AN APPLICATION ON SMARTPHONES PARKING RESERVATION SYSTEM

[1]G Rama Rao, [2]A V Vamshi Krishna, [3]Kanakamma T, [4]CH prethi

[1,2,3]Assistant Professor,[4]Student

Department of CSE

Christu Jyothi Institute of Technology &Science,Colombo Nagar, Telangana

ABSTRACT

The number of smart phone users and mobile applications are increasing tremendously. The emergence of powerful portable devices and wireless technologies has made mobile computing a reality. In mobile computing, there is a tremendous surge of research in the area of data management. The object oriented database is used to manage the remote server. Now-a-days, finding a parking space is a tedious process for the car drivers. This paper proposes a parking system to solve the problem of unnecessary time consumption in finding a parking spot in commercial car parking areas.

 Keywords Mobile Operating System; Relational Database; Object database; Parking System.

1. INTRODUCTION

 A mobile device also known as a handheld device, handheld computer or simply handheld is a pocket-sized computing device, typically having a display screen with touch input and/or a miniature keyboard. Smart phones and PDAs are more popular amongst the mobile devices. In the case of the personal digital assistant (PDA) the input and output are often combined into a touch-screen interface. A mobile consists of three components: a mobile application that works as a customer, a wireless network connection and a server that provides the functionality or information (content) required by the application.

In congested urban areas parking of vehicles is time consuming and sometimes expensive. Where car parking spaces are a scarce commodity, and owners have not made suitable arrangements for their own parking then congestion occur. The main objective of this paper is to develop a parking reservation system that reduces congestion and time required to park a vehicle.

2. MOBILE OPERATING SYSTEM

 Mobile operating system is the software platform on top of which other programs, called application programs, can run on mobile devices such as mobile phones, Smartphone, PDAs, and handheld computers.

The most common operating systems (OS) used in smart phones are:

Android from Google Inc. (open source, Apache)

Android was developed by a small startup company that was purchased by Google Inc., and Google continues to update the software. Android is an open source, Linux-derived OS backed by Google, along with

major hardware and software developers (such as Intel, HTC, ARM, Samsung, Motorola and eBay, to name a few), that form the Open Handset Alliance. Released on November 5th 2007, the OS has a following among programmers. There have been seven releases of AndroidAndroid 1.0, 1.5, 1.6, 2.0, 2.1, 2.2 and 2.3. All are nicknamed after a dessert item like Cupcake (1.5) or Frozen Yogurt (2.2). Most major mobile service providers carry an Android device.

iOS from Apple Inc. (closed source, proprietary)

The Apple iPhone, iPod Touch and iPad all use an operating system called iOS, which is derived from Mac OS X. Third party applications were not officially supported until the release of iOS 2.0 on July 11th 2008. Before this, "jailbreaking" allowed third party applications to be installed, and this method is still available. Currently all iOS devices are developed by Apple and manufactured by Foxconn or another of Apple's partners.

BlackBerry OS from RIM (closed source, proprietary)

This OS is focused on easy operation and was originally designed for business. Recently it has seen a surge in third-party applications and has been improved to offer full multimedia support.

Symbian OS from the Symbian Foundation (open public license)

Symbian has been used by many major handset manufacturers, including BenQ, Fujitsu, LG, Mitsubishi, Motorola, Nokia, Samsung, Sharp, and Sony Ericsson. Current Symbian-based devices are being made by Fujitsu, Nokia, Samsung, Sharp, and Sony Ericsson. Prior to 2009 Symbian supported multiple user interfaces, i.e. UIQ

from UIQ Technologies, S60 from Nokia, and MOAP from NTT DOCOMO. As part of the formation of the Symbian OS in 2009 these three UIs were merged into a single OS which is now fully open source. Nokia handed the development of Symbian to Accenture, which will continue to support the OS until 2016.

Fig. 1: Market Share of Smartphone Operating System

3. EXISTING SYSTEM

The existing system makes use of traditional database for maintaining records (Record Management System (RMS)) in the server as shown in the figure 2. The data is stored as database. This may causes inconsistency if you want to process information from a server on the remote database.
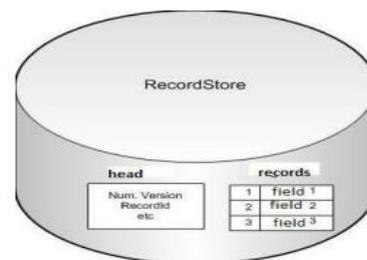

Fig. 2: Organization of records in the RMS

The parking reservation system is done by sending SMS (Short Message Services). When the user sends a SMS requesting for a parking reservation, the wireless communication instrumentation device called micro-RTU (Remote Terminal Unit) processes the information and sends the confirmation and a password. This password should be entered in the parking area and valid for a particular period of time. The parking reservation flow chart is shown below in figure 3.

The disadvantage of this type of parking reservation system is time consuming. The user needs to wait in the parking entry to validate their password, to get the lot number and for payment. If the user is late to the parking area then the validity expires.
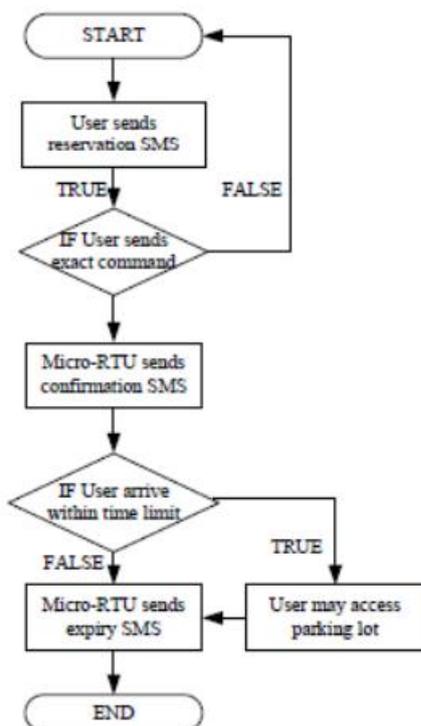

Fig. 3: SMS Parking reservation flow chart

4. PROPOSED SYSTEM

The new proposed system can make use of object oriented database for maintaining data at the server. The object oriented database is explained below.

4.1. Object Oriented Database

An object database (also object-oriented database management system) is a database management system in which information is represented in the form of objects as used in object-oriented programming. Objects basically consist of the following:

Attributes - Attributes are data which defines the characteristics of an object. This data may be simple such as integers, strings, and real numbers or it may be a reference to a complex object.

Methods - Methods define the behavior of an object and are what was formally called procedures or functions. The Comparison of relational database and object oriented database is shown in the figure 4.
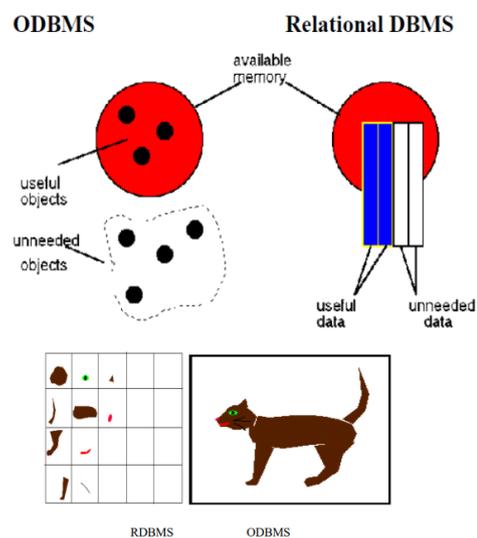

Fig. 4: Comparison of RDBMS and ODBMS

Advantages:

Objects don't require assembly and disassembly saving coding time and execution time to assemble or disassemble objects.

Reduced paging

 Easier navigation

Better concurrency control

- A hierarchy of objects may be locked.

Data model is based on the real world.

Works well for distributed architectures.

 Less code required when applications are object oriented

4.2. Online Parking Reservation System

 The user can reserve a parking area online from a smart phone which is independent on mobile operating systems. The user logs into the website and enters the place, period and number of vehicles and submits it to the server. The server searches for related positions and displays the rate for various possibilities. The user can select the place based on the rate. The server asks for the personal details and the payment mode. Once all these details are correct, the server sends a parking confirmation report. This process is shown in the flow chart in figure 5.

Fig. 5: Online Parking Reservation System

Advantages:

Saves time

 Car safety

 Easy and cost effective maintenance

Safety for drivers

 Environment friendly

Efficient

5. CONCLUSION

As conclusion, the objectives of this project have been achieved. In this system a kiosk device is present at the parking spot as the second security check. The road map is also shown for the respective parking lot that reduces the time required to search for the parking lot. The application can be applied in all Mobile OS. Mobile computing has proven a fertile area of work for researchers in the areas of database and data management. .NET is quite efficient tool for building applications for hand held mobile devices. If the developer keeps in his mind the limitation and make the good of use of his ability he can do a lot of job with this tool. We hope that the future generation products from Microsoft will be better than what they have provided us today. The designed system could be applied everywhere due to its ease of usage and effectiveness.
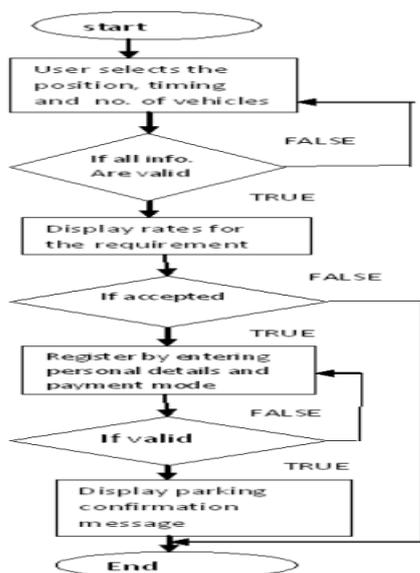
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