Intelligent E-Restaurant using Android OS

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Abstract: The simplicity and ease of access of a menu are the main things that facilitate ordering food in a restaurant. A Tablet menu completely revolutionizes the patron’s dining experience. Existing programs provide an app that restaurants can use to feed their menus into iOS & Android based tablets and make it easier for the diners to flip, swipe & tap through the menu. We here aim to provide the restaurants with a tablet menu that would recommend dishes based on a recommendation algorithm which has not been implemented elsewhere. In addition to this we run the app on an Android based tablet & not on an iOS based tablet which is more expensive alternative. We use a cloud-based server for storing the database which makes it inexpensive & secure.

Keywords: Bluetooth, PC, Mobile Device.

I. INTRODUCTION

Over the years, technology has tremendously revolutionized the restaurant industry. But much of the innovation has been with point-of-sale (POS) operations. Yet other areas of a restaurant are ripe for innovation, such as the menu. Traditional restaurant service requires waiters to interact with customers directly before processing their orders. However, a high-quality recommendation service system would actively identify customers and their favorite meals and expenditure records. The restaurant menu has evolved from its humble beginnings on carte chalkboards and imageless print to today’s detailed, colorful displays. With the emergence of digital tablets and user-friendly touch screen technology menus can move to a Whole new surface. With this electronic menu, orders can be taken correctly the first time. There is no need to run back and forth to a distant terminal, because the terminal is always with the server. Every order is associated with an individual seat at the table, and orders are built one customer at a time, just like on paper, but with greater accuracy. Items can also easily be shared by the whole table, moved or modified, and noted and the cost can be calculated in real time.

The Recommendation algorithm suggests dishes to the patrons based on previous orders. It makes it easier for the customer to build his/her order and also view the most popular dishes. Moreover, various dimension filters can be used according to individual preferences e.g. Price, taste, quantity, etc. There are several restaurants in Mumbai which have replaced the traditional paper menus with the digitized tablet menu. But none of the apps let the patron place an order directly to the kitchen. The tablet’s use is restricted to simple viewing of the menu.

II. THE HARDWARE SYSTEM

Micro controller: This section forms the control unit of the whole project. This section basically consists of a Microcontroller with its associated circuitry like Crystal with capacitors, Reset circuitry, Pull up resistors (if needed) and so on. The Microcontroller forms the heart of the project because it controls the devices being interfaced and communicates with the devices according to the program being written.

S3C2440A: S3C2440A 16/32-bit RISC microprocessor. SAMSUNG’s S3C2440A is designed to provide hand-held devices and general applications with low-power, and high-performance microcontroller solution in small die size. To reduce total system cost, the S3C2440A includes the following components. The S3C2440A is developed with ARM920T core, 0.13um CMOS standard cells and a memory complier. Its low power, simple, elegant and fully static design is particularly suitable for cost- and power-sensitive applications. It adopts a new bus architecture known as Advanced Micro controller Bus Architecture (AMBA). The S3C2440A offers outstanding features with its CPU core, a 16/32-bit ARM920T RISC processor designed by Advanced RISC Machines, Ltd.

Liquid-crystal display (LCD) is a flat panel display, electronic visual display that uses the light modulation properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images or
fixed images which can be displayed or hidden, such as preset words, digits, and 7-segment displays as in a digital clock. They use the same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements.

III. DESIGN OF PROPOSED HARDWARE SYSTEM

![Fig.1.Block diagram.](image)

![Fig.2. Mobile diagram.](image)

The design of entire system consisted of two part which are hardware and software. The hardware is designed by the rules of embedded system, and the steps of software consisted of three parts. The existing method by improving the security level by implantation of ETHERNET that will solve this problem. WIFI based wireless technology which consists of transmitter at the site location and receiver at control panel. Information received at the receiver will be send to the ETHERNET. So the people living at home with internet connection can see the received data. The system uses a compact circuitry built around LPC2148 (ARM7) microcontroller Programs are developed in Embedded C. Flash magic is used for loading programs into Microcontroller as shown in Figs.1 and 2.

IV. BOARD HARDWARE RESOURCES FEATURES

**Bluetooth:** AUBTM-22 is a Bluetooth v1.2 module with SPP profiles. The module is intended to be integrated into another HOST system which requires Bluetooth functions. The HOST system could send commands to AUBTM-22 through a UART. AUBTM-22 will parse the commands and execute proper functions, e.g. set the maximum transmit power, change the name of the module. And next the module can transmit the data receive from the uart with SPP profiles. The purpose of this document is to define the protocol between the HOST system and AUBTM-22 through the UART connection. The protocol heavily depends on the AT commands of 3GPP 27.007[1] and 27.005 GSM[1] recommendations. Most of the commands are the same with the GSM standard, with several special commands defined by AUSTAR technology.

- Radio transceiver supports spectrum spreading and operates at a frequency between 2.402 GHz - 2.480 GHz ISM band.
- Spectrum spreading is accomplished by frequency hopping in 79 hops displaced by 1MHz. (maximum of 1600 hops/sec.)
- Each device can optionally vary its transmitted antenna power.

**PC:** Keyboards on an OEM basis to leading global PC manufacturers for use in desktop and notebook PCs and also supplies for retail keyboard OEMs.

**Features:**

- Internal Sourcing of almost all of main Parts: Almost all components - frame, key switches and membrane sheet - other than connecters and cord are manufactured in-house, giving Minebea an un-matched advantage in terms of quality, supply capabilities, cost-competitiveness and speed of delivery. Especially, these products capitalize on Minebea's ultra-precision machining technology of components.
- Efficient Production System: Plant in China which supplies the global market employs the Minebea's vertically integrated manufacturing system, whereby all process, from machining components to final assembly are conducted in-house.

V. CONCLUSION

Most, if not all, of the current tablet based menu systems use Apple’s iPad device. This is mostly due to the fact that the current generation of iPads were the first tablet devices to feature high resolution displays and the perceived brand recognition and status of the brand that is Apple. It is a well-known fact that Apple devices sell at a premium. So, if an establishment were to implement this system, they would unfortunately have to pass on the extra costs to their customers that they incurred in the procurement of these devices. High resolution Android tablets are now available at extremely economical rates with varying feature sets. Since all our application needs is a Wi-Fi connection and good display, the costs of the tablet devices can be kept to a minimum. The centralized servers can allow the sharing of customer data between restaurants, if allowed to do so explicitly by both the customer and the business, and then this can help in providing better recommendations and user experience to the patrons. This is really not possible in the stand
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alone systems that currently exist. A high-quality service system should be customer-centric, i.e., it should immediately recognize the identities, favorite meals and expenditure records of customers so as to provide Customer-centric services. Therefore, using advanced technologies to improve service quality has attracted much attention in recent years.

In recent years, various product recommendation systems have been developed to enhance customer satisfaction and perceived value. Defined as a system which recommends an appropriate product or service after learning the customers’ preferences and desires, recommendation systems are powerful tools that allow companies to present personalized offers to their customers. Extracting users’ preferences through their buying behaviors and histories of purchased products is the most important element of such a system. The mobile device-based service unit enables instant transmission of customer orders via Internet to the kitchen for meal preparation. In addition, the expenditure information can be sent to the cashier for bill pre-processing. The restaurant managers can access the database to evaluate the business status anytime and make appropriate redeployments for food materials. Notably, all ordering and expenditure information is digitized for database storage, which allows restaurant owners to consider discounts or promotion to customers based on expenditure statistics. Customers can thus appreciate high-quality service, which in turn highly promotes enterprise image and increases business revenue for the restaurant.

VI. REFERENCES