PERFORMANCE ANALYSIS OF ZIGBEE-BASED WIRELESS VIRAL ADVERTISEMENT SYSTEM FOR LAND PUBLIC TRANSPORT

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A report submitted in partial fulfillment of the requirement for the degree of Bachelor of Mechatronic Engineering

Faculty of Electrical Engineering

UNIVERSITY TEKNIKAL MALAYSIA MELAKA

2012

I declare that this report entitle "PERFORMANCE ANALYSIS OF ZIGBEE-BASED WIRELESS VIRAL ADVERTISEMENT SYSTEM FOR LAND PUBLIC TRANSPORT" is the result of my own research except as cited in the references. The report has not been accepted for any degree and is not concurrently submitted in candidature of any degree

Signature :

Name :

Date :

To my beloved mother and father

ACKNOWLEDGEMENT

The special thank goes to my supervisor, Mr. Nik Syahrim bin Nik Anwar. The supervision and support that he gave help in the progression and smoothness of the project. His advice is most appreciate.

My grateful thank also to our group members, Muhammad Subhan, Ahmad Nordin, Muhammad Firdaus for their effort and cooperation during process to complete the project. Their passion deserves to be appreciate.

Last but not least, gratitude to my parents. Without their, I won't be here. Their encouragement and support make me further the study to upper level.

ABSTRACT

The normal banner cannot be updated daily. So it is not a real time advertisement. The proposed can transfer advertisement from shop to the bus and the advertise it at bus stop. The system will be analyze based on performance parameter of maximum data transfer versus time. The objective of this research is to analysis performance of zigbee-based wireless viral advertisement system for land public transport. Data for the needed, which is maximum data transfer can determine by formula speed of data transfer multiply with times. Times for all the data to transfer taken by stopwatch. Speed data transfer as stated in zigbee module.Wireless such as GSM, HSDPA, Bluetooth and etc are improving as time move. Needed of wireless devices are common for the users. As for typical advertisement, usage of banner still in use even though it is not practically reliable. By using the system, advertisement can be transfer from a shop to the bus and then the bus stop. Based from datasheet Zigbee pro, it radius can reach 1.5km for open space and 100m for indoor usage. The real data maybe slightly different because of some factor (exp : obstacle, humidity and etc). Uses of wireless (Zigbee) in advertisement can overcome barrier of space and time that are happen now. The system also can provide real-time advertisement.The prototype expected to function properly and can be use to analyze performance parameter (data transfer versus time).

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CHAPTER 1

INTRODUCTION

1.1 Problem Statement

The advertisement especially using banners are always hanged for a long period. New advertisement can't be hang if the old advertisement is still there. Usually, spaces for hang the advertisement are limited at certain area only. Plus, the advertisement is in not real time. Normal banner can't be updated daily because lack of space. Paper based banner are also not good for the environment. It will be dump after use. These actions contribute to other environmental issues. Electronic banners can reduce usage of papers thus reducing the need for forest destruction.

1.2 Objective

There are some objective drawn for this project

1) To design a real- time advertisement
2) To expand area of the advertisement so it is not fix to certain area only
3) To make the advertisement show are up to date.
4) To study the performance parameter of maximum data transfer versus distance.

1.3 K-chart

K-chart is a systematic organizing for research. In this K-chart show the scope, methodology, and the result presented.

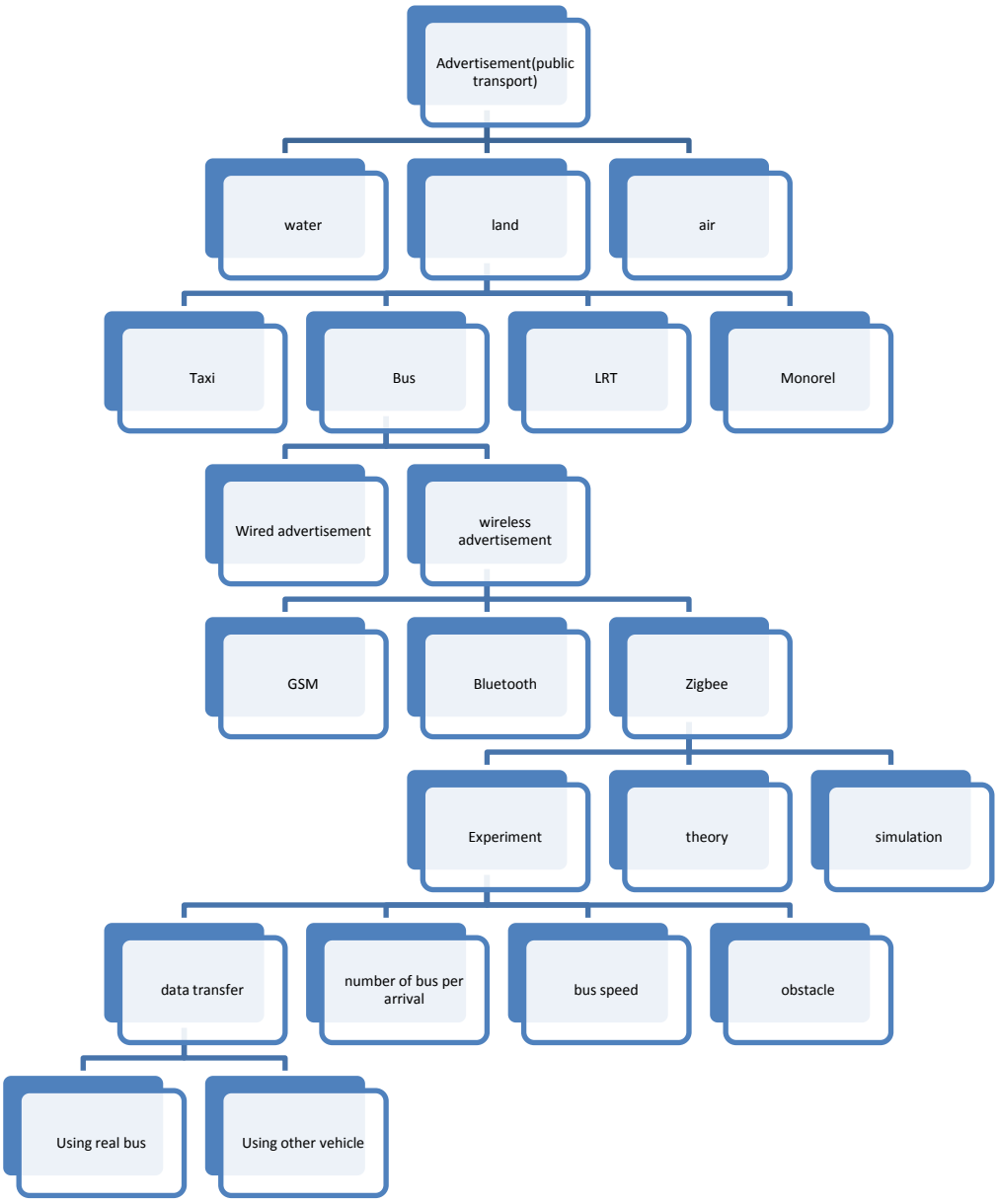


Figure 1.1 K-chart

1.4 Scope

This project only supports limited number for bus arrival. Range of zigbee detection may varied by the obstacle. Datasheet show the radius of zigbee at open field about 1.5 km (line of sight). Obstacle can disturb the radio frequency as data transfer using radio frequency, energy of transmission decrease. Plus, radio frequency did not has penetration power line gamma or x-rays [8]. Testing will be not be done by using real bus.

CHAPTER 2

Literature Review

2.1 Introduction

In this section, wireless protocol and related protocol for transmit the data will discussed. The main purpose for this research to find the beast communication medium for wireless viral advertisement. There are certain medium that are in consideration to be chosen. There are Zigbee, GPS-based system, digital signal network and cellular network.

Zigbee is a communication medium which use radio frequency and use for short range transmission. Zigbee not bound to coverage area. As long as there are Zigbee device, it can transfer and receive. Zigbee offer other alternatives to the place where there are no coverage of 3G, WiMAX, or other long range wireless technology. The potential of Zigbee still in experimental stage. The fact that Zigbee is a low power device and use for short range is well known. Zigbee always had been use for home application [6].

3G, WLAN and other long range wireless technologies are more convenient for set a system with high coverage but the long range wireless system has their weaknesses. The long range wireless system consumes larger power than short range wireless system. Problem for this system is need to set up a tower for coverage radius. It needs lot of money to set up a 3G area. Even though the cost is expensive, the coverage area is longer than other system.

2.2.1 Advertising

Advertising is a method to boost up the sales for the product. It also used to build a brand identity and introduce new product or service to the customer. The importance of advertising makes large company consider a lot of money toward their advertising budget. There are several reason for advertising [7]:

1) Increasing the sales of the product or service
2) Creating and maintaining a brand image
3) Introduction of new product
4) Increasing buzz-value of the brand or the company
5) Communicating a change in the existing product line.

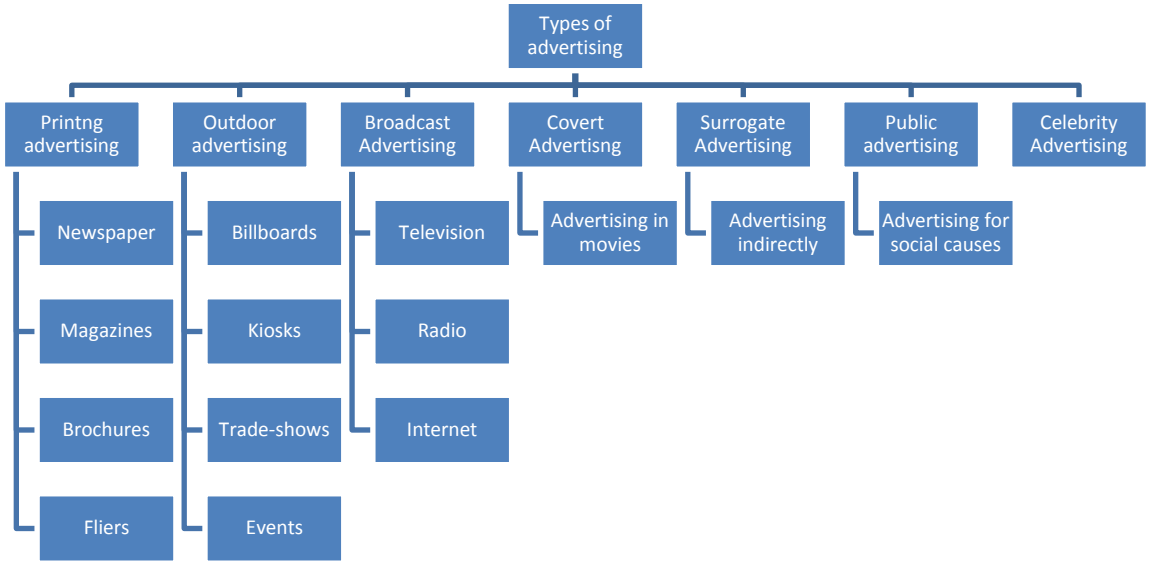


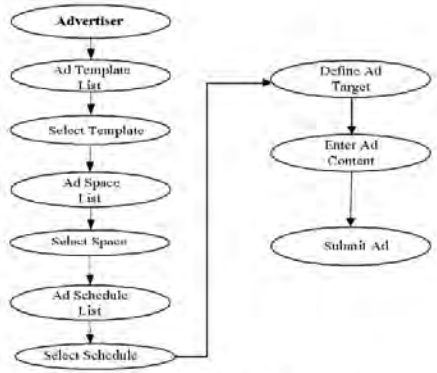
Figure 2.1 Types of Advertising

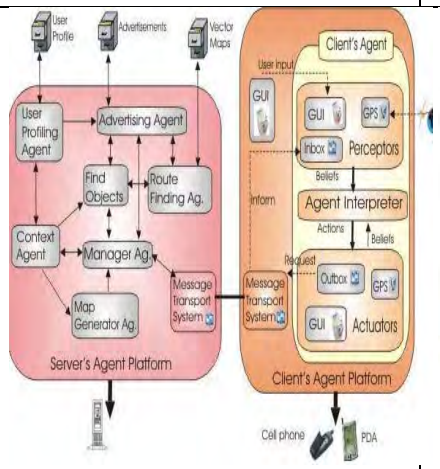
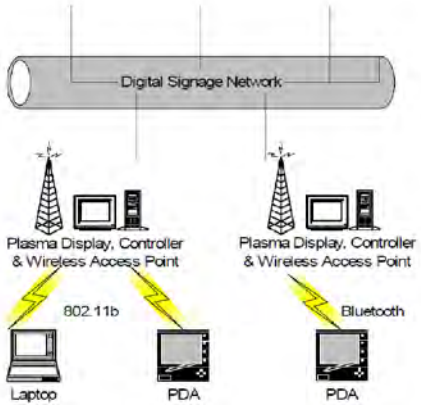
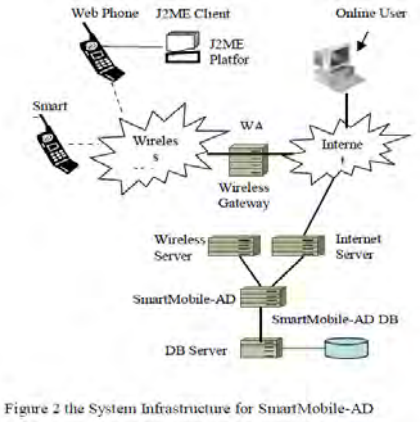
Figure 2.1 shows types of advertisement that available in our community. This project focuses on the outdoor advertising. The outdoor advertising must be able to capture people attention.

2.2 Comparison

For this paper, the three different journal compare with the project. Even though the medium of the transmission of each case are different but the fundamental of advertisement is still same. All the application focus on how to improve advertisement system. Some of the project are more superior than this project, but the usage of Zigbee chose because it is cheap and can be use for a long time.

Table 2.1 Comparison between 3 journal and the proposed project [2][3][4]

	Ad-me	Digital Signal Network	SmartMobile-Ad	Zigbee based (this project)
Year of publish	2004	2004	-	-
Description	Activation of GPS will detect the position of the user. It will show the advertisement for the nearest shop	Data transfer using data using a network (eg: fiber optic)	 Figure 7 the Workflow for Advertisers	Data (advertisement) from the shop will be transfer to the bus in range and then to the bus stand which is the bus arrive or pass by.

Overview system			 Figure 2 the System Infrastructure for SmartMobile-AD	
Wireless platform used	GPS	Bluetooth and 802.11b	WAP MMS	Zigbee
Target user	PDA and cell phone	Laptop, PDA and cell phone	Cell phone	Public transport
Advantages	1. Profiling 2. Content can be personalize by the user 3. Galvanic skin response (detect the sentic data, heart rate and self-assesment)	1. Envision the density of the sign at a geographic location 2. Ability to present dynamic multimedia 3. Offers significant improvement in cost and effectiveness	1. Ease to access 2. Reasonable cost 3. Ease to personalize	1. Real time application 2. Up to date system 3. Expand the advertisement area

		4. Offers near-real time Low cost in installing and distribution of digital advertising		
Disadvantages	1. System operates in an outdoor environment 2. While roaming through different cells, misinformation,, malicious downloads, or denial of service may occur 3. Issues surround the collecting of personal preference and user geographic location.	1. Viewers only receive the information that is presented on the sign 2. Viewers only have access to the information while they are viewing the sign. 3. Viewers cannot easily respond to the advertiser at the time viewer is most likely to respond.	1. Limited number of user 2. Slow speed download 3. Broad technology spectrum	1. Only respond for zigbee to zigbee communication 2. Range for transfer data limited in zigbee detection range

2.3 Discussion

This part will discuss about Table 2.1, the different between Ad-me, Digital signal network, SmartMobile Ad and Zigbee based system. Firstly, about the medium used to transfer information. For Ad-me, it use GPS to detect the position of user and then the nearest point of interest for the user will be shown. While for the Digital signal network, the information transfer by using network such as Bluetooth or 802.11b method. 802.11b is a method or protocol use for wifi to transmit data. SmartMobile-Ad utilizes MMS and WAP to transmit. For Zigbee, it use radio frequency as a medium to transfer. Ad-me, Digital signal network and SmartMobile-Ad need a network to transfer. It means they need a telecommunication provider to use the application. On the other hand, Zigbee only need to use the module to transmit and receive. Based on these information, Zigbee are more flexible compare to others.

Focus of this project is to public transport but Ad-me and other system except Zigbee design either for phone users, PDA users or internet users. The target user for this project and the review system do not match. The reason why chose ad-me and other journal not because of its target users but the fact that the system use to advertise. Ad-Me, SmartMobile-Ad and digital signal network categorized in broadcast advertisement while Zigbee system is outdoor advertisement.

CHAPTER 3

METHODOLOGY

3.1 OVERVIEW

Figure 3.1 is basic concept of the project. It involve receive and transmit data between shop, bus and bus stand.

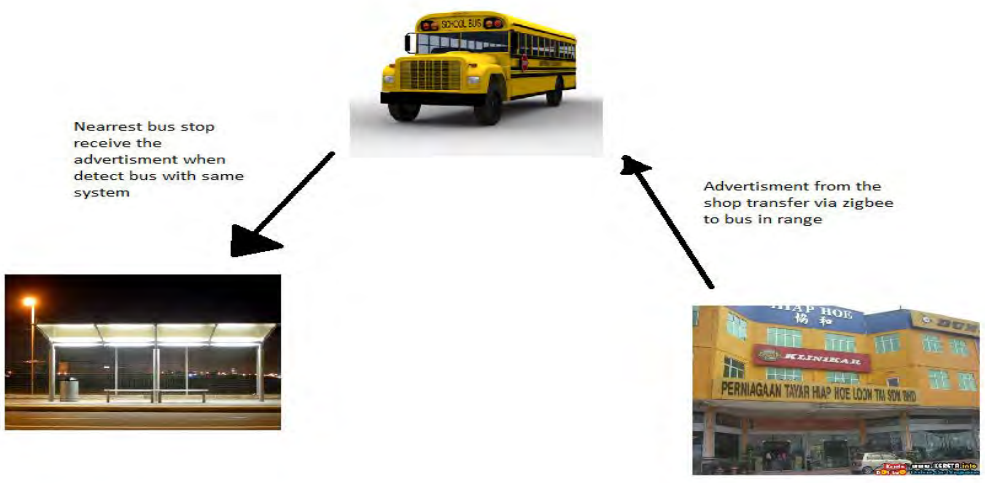


Figure 3.1 Basic concept of the system

For this project, there are several steps taken before the project end. Below is sequential need to do before the project complete.

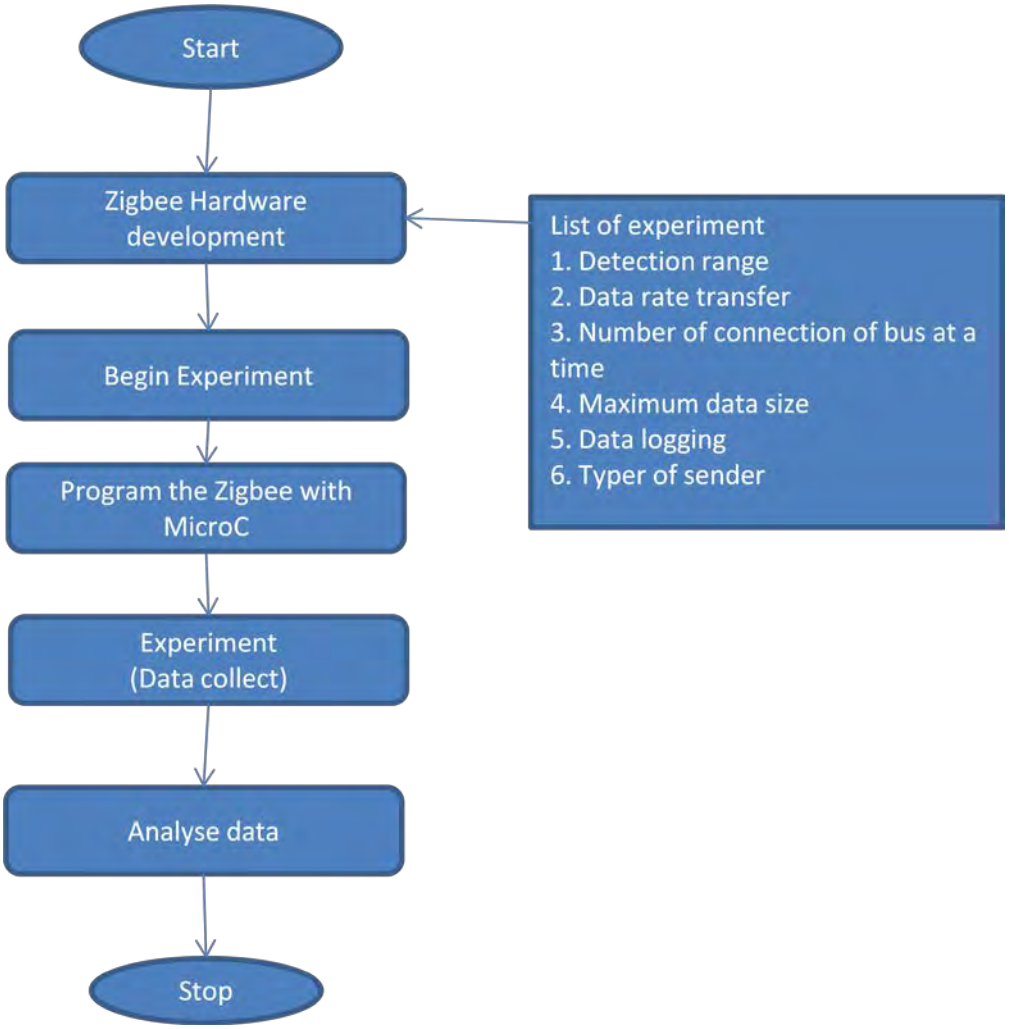


Figure 3.2 Flow chart for project sequences

Figure 3.2 is flow chart of the whole project. Start from basic which is software and hardware development to the experiment. There are 7 types of experiment

3.2 COMPONENT USED

3.2.1 PIC 16F877A

Pic16F877A has some distingue characteristic. The characteristic of PIC16F877A shown in Table 3.1.

Table 3.1 PIC16F877A Features [9]

Features	PIC16F877A
Operating frequency	DC-20MHz
Resets (and delay)	POR,BOR(PWRT,OST)
Flash Program memory	8k
Data memory	368
EEPROM Data Memory (bytes)	256
Interrupts	15
I/O Ports	Ports A,B,C,D,E
Timers	3
Capture/Compare/PWM modules	2
Serial communications	MSSP,USART
Parallel communications	PSP
10-bits Analog-to-Digital module	8 input channels
Analog comparator	2
Instruction set	35 instructions
Packages	40-pin PDIP 44-pin PLCC 44-pin TQFP 44-pin QFN

Figure3.3:microcontroller