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Wireless Two-way Restaurant Ordering System via Touch Screen

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----------**ABSTRACT**----------
This project presents a restaurant management in efficient way, and to reduce manpower. The whole ordering via touch screen. Furthermore, a push button on the cook room for giving acknowledgment to the customer table for indicating that the order is placed. We design and accomplish a new embedded handheld wireless two-way restaurant ordering system based on ARM cortex-M3.

Keywords: *Restaurant management; ARM cortex-M3; Push button; Touch screen*

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I. INTRODUCTION

At present, information and communication technology has been brought to a number of businesses in order to make the operation more convenient or add to their values. Restaurant management can be more efficient with the help of technology. Both the owner and the customer will find it more convenient and hence values will be added from the good impression and the efficient administration and management of the entrepreneurs.

As living standards improved, people are not only satisfied eating diet good or bad, but also very focused dining environment. In addition, the management of traditional food and beverage industry is in relatively low level, all the operations basically carried out by hand, the waiter rush about leaflets, high labour-intensive, low efficiency, and high error probability. For the vast majority of catering industry, catering information management only stays in the "computer account in mind, playing list" extent. Many business data cannot be made full use of by manager, and relying on human to extract useful information from the business artificial data is a very difficulty. As market competition intensifies, many restaurants began to use information technology to change the service models and business models. On this basis, the wireless ordering system came with the tide of fashion.

II. LITERATURE REVIEW

A) Pixel Point

PAR Pixel Point Company uses this software for managing the restaurant. The system consists of the company's software and hardware. This network system is compatible to TCP/IP, enabling information sending through both wireless and conventional networks [1].

B) LRS Restaurant Server Pager Starter Kit

This system improves the food-ordering service quality in restaurants and reduces the waiting time of clients. The on-site paging system is used at UHF frequency or the frequency range of 467 MHz for sending the order data [2].

C) Billpro Pocket® and Billpro POS for Restaurant

This system receives a client's order and makes a list by means of the designed client's template in the kitchen. The food ordering device is portable. The waiter takes the client's order and sends it to the client's template in the cook room [3].

D) Restaurant System by Ericsoft

This program administers and manages general restaurant services wirelessly. Food ordering is taken by waiters who then order the cashier, who in turn tells the cook room what to cook [4].

E) Implementation of Network-based Smart Order System

The Smart Order System in Restaurants (SOSIR) has been modified to take order from the client's table Through RS-232 signal, this is sent to the cashier counter. The cashier counter system is connected to a database. When the clients' orders are sent the cashier counter system will screen and prioritize the orders Before sending the information to the kitchen for the chef to cook [5].

Table 1: Compare features

	PixelPoint	LRS	Ericsoft	Smart Order System	*Wireless Two-way Ordering System*
Wireless Network	Yes	Yes	Yes	No	*Yes*
Touch Screen	Yes	No	Yes	No	*Yes*
Easy Call Waiter	No	No	No	No	*Yes*
E-menu	No	No	No	Yes	*Yes*
Status of ordering	No	No	No	No	*Yes*
Group orders	No	No	No	Yes	*Yes*
Prioritize customers	No	No	No	No	*Yes*

Table 1 shows the comparison of functions of each system. In general, most systems are already based on wireless network and touch screen. However, the disadvantages include the missing of an efficient waiter calling system and checking of order status in order to lessen customers' anxiety.

III. SYSTEM DESIGN

By gathering each benefit from various previous works, this paper aims to implement a restaurant ordering system which enables each customer to wirelessly order his own choice of food straight from the e-menu shown on an embedded touch screen on each customer table without bothering any staff and send the order straight to the cook room. The whole food process can also be monitored via this touch screen.

The existing system, the design implementation using ARM9 s3c2410.The performance which is 3 times lesser when compared with cotex-M3 .In the case of multiple interrupt, the response time is quite higher. It is not configurable. Typically 220 MIPS @200MHZ.

The proposed system consists of three main components, namely, a touch screen embedded on the customer table, a main server and another touch screen in the cook room, shown in Figure 1. When the customer orders food, the data is sent to the server, which will compile the data in order to prioritize the customers and to group the orders before sending the order to the cook room. The status shown at the client's table is 'waiting for food'.

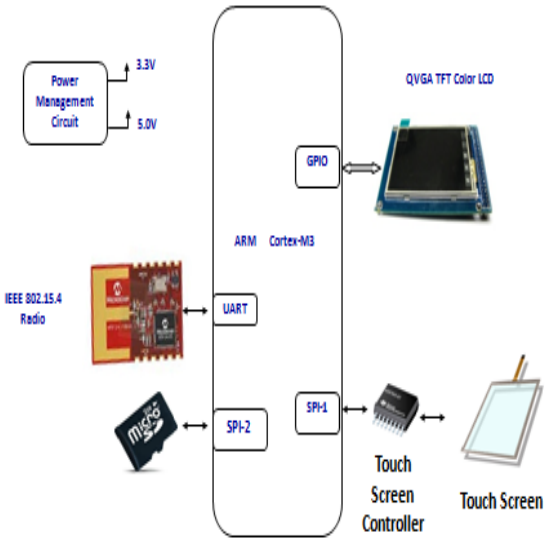

Figure 1: Block of Table Mode

When the order reaches the cook room, the chef will press the 'accept' button which will show the cooking stage at the client's table. When cooking is done, the chef presses the 'waiting for serving' stage to the client's table and the server will take the dish to the client.

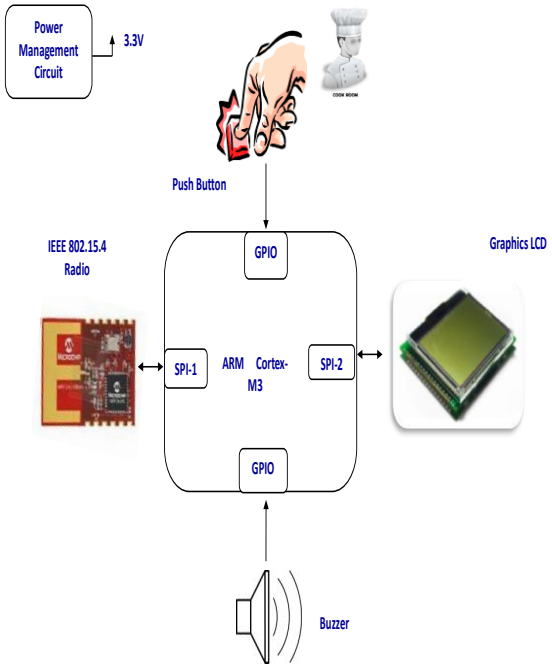

Figure 1: Block of Kitchen Mode

This food ordering system is capable of informing the food status when the menu has been ordered via wireless touch screen communication network. The touch screen is the system's input-output device. Besides, waiters can be called using the table device by pressing the **"Call Waiter"** button, which will immediately activate the buzzer.

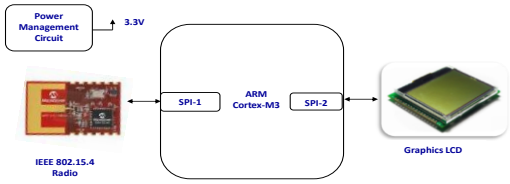

Figure 3: Block of Billing Mode

Database comprises 2 major components. The first
Is the food table which is used to store menus including dish names and prices, the date this dish was added, types and additional information. **(Figure: 3)**

IV. EXPERIMENTS AND RESULT

- When the 'menu' button is pressed, the menu Will appear on the touch screen as in **Figure1**.
- Send the food orders to the kitchen.
- Receive notification from the kitchen **Figure2**
- Waiters can be called using the table device by pressing the **"Call Waiter"** button, which will immediately activate the buzzer.
- know the total price that the customer in certain table must pay **Figure3.**
-

Figure 4: **Hardware design**

V. CONCLUSIONS AND FUTURE WORK

This paper presents a wireless two-way restaurant Ordering system which gathers a number of advantages of existing works and work via touch screens at three different units: customer tables, cook room and main server. However, the operation based on **"Any Client By One Server Respond"** is questionable because the next client has to wait until the client being serviced is taken care of before he can connect to the server. One way to solve this problem is to use the **Thread Server Respond** as shown in Figure 5.

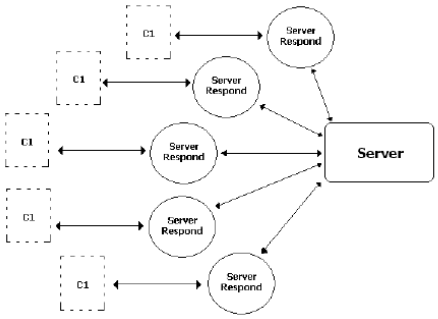

Figure 4: One Client One Server Respond

The three order statuses are also difficult to understand because when the status shows that the order is 'waiting to be served' and the assistant already takes the food to the client, the status still shows 'waiting to be served'. Thus, we should add the status, 'already served' for ease of understanding.

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