EXECUTIVE RESTAURANT ORDER SYSTEM

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ABSTRACT

Nowadays, in Information Technology era, users need higher and faster system or application. Time is a highest priority in their life. Faster applications or systems with high response time are the criteria are mostly being look at. Daily activities such as money transaction from bank and purchasing products are commonly activities done by users. This is included with taking order in restaurants. Current system could not fulfill the requirements of customer especially when peak conditions. For example current system could not arrange the customer's order properly, wasting time, and need more staff to handle the customers. This will make trouble to the customers and also to restaurants management. Therefore the EROS or Executive Restaurant Order System is the best way to prevent this problem. The EROS system includes the application of taking order system by waiter or waitress using PDA. After that the order will be sent to the kitchen and cashier by using Wireless Local Area Network (WLAN). On the kitchen's section, the order will be displayed on the screen. For customer's reference, the EROS system provides the receipt. This receipt is available in Cashier application. The EROS system was developed by using Microsoft Visual Studio .Net 2003 software. This is because this language includes all programming in building in the EROS system. The system also used wireless technology to give the freedom to waiter or waitress to take the order.

ABSTRAK

Dalam dunia yang serba moden ini, pengguna memerlukan suatu sistem atau aplikasi yang canggih dan laju. Pengguna amat mementingkan masa dalam semua aktiviti harian yang dilakukan oleh mereka. Sistem atau aplikasi yang pantas adalah kriteria yang amat dititikberatkan dan diberikan keutamaan yang paling tinggi. Antara aktiviti harian yang dilakukan oleh pengguna adalah pengeluaran duit dari bank dan pembelian barang. Ini termasuklah dalam pengambilan pesanan makanan ketika berada dalam restoran. Sistem yang ada sekarang tidak dapat memenuhi permintaan pengguna yang inginkan sesuatu yang pantas. Tambahan pula sistem sekarang tidak dapat menguruskan pesanan pelanggan dengan baik, ia juga banyak membazirkan masa dan memerlukan pekerja untuk melayan pelanggan. Ini menjadi masalah kepada pengguna terutama ketika keadaan memuncak. Oleh yang demikian, sistem EROS atau "Executive Restaurant Order System" dibangunkan untuk mengatasi masalah ini. Sistem EROS ini merangkumi aplikasi pesanan yang dimulai dengan pelayan restoran mangambil menu dari pelanggan dengan menggunakan PDA. Kemudian pesanan tersebut akan dihantar melalui teknologi tanpa wayar ke bahagian dapur dan jurujual. Pada bahagian dapur, tukang masak akan menerima pesanan melalui paparan skrin. Sebagai rujukan kepada pelanggan, sistem EROS ada menyediakan resit melalui jurujual. Sistem EROS ini dibangunkan dengan menggunakan perisian Microsoft Visual Studio .Net. Ini adalah kerana bahasa ini meliputi segala pengkodan yang diperlukan dalam membangunkan sistem EROS ini. Disamping itu, sistem ini juga menggunakan teknologi tanpa wayar bagi memudahkan pelayan untuk mengambil pesanan makanan.

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Database	Database refers to a file that is used to store information in a format that is easily retrieved and manipulated. The most common database files are made up of tables, fields and records. These are referred to as a relational database.
Ethernet	A local-area network (LAN) architecture developed by Xerox Corporation in cooperation with DEC and Intel in 1976. Ethernet uses a bus or star topology and supports data transfer rates of 10 Mbps. The Ethernet specification served as the basis for the IEEE 802.3 standard, which specifies the physical and lower software layers. Ethernet uses the CSMA/CD access method to handle simultaneous demands. It is one of the most widely implemented LAN standards. A newer version of Ethernet, called 100Base-T (or Fast Ethernet), supports data transfer rates of 100 Mbps. And the newest version, Gigabit Ethernet supports data rates of 1 gigabit (1,000 megabits) per second.
ISO	Internationals Standards Organization. A worldwide organization that defines and develops standards on a variety of topics.
HDLC	High-level data link control. A bit oriented data link protocol defined by the ISO. It is base on for many data link protocols used in LANs.
MAC Address	The address of a device used at the data link layer.

PDA	Any small mobile hand-held device that provides computing and information storage and retrieval capabilities for personal or business use, often for keeping schedule calendars and address book information handy.
Wi-Fi	The term Wi-Fi refers a group of industry standards for wireless communication including 802.11b and 802.11g.
WLAN	The WLAN supports network communication over short distances using radio or infrared signals instead of traditional network cabling. WLANs often extend an existing wired local area network.

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CHAPTER 1

INTRODUCTION

1.1 Project Overview

Executive Restaurant Order System (EROS) is a new technology for taking order from customer. All information about customer's order will take by the waiter or waitress by using PDA and sent it into database. Then the order will be retrieved by cashier and chef. The management of the restaurant can be improved when using this system compared to the traditional method.

The EROS system contained three modules or applications. All these application were connected to the database. These there applications are:

i. PDA Application
ii. Cashier Application
iii. Kitchen Application

The PDA application is for take the order from customer. The entire customer's order will be entered from this application. The waiter or waitress were used PDA as input device to get the order from customers.

In Cashier application, the application will retrieve the customer's order from database. Then it will calculate the total prices of the order that needs to pay by customers. It also will produce the receipt to allow the waiter or waitress to give it to customers as their references. The waiter or waitress need to printout the receipt after customer pay their bill.

The Kitchen application in the kitchen will replace the use of handwritten tickets from a waiter or waitress, which offers the chef an easier to read the customer's order. The Kitchen application is used for the chef inside the kitchen to receive their cooking order. By using monitor, it can reduce the paper usage. Moreover it can make the kitchen more efficient and manageable.

1.2 Problem Statement

Today, the world has been changes. There are so many technologies that are found to make easy for human life. These are including the e-management system, e-bank system, e-commerce system and many more. The governments also said that the Malaysia is aiming to vision 2020 and now try to achieve as developed nation. Unfortunately there some system not upgrade with a new technology. One of them was taking order system in restaurants. Most of the restaurants in Malaysia are still using traditional method which using pen and paper. This system has lots of scarcities. These include:

i. Traditional method makes management of the restaurants was not organized well.
ii. By using paper, the order can be missed or not arranged according the priority of first come first serve.
iii. Wasting time to take the order. The waiter or waitress need to take the order and bring it to the kitchen and cashier for every single table.

iv. The owner of restaurants need more staff to handle customers.

1.3 Objective

The EROS system that is going to be developed has its own objectives. The objectives of the system development are:

i. To develop prototype of taking order system by using PDA simulation.
ii. To display the order in the kitchen
iii. To calculate the total prices of order and printout the receipt.

1.4 Scope

The EROS system will be developed according to the several scopes. The scopes include:

i. The PDA application operates in Wireless Local Area Network (WLAN) while Kitchen and Cashier application operates in Local Area Network (LAN).
ii. The PDA running in simulation.
iii. The system handles from entry of an order by a waiter or waitress and receives the order by chef and cashier.
iv. Database is using Microsoft SQL Server 2000. This database is act as the temporary stored data. After customer paid their bill, the information of the customer's order will be deleted automatically.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The taking order system has been widely used in many countries in the world. There are so many companies tried to race each other o develop this system. This software has developed and was selling to the restaurants that need t use this system. But in Malaysia it is not widely used. This is because the system need higher cost to develop. Therefore this system is implemented for high class restaurants for example PixelPoint200, Restaurant Pro Express, and Order Buddy.

In this chapter will covered the research on existing restaurant taking order systems, the hardware and software that will be going used and also the communication media which LAN and WLAN.

2.2 Existing Restaurant Taking Order Systems

There is lots of software in current market. This software has its own advantage and disadvantages. The pros and cons depending on the suitable with the restaurant and the owner of restaurants.

2.2.1 DynerTec

The DynerTec is a revolutionary restaurant management system that provides managers with several tools to improve service to their customers. The features of this system are:

i. Using handheld computers, the wait staff can enter orders into the DynerTec system from any table in the restaurant.
ii. Credit Card transactions take place in front of customers and in real time.
iii. The wait staff has more time to interact with customers.
iv. Managers can communicate with the wait staff via a wireless messaging system.

There are two major components which are the Front end and the Back end. Both of these components are working together. They act as one. The front end consists of either wireless handheld computers or a touch screen. Otherwise back end consists of a Dell server, Management Console, powerful Microsoft SQL database engine, and the DynerTec Middleware software.

Together the Front end and the Back end perform wireless transactions and wireless information exchange. The system enables the servers, kitchen, bar, and management to communicate via wireless Ethernet, thereby streamlining the food and beverage service within the establishment. The software performs many functions such as:

i. 20 guests per table
ii. 20 line items per guest
iii. Multiple modifiers per line item
iv. Discounts are a management utility

v. Ability to split checks
vi. Ability to split checks into multiple payment types
vii. Ability to include gratuity
viii. Ability to reprint checks
ix. Credit card processing on the handheld
x. Ability to reopen checks
xi. Table review feature
xii. Ability to view a description of an item
xiii. Ability to copy line item from one guest to another
xiv. Ability to repeat line item
xv. Ability to hold a line item
xvi. Ability to transfer tables from one server to another.

2.2.2 Restaurant Pro Express

Another example of software for restaurant taking order system purpose is Restaurant Pro Express. Restaurant Pro Express is a Touch Screen Point of Sale (POS) system designed for easy order taking, integrated customer loyalty, efficient order processing with kitchen printing and bulletproof security. The result is less training time, more repeat business, accurate accounting and more profit (Raco, 2004).

This system also increase restaurant's profits by reducing theft and shrinkage, track employee time, track inventory, identify slow or non moving menu items, automatically send orders to the cook, and receive up to the minute sales reports, nightly or daily totals (Raco, 2004). Due to this features, the system make the restaurant management more efficiency, manageability and security.

The Restaurant Pro Express also provides the clear receipt to the customer beside the owner receive a clear understanding of the sale. Each customer receives accurate

information on the receipt. Both owner and the customer get benefit from restaurant management system. The old restaurant register performed only one duty. The restaurant POS system allows all employees to work as a team and achieve greater profit overall and customer service.

Restaurant Pro Express point of sale is helps Restaurant management, with built-in interfaces for table service, quick service, take out, delivery, and all other types of food service. Kitchen printing, gift cards, multi-restaurant utilities and hundreds of other features are all built into one affordable package. There are two type of Restaurant Pro Express. There are:

i. Restaurant Pro Express
ii. Restaurant Express Lite

Table 2.1: The criteria of Restaurants Pro Express and Restaurant Express Lite

Restaurant Pro Express	**Restaurant Express Lite**
▪ Saves customer data ▪ Designed for Touch Screen Invoicing ▪ Customizable Touch Screen ▪ Separate Department and Item Selection ▪ Modifier Items Prompting ▪ Line Discount Option ▪ Passwords on Voided or Discounted Sales ▪ Exportable Report Information ▪ Unlimited Department, Item and Modifier Content ▪ User Definable Menus ▪ Handles Unlimited Multiple Remote Printers ▪ Kitchen Order Printing ▪ Detailed Customer History ▪ Detailed Sales History	▪ Saves no customer data ▪ Pizza Restaurant ▪ Special Orders ▪ On Screen Keyboard for Special Instructions ▪ Bulletproof on the Network ▪ User Definable Hotkeys ▪ User Definable Touch Screen ▪ Daily Specials (i.e. Happy Hour Specials) ▪ Order Filling Screen for Kitchen Monitor ▪ Station Specific Settings ▪ Employee Card Swipe Support ▪ Automatic Gratuity ▪ Party Size Prompting ▪ Customer Loyalty Features ▪ Individual Order Tracking (tracks what each customer orders) ▪ Order Status Prompting

Table 2.1: The criteria of Restaurants Pro Express and Restaurant Express Lite (continue)

Restaurant Pro Express	Restaurant Express Lite
▪ Stores Old Invoices ▪ Puts Invoices on Hold ▪ Purchase Orders ▪ Detailed Order History ▪ Ability to Recall Reports from Any Given Day ▪ Easy Printer Management ▪ Vendor Tracking ▪ Create Hotkeys ▪ Inventory Control ▪ Food Cost and Use Reporting ▪ Tracks House Accounts ▪ Multilevel Password Protection ▪ Prints Reports to Screen, Printer ▪ Detailed Profitability Reports ▪ Online Credit Card Processing ▪ Adds Multiple Modifiers ▪ Microsoft Access Compatible ▪ Table Layout for Quick Table selection ▪ Table Diagram - Design where tables are located ▪ Automatic Server and Table Number Prompting ▪ Dining Room Table Management ▪ Quick Table selection prompting ▪ User Definable remote printing ▪ Customer Tabs ▪ Splitting checks ▪ Multiple Credit Cards on One Receipt ▪ Table and Server Swapping	▪ Online Credit Card Processing in 2-5 seconds ▪ Attractive Receipt Printing ▪ Phone Order Processing ▪ Invoice Notes for Delivery ▪ Directions ▪ Fast Customer Entry ▪ Order Filling Station ▪ To-Go Order Status settings ▪ Store Unlimited Customers ▪ Add Customers from any station ▪ Easy Lookup by customer number or name ▪ User Definable Hotkeys ▪ Print Extra Order to printer ▪ Customer Loyalty Features ▪ Coupons on the receipts ▪ Fixed Item Hotkeys ▪ Customer Notes ▪ Password Protection ▪ Employee Swipe Cards ▪ Works with Weight Scales ▪ Programmable Keypad Ready ▪ Prints To Stay, To Go or Delivery on remote printer ▪ Easy Invoice on Hold ▪ Support Multiple Stations ▪ Customizable and colorful touch screen ▪ Supports pictures in buttons

2.2.3 DinerMO

DinerMO is developed by trained professionals with backgrounds in a wide variety of related fields (Total Computers, 2004), the fully Integra table DinerMO Point of Sale software is the single source solution that can bring expert efficiency to your business, it features:

i. Flexible Configuration

DinerMo POS software can be configured to suit every restaurant need, including:

a. Table Service
b. Quick service restaurant
c. Casual of fine dining
d. Delivery/dispatch
e. Bar/night club service

ii. Multi-Service Management

To ensure management proficiency, DinerMO POS can maintain a wide range of functions, including:

a. Handheld wireless waiter application.
b. Interface with EFTPOS.
c. Item scanning.

Additionally, this software allows users to manage problematic aspects of the business that frustrate head office, the employees and customers alike.

iii. Multi-Service Interfaces

Offering a variety of additional interfaces in the standard package, the DinerMO POS software solution is adaptable to an extensive range of add-on elements, such as:

a. A kitchen monitor to maximize order efficiency.
b. A bar control system interfaces to maintain exact liquor inventory. These special features mean less hassle for users

across the board; now, restaurants o longer have to worry about communication between the various systems as DinerMO is the universal connection.

iv. Screen Customization

The POS Suite will have graphical interfaces customized to suite your individual need and taste.

v. Compatibility

The open architecture of the DinerMO POS software means that it is fully compatible with most hardware. As well, this robust software package is supported by redundancy aspects that provide no single point of failure. Users of this product can rest assured that their investment in the DinerMO system is backed up with reliability and committed expertise.

2.2.4 Summary of Existing Taking Order System

Table 2.2: Summary of Existing Taking Order System

DynerTec	Restaurant Pro Express	DinerMO
a. Using handheld computer to take the order. b. Communication using wireless Ethernet.	a. Using touch screen point of sales (POS). b. Fully integrated food service system for Microsoft Windows. c. Microsoft Access compatible.	a. Using touch screen pc that running on Microsoft Windows 2000 or later. b. Developed using Microsoft .Net and Microsoft SQL Server. c. Flexible to all type of restaurants.

2.3 Hardware

Hardware is the physical aspect of computers, telecommunications, and other devices. The term arose as a way to distinguish the "box" and the electronic circuitry and components of a computer from the program that put in it to make it do things. Some hardware that will be going to use are such as workstation, switch, and access point.

2.3.1 Workstation

Workstation is intended for business or professional use (rather than home or recreational use). Workstations and applications designed for them are used by small engineering companies, architects, graphic designers, and any organization, department, or individual. According to Webopedia, in terms of computing power, workstations lie between personal computers and minicomputers, although the line is fuzzy on both ends. High-end personal computers are equivalent to low-end workstations. And high-end workstations are equivalent to minicomputers. Workstations are single-user computers. However, workstations are typically linked together to form a local-area network, although they can also be used as stand-alone systems.

There are several core components that must be installed in a workstation. All of the components will work together to ensure the workstations are working properly. The components are:

i. Central Processing Unit (CPU). CPU is the brain of workstations. It is a unit of a computer that includes the circuits controlling the interpretation of program instructions and their execution. The CPU controls the entire computer. It receives and sends data through input-output channels,

retrieves data and programs from memory, and conducts mathematical and logical functions of a program.

ii. Motherboard. A motherboard is the physical arrangement in a computer that contains the computer's basic circuitry and components. On the typical motherboard, the circuitry is imprinted or affixed to the surface of a firm planar surface and usually manufactured in a single step.

iii. Memory. The term of memory is usually used as shorthand for physical memory, which refers to the actual chips capable of holding data. Some computers also use virtual memory, which expands physical memory onto a hard disk. Every computer comes with a certain amount of physical memory, usually referred to as main memory or RAM.

iv. Hard Drives. A hard drive is stores and provides relatively quick access to large amounts of data on an electromagnetically charged surface or set of surfaces.

2.3.2 Switch

Switch is a device that channels incoming data from any of multiple input ports to the specific output port that will take the data toward its intended destination. Switches operate at the data link layer (layer 2) and sometimes the network layer (layer 3) of the OSI Reference Model and therefore support any packet protocol. On an Ethernet local area network (LAN), a switch determines from the physical device (Media Access Control or MAC) address in each incoming message frame which output port to forward it to and out of. In a wide area packet-switched network such as the Internet, a switch determines from the IP address in each packet which output port to use for the next part of its trip to the intended destination.