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JUDUL: BLUETOOTH BROADCAST ADVERTISEMENT SYSTEM

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BLUETOOTH BROADCAST ADVERTISEMENT SYSTEM

IEK ZEN JENM

This report is submitted in partial fulfillment of the requirements for the
Bachelor of Computer Science (Computer Networking)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
2009

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DECLARATION

I hereby declare that this project report entitled
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is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ Date: _____
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SUPERVISOR : _____ Date: _____
(EN.ARIFF IDRIS)

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DEDICATION

I dedicated this thesis to my beloved family. Without their patience, understanding, support and love, the completion of this work would not have been possible. I would also like to dedicate to the authors of hundreds of books and research journals and also to program expertise in online forum, without whom there would be nothing to support my words or code my program. I make no claims about the contents of this book originating from my research and findings. I must also dedicate this thesis to my supervisors who have inspired and assisted me throughout this research. Finally, I dedicate to all friends and to everyone who have directly or indirectly helped and support me.

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ABSTRACT

The Bluetooth Broadcast Advertisement System is developed mainly for the use of shop's owner in the shopping mall. Shop's owner will use this system to do advertising to attract more customers to its shops. Shop's owner can store the digital advertisement inside the computer. Then shop's owner can choose to broadcast the advertisement or send it manually to the customers that had Bluetooth enable mobile phones that pass by. Before the shop's owner can use this system, he or she need to login first with password. The database use Microsoft Access and all the data are stored there. Only people with password can login into the system and use the system. The methodology used in developing the system is Waterfall model after a literature review had been done on several existing system. Bluetooth Broadcast Advertisement System are develop using vb.net because there is the need of library and shared project related to Bluetooth that can be download free from the internet. An analysis study has been done based on the current manual system and all the problem statements and requirements have been identified. Moreover, Bluetooth Broadcast Advertisement System interface has been designed according to the requirement and needs of the current market. Bluetooth Broadcast Advertisement System will help to increase the profits of the shop's owner by saving the flyer's printing cost and flyer's distributing cost.

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ABSTRAK

Bluetooth Broadcast Advertisement System dihasilkan untuk kegunaan pemilik kedai dalam pusat membeli belah. Pemilik kedai akan menggunakan sistem ini untuk menghantar iklan kepada pelangan dan iklan tersebut akan menarik perhatian pelangan ke kedai tersebut. Pemilik kedai boleh menyimpankan iklan digital di dalam komputer. Pemilik kedai kemudian boleh memilih untuk menyiarkan iklan atau menghantar ia secara manual kepada pelanggan-pelanggan yang memiliki telefon bimbit yang boleh menerima hantaran Bluetooth daripada pemilik kedai itu. Sebelum pemilik kedai boleh menggunakan sistem, mereka perlu log masuk sistem ini dengan kata laluan. Microsoft Access digunakan sebagai pangkalan data dalam sistem ini dan semua data adalah disimpan di sana. Hanya pennguna yang memiliki kata laluan boleh log masuk kepada sistem ini dan mengunakan sistem ini. Kaedah yang digunakan untuk membangun sistem ini adalah model Waterfall setelah beberapa sistem berkaitan dengan Bluetooth telah dianalisis. Bluetooth Broadcast Advertisement System dihasilkan dengan menggunakan vb.net kerana vb.net membekalkan projek kongsi dan segala yang berkaitan dengan Bluetooth kepada pengguna untuk dimuat turun secara percuma. Satu kajian analisis telah dibuat berdasarkan arus sistem manual dan semua kenyataan-kenyataan masalah dan syarat-syarat telah dikenalpasti. Antara muka Bluetooth Broadcast Advertisement System telah direka mengikut keperluan pasaran semasa. Bluetooth Broadcast Advertisement System ini akan membantu meningkatkan keuntungan kedai dengan penjimatan kos percetakan risalah dan kos pengagihan risalah.

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LIST OF ABBREVIATIONS

SDLC	System Development Lifecycle
RAD	Rapid Application Development
TCP/IP	Transmission Control Protocol/Internet Protocol
WBS	Work Breakdown Structure
ERD	Entity Relationship Diagram
DBMS	Database Management System
DDL	Data Definition Language

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REFERENCES

[1] Jaap Haartsen, (1998). BLUETOOTH - The universal radio interface for ad hoc, wireless connectivity. [Online] Retrieved on March 20, 2009 from http://www.cs.huji.ac.il/course/2003/postPC/docs/Wireless_and_Bluetooth

[2] Brochuremonster.com. (2009). [Online] Retrieved on March 18, 2009 from http://www.brochuremonster.com/more-brochures/free-business-flyer.aspx

[3] Johnson, Chadwick Hugh, (2005). High Level Design - Distributed Network Traffic Controller [Online] Retrieve on April 1, 2008 from http://people.ok.ubc.ca/rlawrenc/research/Students/CJ_05_Design.pdf

[4] Ariel Ortiz Ramirez, (2000). *Three-Tier Architecture.* [Online] Retrieved on March 9, 2008 from http://www.linuxjournal.com/article/3508

[5] Jiantao Pan, (1999). *Software Testing.* [Online] Retrieved on June 16, 2008 from http://www.ece.cmu.edu/~koopman/des_s99/sw_testing/

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BIBLIOGRAPHY

1. Forouzan, B.A (2007). "Data Communications and Networking." 4rd edition. New York, USA: McGrawHill.

2. Bradley, J.C & Millspaugh, A.C (2006). "Programming in Visual Basic .NET" 2005 edition. New York, USA: McGrawHill.

3. Selby, R.W & Boehm, B.W (2007). "Software Engineering." California, USA: Wiley-IEEE.

4. Dilloway, M & Kumar, R (2007). "Bluetooth FOR DUMMIES." New Jersey, USA: John Wiley & Sons.

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CHAPTER I

INTRODUCTION

1.1 Project Background

Bluetooth is a universal radio interface in the 2.45 GHz frequency band that enables portable electronic devices to connect and communicate wirelessly via short-range, ad hoc networks [1]. Bluetooth is also a low cost, low power, short-range radio technologies intended to replace the cable connections between hand phones, PDAs and other portable devices. Bluetooth is the most widely supported, versatile and secure wireless standard on the market today.

The shops in the shopping mall always try to attract customer by having promotion or sales. One of the ways to attract customer is by giving flyers around the shopping mall so that customer can know about the promotion or sales. Project of Bluetooth Broadcast Advertisement System can help the shops in the shopping mall to advertise its promotion through Bluetooth technology.

This project will produce a system that can detect any device that equipped Bluetooth communication. Then the system will automatically connect to the device and send commercial advertisement or e-flyers to the customer mobile phones through Bluetooth. Customer will know about the promotions through Bluetooth. This system also helps the shops in the shopping mall owner to save money or cost on hiring workers to give flyers and also printing of flyers. It also helps the environments by saving paper and thus saving trees.

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Bluetooth are chosen to be the transmission medium for the system due to its functionality. There is a Bluetooth Special Interest Group, SIG that are responsible for the further development of the Bluetooth standard. Sony Ericsson, Intel, IBM, Toshiba, Nokia, Microsoft and Motorola are some of the companies involved in the SIG. The composition of the Bluetooth SIG is one of the major strength of the Bluetooth technology.

The mixture of both software and hardware supplier participating in the further development of the Bluetooth technology ensures that Bluetooth products are made available to end users. Microsoft support Bluetooth in their Microsoft Windows Operating System. Bluetooth software is made available to the vast majority of the desktop software market. Nokia, Motorola, Sony Ericsson and others company include Bluetooth technology in their mobile phones. This all adds up to a wide availability of the Bluetooth technology for end users.

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1.2 Problem Statements

Advertising is important because it helps to keep the consumers informed about whatever new products or services are available in the market at their disposal. It helps to spread awareness about products or services to consumer and potential buyers. Advertising on the whole helps business to prosper and makes the consumer aware of the various choices that are available.

Flyers are one of the business tools that have been used for many years in marketing and advertising. It is a graphical piece of paper that any business would give out for free. The purpose of these flyers is to promote the business and to create image between the people of its existence. They are distributed to different people and to the present clients in order to make them more aware about the company. They hold information about the company, its business, products and services and contact details [2].

Flyers can be used to sell product, promote product and promote services in a number of other areas. Distributing flyers in a mall is a waste of papers because people normally read briefly and then throw it away if it is not important to them. It is also wasting of labour cost to give flyers around the shopping mall. Shop owner also cannot confirm that his or her workers are honest in giving flyers. The worker may throw away all flyers and cheat the owner about distributing it.

Bluetooth Broadcast Advertisement System will replace the flyer's function in advertising by detecting Bluetooth equipped device that is mobile phone nearby and broadcast commercial advertisement to it.

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1.3 Objective

The aim of this project is to create a Bluetooth system that can detect Bluetooth device that is mobile phones and send Bluetooth advertisement picture to the detected mobile phone by skipping the Bluetooth pairing option. The system also can send auto broadcast advertisement to all detected Bluetooth device. Below are the objectives of the project:

i. The system will scan and detect the available Bluetooth equipped device that is mobile phones in its range.

ii. The system can let user select the advertisement file stored in computer.

iii. The system will try to make connection to the chosen detected mobile communication device and send the selected advertisement to it through Bluetooth.

iv. The system will start search for Bluetooth enable device and send advertisement to it automatically after user start the system. The system will stop search for Bluetooth enable device after user stop it.

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1.4 Scope

This project is to develop a Bluetooth Broadcast Advertisement System that function is to automatically detect and connect to the Bluetooth enabled device to broadcast advertisement. This system is targeted to be used by the shop's owner of a shopping mall within Bluetooth communication range. Shop owner can choose to select one user at a time and send advertisement to it. Shop owner can save cost by using this type of advertisement and increase the shops sales when more customers come to the shops after notice about the promotion.

1.5 Project Significance

This project provides a low cost advertisement for shop's owner mall. Customer can get information about items on sales and shops owner can make more profit by saving cost in digital advertisement and having more customers comes to shops in the shop. This type of advertisement also helps in saving the trees or environments where there is no need of printing flyers. Customers, shops owner and environment will benefits from Bluetooth Broadcast Advertisement System.

1.6 Expected Output

The expected output of Bluetooth Broadcast Advertisement System is to implements Bluetooth technologies in the advertisement or business environment. This project provides a digital interaction between the customer and the shop's owner. Profits can be increase by reduction of labour cost, printing cost and advertisement cost.

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1.7 Conclusion

Conclusion of this project is to develop a Bluetooth Broadcast Advertisement System that is beneficial to everyone. This project can help many shops owner to save cost in advertisement. This project also demonstrates the usage of Bluetooth Technology and made user realize that Bluetooth can be implemented in different kinds of fields. Bluetooth is open source and it should be implemented more in many kind of purpose including profit and non profit purpose. The objectives of the project need to be achieved within the scopes stated as this project finish.

Literature review will be discussed in the next chapter that is related to this project according to the research that are made.

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