restaurant, certain obvious inconveniences are faced by regular customers. These inconveniences include waiting, discrepancies in the order, incorrect bill generation and so on. Thus, a need to build an application to incorporate ease, accuracy and comfort is felt, when it comes to dining. In this research, we aim at designing and implementing a remote food ordering system and also improve customer's dining experience.

This application comprises of three different applications. The first application is implemented on customer's mobile device. Through this application, customer can search for restaurants based on a particular dish, vicinity, price, quality of food, or previous customers' reviews. After choosing a restaurant, customer can view a digital menu and select items by means of check boxes. After confirming the order, customer can proceed to payment. Customers can also book tables beforehand. With the help of an animated 3D-view, customer can view the arrangement of tables in a restaurant. This provides customers with a very interactive experience with the application. Customers are given the facility to register themselves. Upon registering, the customer gets to have a profile of his own, with the help of which customer can record his previous transactions, and also provide feedback in the form of rating, and also personalize his account. The application also provides Gamification. An additional feature that we have included in the customer's application is that two or more customers can place order from remote locations. There may be friends, colleagues, or family members at different locations who wish to dine together. In such a scenario, a group of people can remotely place their orders. Two or more people place orders concurrently and all these orders are merged to form one large order. The second application is used by the kitchen units of various restaurants. Kitchen staff can view details of current orders, closed orders and table numbers. When a customer completes payment to a particular restaurant, all the information is sent to the central database. From the central database, only that information that is of use to the kitchen staff of that particular restaurant is sent to the kitchen unit's device. With the help of these details, kitchen staff can proceed with their work. The third application is used by the managers of various restaurants. Manager is the person who controls every move in a restaurant. Manager is sent notifications when a customer places order and makes payment to a particular restaurant. Further, manager can update the arrangement of tables in his restaurant, if there has been a change. Manager can also update the menu, provided there have been any changes in the dishes, quantity, or prices.

We have made use of a recommendation algorithm that suggests dishes to the patrons based on previous orders. It makes it easier for the customer to build his/her order and also view trending dishes and/or offers. Moreover, various dimension filters can be used according to individual preferences e.g. price, taste, quantity, etc. Another algorithm that we have used is called the image compression algorithm. The home page of the customer application contains images of restaurants, dishes, etc. Images come in different sizes and to incorporate these into the screen of a mobile device, this algorithm is used. We have also used a priority algorithm that will help the manager decide which customer should be served first. In this application, we have used GPS service to enable the manager and kitchen staff of a restaurant to view customer's location. With the help of this, the amount of time in which customer will arrive at the restaurant can be determined and food can be served accordingly, such that waiting time can be avoided. Existing systems only allow customers to see restaurant addresses, contact numbers, their menu, and prices. There is no application in use today that enables customers to book tables of their choice, place prior orders, and also make payments. No application today supports order placing from remote locations and view of customer's current location with the help of GPS service.

2. PROPOSED SYSTEM

In current available applications, some form of static menu is utilized to convey the available food and beverage choices to customers. Said menus are generally photo based and hence impose restrictions on the textual real estate available and the ability a restaurateur has to update them. This application specifies the requirements for a restaurant digital menu and ordering replacement strategy to alleviate the problems associated with the current archaic method. Three related concepts are encompassed by the general scope of the Restaurant Menu and Ordering System. The first pertains to the replacement of photo menus using an electronic format, the second relates to a and the third surrounds the process of transferring said electronic orders to the kitchen for preparation. It should be noted that while the suggested strategy incorporates the use of various hardware components, the primary focus of the presented SRS relates to the constituent software elements. The following are the features which can be a part of the proposed system: Ordering, Waiting, Billing, Table Reservation, Home Delivery, KOT, and Advertisement.

3. SYSTEM SPECIFICATION

3.1. Table Booking

The application will allow user to book a table of his choice in advance. This will allow the customers to browse the animated view of the restaurant they wish and book a table.

3.2. Customer Feedback

Customer can enter the feedback about the service and the food served. This helps the Restaurant owner to analyze the service and make necessary changes if needed. This also helps the Customer's to decide a particular food item with a positive feedback. Searching

3.3. Click-n-Add Menu

Customer can search a particular food item according to name, price, category etc. The customer just has to click on food item and it will be added to his list. This saves a lot of time of customer to order an item.

3.4. Offers for Customer

The Restaurant owner can post various offers on tablet. This will help the customer as well as the restaurant owners.

3.5. Attractive Profile

There are images of every food item and restaurant location which will make the view of customers more clear about how the food will look like after delivery.

3.6. Time to Serve

The manager gets the approximate time customer will take to reach the restaurant. Food served as soon as customer arrives. Provides ease to customers.

3.7. Find Friends

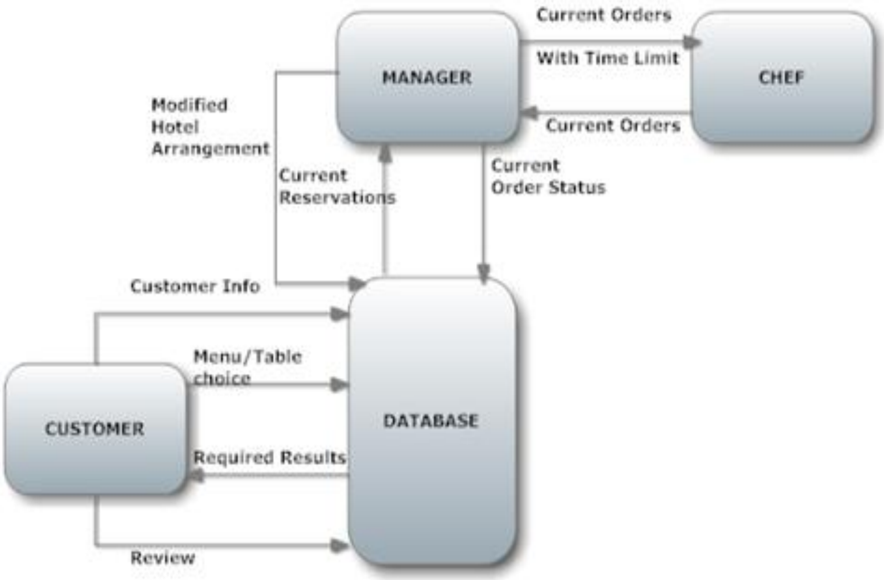
The application allows to search friends in the vicinity to accompany customers. This encourages interaction and business of restaurants.

3.8. Diet Count

The diet count, calorie intake, sugar intake is measured. A notification arrives for health conscious customers. Provides customer satisfaction.

4. SYSTEM ARCHITECTURE

The system architecture of Digital Table Booking and Food Ordering usin android is shown in figure 1[1].



The architecture covers the four main modules: the Customer or the Foodie, the Manager, the Aministrator and the Kitchen section. Conceptually this system is built using four main components:

- The android application on the smart phones.
- The server application on the restaurant-manager's laptop/tablet to customize keep track of customer records, table bookings and time required to reach.
- The central database for restaurant-owner to store updated menu information and order details.
- Wireless connectivity between the manager and the kitchen area of restaurant.

5. ALGORITHM

5.1. Dijkstra's –A Greedy Algorithm

Greedy algorithms use problem solving methods based on actions to see, if there's a better long term strategy. Dijkstra's algorithm uses the greedy approach to solve the single source shortest problem. It repeatedly selects from the unselected vertices, vertex v nearest to source s and declares the distance to be the actual shortest distance from s to v. The edges of v are then checked to see if their destination can be reached by v followed by the relevant outgoing edges.

5.2. Pseudo-Code of The Algorithm

The following pseudo-code gives a brief description of the working of the

Dijkstra's algorithm.

Procedure

Dijsktra(V: set of vertices 1... n {Vertex 1 is the source}

Adj[1…n] of adjacency lists;

EdgeCost(u, w): edge – cost functions;)

Var: sDist[1…n] of path costs from source (vertex 1); {sDist[j] will be equal to

the length of the shortest path to j}

Begin:

Initialize

{Create a virtual set Frontier to store i where sDist[i] is already fully solved}

Step1: Create empty Priority Queue New Frontier;

sDist[1]←0; {The distance to the source is zero}

Step2: **forall** vertices w in V – {1} **do** {no edges have been explored yet}

sDist[w]←∞

end for;

Step3: Fill New Frontier with vertices w in V organized by priorities sDist[w];

endInitialize;

Repeat

step4: v←DeleteMin{New Frontier}; {v is the new closest; sDist[v] is already correct}

step5: **forall** of the neighbors w in Adj[v] **do**

if sDist[w]>sDist[v] +EdgeCost(v,w) then

sDist[w]←sDist[v] +EdgeCost(v,w)

update w in New Frontier {with new priority sDist[w]}ZDSFAZDFxcv

end if

end for

Step6: **until** New Frontier is empty

End Dijkstra;

5.3. Proof of the Dijkstra's Algorithm

The proof of the algorithm can be obtained by using proof of contradiction. Before proceeding further with proof few facts/lemma have to be stated. · Shortest paths are composed of shortest paths. It is based on the fact that if there was a shorter path than any sub-path, then the shorter path should replace that sub-path to make the whole path shorter.

If s ->…-> u -> v is a shortest path from s to v, then after u is added to Frontier then sDist[v] = EdgeCost[s, v] and sDist[v] is not changed. It uses the fact that at all times sDist[v] >= EdgeCost[s, v]

The distance of the shortest path from s to u is sDist[s, u]. After computing, we get sDist[u] = EdgeCost[s, u] for all u. Once u is added to S, sDist[u] is not changed and should be EdgeCost[s, u].

6. CONCLUSION

Thus, we present an automated food ordering system with features of feedback and wireless communication. This system is convenient, effective and easy thereby improving the performance of restaurant's staff. It will also provide quality of service and customer satisfaction. Thus, the proposed system would attract customers and also adds to the efficiency of maintaining the restaurant's ordering and billing sections.

ACKNOWLEDGEMENTS

We are extremely happy to present this project on "". This project has been divided into different module so that the project can be understood properly the modules have been arranged in a proper sequence with eye-catchy GUI, to ensure smooth flow of the project.

The satisfaction and euphoria that accompany the successful completion of any task would be incomplete without mentioning the names of the people who made it possible, whose constant guidance and encouragement crowns all efforts with our success.

We extend our gratitude to **Dr. P.M. Patil** RMDSSOE, **Prof. D.N. Rewadkar** Head of Department, Computer Engineering for the encouragement and support that they have extended. We have made every possible effort to properly present the project on the proposed topic.

Finally, we also wish to thank all the guest faculties and non-teaching staff for supporting me during this work.

Prajakta Kulkarni(B81024229)

Surabhi Thakar(B81024251)

Rasika Thorat(B81024253)

REFERENCES

[1] Shweta Shashikant Tanpure, Priyanka R. Shidankar, Madhura M. Joshi, "Automated Food Ordering System with Real-Time Customer Feedback",in International Journal of Advanced Research in Computer Science and Software Engineering, Vol. 3, Issue 2, February 2013.

[2] Ashutosh Bhargave, Niranjan Jadhav, Apurva Joshi, Prachi Oke, Prof. Mr. S. R Lahane, "Digital Ordering System for Restaurant using Android", in International Journal of Scientific and Research Publications, Volume 3, Issue 4, April 2013.

[3] Soon Nyean Cheong, Wei Wing Chiew, Wen Jiun Yap,"Design and Development of Multi-Touchable E-Restaurant Management System" ,in 2010 International Conference on Science and Social Research (CSSR 2010), December 5 - 7, 2010, Kuala Lumpur, Malaysia.

[4] Jhabuawala Mustafa, Kothari Radhika, Naik Riddhi, Slatewala Abdulquadir,"Touch & Dine- A Multi-Touchable Restaurant System", in UACEE International Journal of Computer Science and its Applications - Volume 2: Issue 1.

[5] Swapna, M. Firdouse Ali Khan,"Design and Implementation of Ordering System for Restaurants", in International Journal of Engineering Research & Technology (IJERT), Vol. 1, Issue 10, December- 2012

[6] Khairunnisa K., Ayob J., Mohd. Helmy A.Wahab, M. Erdi Ayob, M. Izwan Ayob, M. Afif Ayob, "The Application of Wireless Food Ordering System", in MASAUM Journal of Computing, Volume 1 Issue 2, September 2009.

[7] "QOrder" The portable ordering system for Android devices.

[8] Cormac O'Connell, Restaurant Assignment.

[9] GHIRS: Integration of Hotel Management Systems by Web

AUTHORS' BIOGRAPHY

Prof V. B. Dhore is an Asst. Professor under Department of Computer Engineering. He is having 01+ years' experience in the field of teaching as well as research. His Research interests include domains like Distributed computing, Network security and Big Data.

Surabhi Thakar is a Student pursuing her B.E Degree under Department of Computer Engineering from University of Pune. She is currently involved in the application developing activities for developing algorithm for Application. Also she is actively working on the designing of the application.

She is actively working on the languages such as Java and Android.

Prajakta Kulkarni is a Student pursuing her B.E Degree under Department of Computer Engineering from University of Pune. She is presently working on Mathematical Module of the Application. Also, she is involved in the development of mathematical implementation of the sub algorithms involved in the Application.

Rasika Thorat is a Student pursuing her B.E Degree under Department of Computer Engineering from University of Pune. She is currently involved in the development of different Module Testing. She is also working on languages like Java and JavaScript.