Automation in Restaurants: Ordering to Robots in Restaurant via Smart Ordering System

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Abstract: Automation is everywhere; in one of our last paper we proposed a serving robot in restaurant to automate the restaurants. In that paper we discussed some issues in existing serving robots in China and Japan, and ordering to a robot is one from that issues. This paper is focusing on introducing ordering system along with robotic waiter in restaurants in India. It is a web based application that a customer can open on their smart phone. This system will help restaurants and hotels to increase their star rating and reduce the human error at the time of taking orders. Already hotels are doing new experiments to get notice by customers. For that they are registering in online applications also. Our application is basically for the robotic restaurants to automate them.

Keywords:Smart ordering system, Robotic Restaurant, KOT

1. INTRODUCTION

Imagine that you enter in a restaurant and there is not even a single person to attend you or come to take your order, only a single message on wall that to use their Wi-Fi to order and a robot will serve you. The biggest issue before introducing the robots in restaurants is to order food. Because to implement the vision of robots as a waiter, each and every single action to be performed, starting from entering in the restaurant should be human less. To resolve this we are proposing a smart food ordering web based application.

The automation in restaurants that we are proposing will bring technology in the restaurants. The traditional method of human waiter and menu on paper is very time consuming, where we have to wait for waiter to order. Whereas in robotic restaurants, with our application the customer just have to order via his or her mobile phone and do not need to wait for waiter. This replacement of robots in place of human will reduce the problems arise by human waiters and smart menu in place of paper menu card will support the go green theme. This app will directly interact in the kitchen part. The parameters that kitchen side require is the table number (from which the order came) and ordered food by the particular table. The system allow quick and easy managing an online menu which customers can browse and use to place orders with just few clicks.

For placing any orders customers have to visit robotic hotels or restaurants. They can order through their own phone or from the tab (already there on the table).

This paper is focusing on smart ordering system to be introduced in restaurants along with serving robots.

II. MOTIVATION

China and Japan are continually doing inventions in robotic sectors; even they are using robots in every field to facilitate the public. Our aim is to make our Nation more powerful in terms of technology. Already number of research had done to automate the industries of India. Our contribution is to make the restaurants and hotels automated and facilitate the public by robotic technology along with the smart ordering system.

III. BLOCK DIAGRAM OF BASIC SMART ORDERING SYSTEM

Here is the block diagram of smart ordering system, where customer can access the web ordering system and that order will retrieve by the restaurant employee. This is the basic operation of smart ordering system, further the order will be serve by Robot to the desired table.
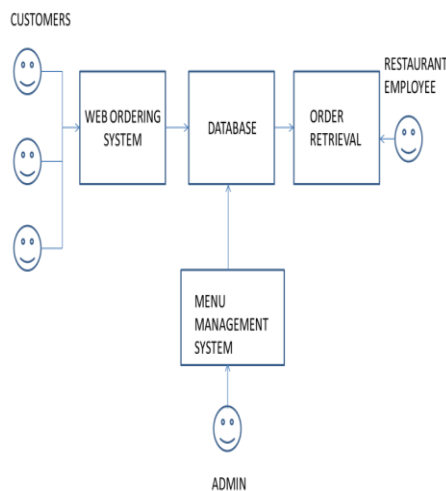
Figure 1: Block Diagram of Smart Ordering System

The smart ordering system can be divided into 3 main components:

- Web Ordering System- Customers can place their order via their smart phone.
- Menu Management System- The menu management will be authorized by the authorized person from restaurant. In this they can manage their menu and can hide/delete/add the required item.
- Order Retrieval System- In this system, restaurant employee will keep track on each and every order receive/serve.

IV. BENEFITS OF THIS PROJECT

4.1. Easy for customer: Our proposed system will bring convenience for customer as they do not have to wait for waiter to come and take their order. They can just enter the dining room and will order directly by their smart phones and later a robot will facilitate them by serving delicious meal.

4.2. Robotic waiters are beneficial for restaurant: There are some human errors that can degrade the rating of restaurant also asking for leave by waiter will bring the worked up condition in restaurant. By our proposed robotic services with smart ordering system will overcome with these kinds of human issues. Restaurant owner have to purchase the robots once and can use their services lifetime 24x7 without even paying them.

4.3. Serving food according to the food ordering queue: This is the major issue that always can happen in restaurants is to not prepare food as per queue. Sometimes customer has to wait and another one who came late can serve early. This happen because by traditional method of writing order on paper slip brings difficulty for cook to maintain the queue. With smart ordering system this issue will get resolve. All the orders done by customer will directly flash on the screen at kitchen side in a queue, and after serving the food the cook can click the order "serve" to eliminate it from the screen.

V. . LITERATURE REVIEW

Mayurkumarpatel [1] had proposed the online food order system that is fulfilling the basic need to order food in a restaurant. His aim is to make the ordering easy for both customers and waiters.

VarshaChavanet. al. [2] had discussed the "Food Pre-Order System using Web Based Application". They want to eliminate the process of taking order on paper slip and reduce the confusion arise due to human error. They basically propose smart phone ordering by mobile phones instead of PDAs.

Sainath Reddy Ket. al. [3] discussed ordering food online along with real time feedback. Their main aim is to make work easy of restaurant's employees and increase their performance.

Neeti Malik et. al. [4] explains the serving robots. The ordering system used in this paper is the LCD module. This module is programmed by embedded C and connected wirelessly to the counter.

Adithya R. et. al. [5] proposed the automated food ordering system. His aim is same as the early authors have that to minimize the confusion in traditional method of taking order and increase the efficiency and popularity of restaurants.

This paper [6] contains the proposal of a fully automated menu ordering system in which the paper based menu is replaced by a user friendly Touchscreen based menu card. The system has PIC microcontroller which is interfaced with the input and output modules. The input module is the touchscreen sensor which is placed on GLCD (Graphical Liquid Crystal Display) to have a graphic image display, which takes the input from the user and provides the

same information to the microcontroller. The output module is a Zigbee module which is used for communication between system at the table and system for receiving section. Microcontroller also displays the menu items on the GLCD. At the receiving end the selected items will be displayed on the LCD and by using the conveyer belt the received order will send to the particular table.

Shiny.J.S. et. al. [7] discussed about automation of restaurants by providing ordering using keypad and LCD display.

VI. FUNCTIONS OF ORDERING SYSTEM

6.1. Smart Menu System: The following screen shots are of smart menu system. This page will open via accessing local Wi-Fi of restaurant. Customer can order the desired dishes and view them in the cart. After clicking on the button of "order now", it directly flashes on the screen of kitchen side.

Here customer can order his/her desired dishes till asking for bill. The bill will then receive by message to customer.
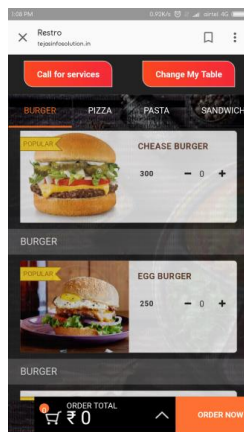

Figure 2: Smart Menu

6.2. Asking for Services: There are two services provided to customer:

- Call for service
- Change table

During taking meal if customer need any kind of services, they can click on "call for service" button.

And if they want to change the table after occupying the seat, they can send the request by clicking the "Change table" button.
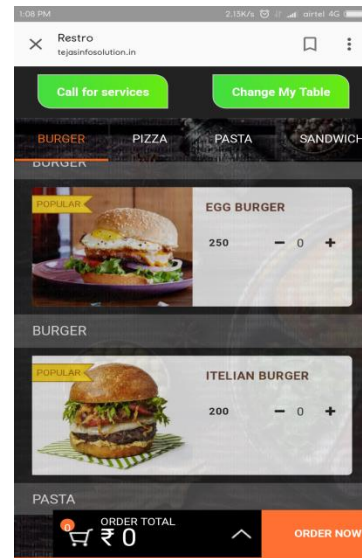

Figure 3: Smart Services

6.3. Menu Management System:

Admin can manage the menu that is available in restaurant, and can update the "today's special" menu.

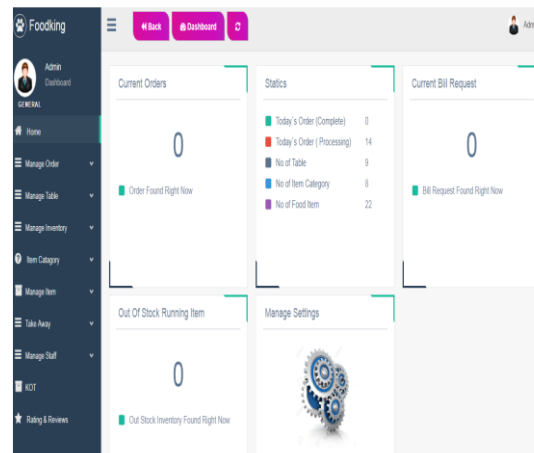Admin have the authority to change/hide/delete the dish as per availability.

Figure 4: Admin Management Window

6.4. KOT: This is one of the most important part of ordering system. The ordered menu by customer will directly visible on the screen of kitchen side. The new order will arrive on screen with sound along with the table number. After completing the preparation and serving the order, cook then click on the "serve" button. This will delete that table from the screen and will make the task of cook very easy.
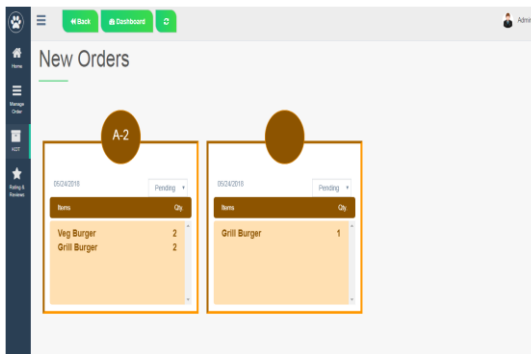

Figure 5: Kitchen Side Window

VII. HEART OF THIS SYSTEM

This system is incomplete without robotic waiter. The order will then serve by Robots to the desired table. This complete system of making restaurants automated will brings new experience for the public of India.

VIII. CONCLUSION & FUTURE WORK

Robots are not new now, and this is the time to accept new technology that will serve public in social areas also. We choose restaurant, because this is the place where public not only come to chill with friends or family but also to attend official meetings as well. The smart ordering system will give wonderful experience in restaurants.

The main objective of smart ordering system is to make the complete restaurant automated.

In future work we can call the robots for room service also. For that we will amend our application with options of room service also.

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