A STUDY OF M-COMMERCE USAGE AMONG MOBILE PHONE USERS IN BANGKOK

by

Ms. Sirichan Srichaisak

A Final Report of the Three-Credit Course
CE 6998 Project

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in Computer and Engineering Management
Assumption University

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Project Title	A Study of M-Commerce Usage among Mobile Phone Users in Bangkok
Name	Ms. Sirichan Srichaisak
Project Advisor	Rear Admiral Prasart Sribhadung
Academic Year	March 2002

The Graduate School of Assumption University has approved this final report of the three-credit course, CE 6998 PROJECT, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer and Engineering Management.

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|	
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March 2002

ABSTRACT

This report presents the analysis and guide M-commerce customer's purchasing behavior. M-commerce customer's thought and opinions will solve the current problems and show us how to lead M-commerce service market. The objective of this project is to boost the interest of customer while carrying mobile phone and the trend of customer behavior in the future. The study of this report begins with a brief history of mobile phone and current mobile phone system around the world as well as in Thailand.

Finally, the major outcome of this project is providing marketing & operation Department to understand current situations and problem. It will help to understand customer's purchasing behavior and develop new marketing system for customers. It will provide better services to the customers as well as management.
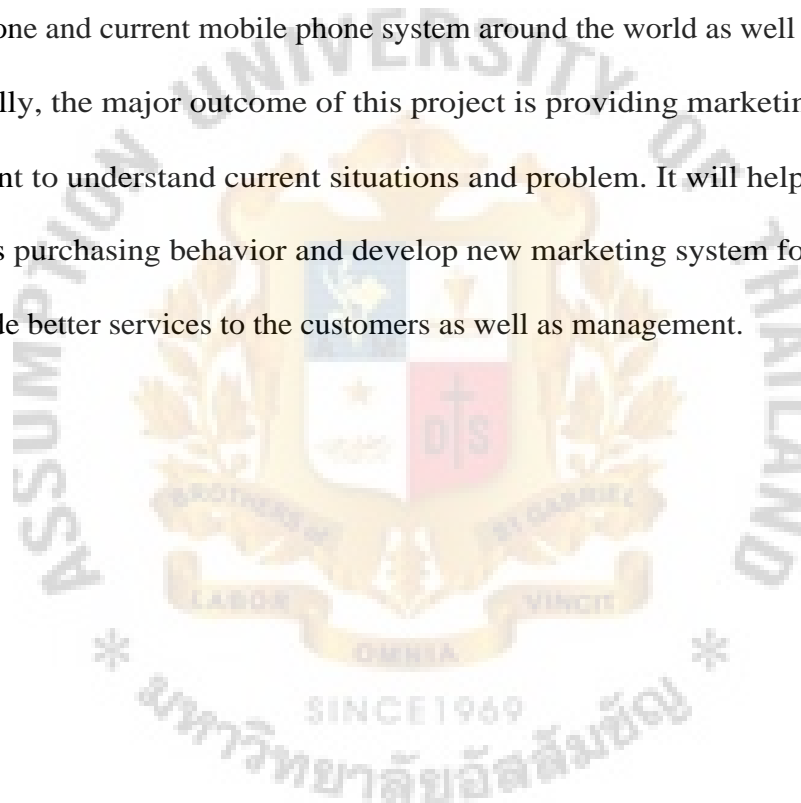
ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to Rear Admiral Prasart my project advisor, for his valuable suggestion, guidance. I probably couldn't complete this project without his effort. Also, I am grateful to Ajarn Duangnaid who grant me knowledge how to write research to me through research methodology class.

I am also grateful to some of my friends who support and encourage me whenever I face difficulties through this project.

Finally, I really appreciate to my family for their continuous encouragement for my education goal and any specially grateful to my father and mother to their love.

TABLE OF CONTENTS

LIST OF FIGURES

I. INTRODUCTION

1.1 Background of the Project

Nowadays, Internet and computer network are the symbols of advance technology system. In terms of business, Internet could supply the human being's demand, education and entertainment. We could know the world's movements, music, fashion, sport, news and your favorite programs.

In the world of communication, everyone knows that a telephone is the most important thing in communication. We can do business through telephone, which make the world small. Mobile phone is the advance system in this period that makes our lives easier, faster in communication and modern life. Not only in talking through mobile phone we can also send/receive messages, shopping, check cinema programs which is the one way in business.

M-commerce becomes very popular in the business world. This is because we can connect Internet 24 hours a day. It means that there is no break time, no idle time, no holiday for business by Internet. That's why, many companies try to create and develop their website to promote their company.

The famous web site can earn high profits and provides information to public in forms of advertising. M-commerce is the one way for the customer to choose the convenient way to shopping. WAP of M-commerce phone is also the way to convince the customer to consume the product and service such as buy cinema tickets through M-commerce to reach the WAP's target.

This project analyzed behaviors and characters of customer on M-commerce, most consumers who buy and are interested in the product from Internet is male or female? And what option do the customers who use the mobile phone demand? And the

potential of M-commerce market. In this research I would like to use questionnaires in doing this project and emphasize on people who use mobile, M- commerce through WAP of M-commerce in the Bangkok area.

1.2 Objective of the Project

This project is carried out to help to the company to understand customer behavior who use M-commerce. It shows that customers need the kind of function used frequently and which function needs for future M-commerce market. This project shows interest of customer while carrying mobile phone. Companies in this fields should analyze and identify customer behavior. This project also designs and implements the trend of customer behavior in the future. This would help to boost sales through M-commerce from the normal business.

1.3 Scope of the Project

This research project focuses on all M-commerce users in Bangkok area and characteristics of customers on M-commerce. Whether most M-commerce buyers are male or female and age target the potential of M-commerce market in the future. I'm going to use questionnaires in doing this project and emphasize on M-commerce user's purchase behavior in the Bangkok area.

II. LITERATURE REVIEW

2.1 History of Cellular Technologies

2.2 Analog Cellular

Analog systems are first generation mobile and used frequency modulation for the voice, digital frequency shift keying for signaling. The first system went on the air in October of 1983 in Chicago. The crucial analog mobile systems are as below:

(1)   America

AMPS

(2)   Europe

NMT all over Europe

TACS in United Kingdom, Italy, Austria, Spain and Ireland

C450 in Germany and Portugal

Radiocom 2000 in France

RTMS in Italy

(3)   Japan

NTT system

IDO system

DDI cellular group

(4)   Asia, Africa, Australia and other parts of the world

AMPS

NMT

TACS

2.1.1 Digital Cellular

The mobile industry moved to digital technologies by demand in the United States and the need to have a Pan European system in Europe. Digital cellular has advantages compared to Analog. The quality of voice and speech quality are better than Analog. The quality of the voice remains fairly constant until the connection can no longer be maintained. It can handle data more easily. We can get a higher data rate through digital circuit.

Also, Digital system provides encryption easily. In addition, digital cellular is in data as well as a much more secure authentication process to greatly reduce the rampant problem of cellular fraud. The standards developed in North America are Digital TDMA IS5$^4/_1$36, and Digital CDMA IS 95. The standard developed in Europe for this band is GSM 900. The standard developed in Japan is PDC. GSM is finding great acceptance throughout the world. In 1982, the Conference of European PTs(CEPT) established what was then called Group Special Mobile.

It's original intent was to develop a Pan European cellular system to allow Europeans to roam from one country to another with a single mobile. Now GSM stands for Global System for Mobile Communications and seems to be living up to its new name. More countries than any other digital cellular standard are adopting it.

2.1.2 WAP

Currently,the number of mobile users, compared to 200 million PC. By 2003, mobile phone users are expected to reach at least one billion, or one out of every six people on the planet. Mobile phone users have a huge user base, and mobile telephony already has a gigantic platform for communication and this platform is growing everyday. Now, imagine the emergence of a new technology that enables all their mobile phone users to access the Internet. A mobile Internet, with a thriving mobile

4

Internet, M- commerce would not be far behind. The mobile Internet exists today and is made possible by a new technology that links wireless devices to the Internet. This technology is WAP. However, it is inconvenient to bring a personal computer with us everywhere, especially if we are going abroad. If we use a notebook computer, we will have to pay more money to buy a modem or a mobile phone, which are expensive, and the size of a notebook computer is big. Thus, Wireless Application Protocol (WAP) starts to be more accepted today and it has been made to have an easy Internet connection. The benefits of integrating wireless and Internet technology have been recognized for many years. The 1990s saw rapid growth in the use of mobile phones and the Internet and during this time several telecommunications companies were working on projects to offer the Internet on their phone networks. However, the merger of the two technologies was held back by a lack of industry standards. WAP was launched in 1997 by partnership between the cellular phone companies Nokia, Motorola, Ericsson and the software Development Company Phone.com who set up the WAP Forum. The WAP Forum is a non-profit organization for creating global standards that allow wireless devices to access Internet content. It now comprises more than 200 members from the telecom, IT and software sector who together represent more than 100 million mobile subscribers. The mail objective of the WAP Forum is to create, maintain and update a protocol specification based on exist Internet standards. Regulation of the specification will allow manufactures, content providers and application developers to offer compatible services on all devices and networks. WAP stands for the Wireless Application Protocol. WAP is the technology that makes it possible to link wireless devices to the Internet by translating Internet information so it can be displayed on the displayed on the display screen of a mobile telephone of a mobile telephone or other portable device. WAP services, compared to other new

5

technologies in the past—very fast compared to the web, mobile voice communications, personal computing, and so on—and the delivery of services, which are no better or worse than the early days of the web, personal computing, mobile voice communications, or video-gaming, and realize that by a number of measurements mobile Internet uptake is going well thanks to the WAP standards and that, in any case, the benefits of mobile communications ae so hugely compelling (the biggest mass market medium ever) that it is more inevitable than the web ever was, much bigger and broader in its appeal and much more useful. It depends on how far M-Services succeeds. Undoubtedly presenting a consistent on-screen experience to users will encourage more usage of mobile data services and also provides a benchmark for application development. Reducing the variability of design in devices and applications enabled PCs to become pervasive and PC applications to become an embedded part of business life. PCs are too difficult to become mainstream quickly whereas phones are much further reaching so the opportunity to engage the mass market. Mobile operators and handset vendors are leading the way in effort to bring Wireless Application Protocol Services in Thailand. WAP allows access to the WEB via the mobile phone. Total Access Communication (TAC) and Advance Information System (AIS) are two dominant cellular operators in Thailand, start —offering WAP.

While operators have typically led service innovation elsewhere, in Thailand. Vendors like Ericsson have foiined an alliance with about 20 local Thai firms hoping to offer positioning, mobile office, and interactive WAP applications on the local market within a year. Nokia plans to begin offering passive information browsing, gradually moving toward interactive and, finally, financial applications. Operators are expected to spend much of that money making their networks WAP-capable. While increasing capacity and network upgrade will be a priority for operators to absorb demand. Although TAC

and AIS are developing WAP services, few services with mass appeal are currently available or likely to be available in the near future. Thus, WAP users get very little for premiums paid to own a WAP-capable phone, further hindering growth in WAP usage in the short teiiii. It is expected that WAP users to be 1% of the total cellular subscriber base in 2004.

III. RESEARCH METHODOLOGY

3.1 Introduction

The M-Commerce is the new way to reach the target market and communicate with highly involved and interested consumers, domestic and global. To reach on-line buyers, advertisers have to create an information-rich, interactive form of marketing for a personalized sales approach. E-mobile marketing represents the next generation of advertising and smart marketers are already using the mobiles which are always in the user hands as a powerful new way to create consumer awareness, and to sell their products and services. Marketing, sales promotion and advertising are the important avenues through which buyers and sellers are brought together in an exchange process.

It points out that a mechanism is required to make the selling job of advertising generate information to consumer. If the consumer finds relevant and useful information WAP pages that helps him or her to make an intelligent choice in a purchase situation and convenience, the investment made by corporations on WAP pages would find the expected returns.

3.2 Research Design

This research is conducted as the descriptive research by which the survey method is used in gathering the primary data. All information will be gathered from people of my sample size who are living in Bangkok areas. The personal interviews are expected to last 10 minutes or may depend on the respondents' cooperation and knowledge about WAP and E-mobile consumers. By using personal interview method, I can obtain high participation from the respondents in providing completed answers to question.

3.3 Research Sample

Sampling is the process of selecting a number of units for a study in such a way that the units represent the large group from which they are selected comprise a sample; the large group is referred to as a population.

$$n = \frac{N}{1 + e^2 N}$$

The population of mobile phone user in Thailand

Sample size

The standard error

Population of Mobile Phone user in Thailand (N) is around 4500000 users (http://www.nitc.go.th).

The standard error is 0.05

$$n \quad \frac{4500000}{1 + (0.05)^2 \, 4500000}$$

399.96

400 questionnaires are required

Sample Frame   Bangkok Area

Data collection From   Questionnaire

Sampling design : Nonprobability sample with convenience sampling are used

also.

9

Preparing Questionnaire

A researcher must know exactly what information is to be collected from which respondents by what techniques. A good way to begin writing a questionnaire is to anticipate possible source of error so that they may be avoided.

My questionnaires are closed-ended with fixed alternative questions to test their awareness and opinion toward E-mobile user in Bangkok.

Sample Population

The sample of this study is 400 sets. The researcher used random sampling and area sampling to select the respondents as following:-

Mobile phone shops:

    (1)   4th floor Maboon Krong Center

    (2)   Tawanna at Bangkrapi

Universities

    (1)   Assumption University

    (2)   Chulalongkorn University

Shopping Mall

    (1)   The Mall department store Ramkhamheang

    (2)   Emporium department store Sukhumvit road

    (3)   Pantip plaza Petchaburi road

Data Collection

There are two main types of data resources, primary data and secondary data. For primary data, it is collected through questionnaires' survey with the sample. And secondary data, it is collected from text books, researcher reports, and Internet. The researcher distributed the questionnaire to the respondents and waited for their inquiry in case they do not understand. After it was returned, I act as the researcher, checked it

2243

to find the errors and incomplete data and asked those respondents to complete it again.

Therefore, 400 questionnaires were completed and analyzed.

Data Analysis

After I collected the primary data by distributing questionnaires throught the selected area, I have to interpret the data into the suitable from in order to tabulate and summarise the research results easily. I have coded each question and its results into the form of figures and put them into the computer program. As a result of the advancement of modern technology, there are many computer program; that can help the researchers to do the research more effectively. SPSS program is used for data collection and analysis. A systematic and objective method is followed throughout the data collection process to ensure high quality and reliability of the data researcher; bias is eliminated in the current study. To ensure further objectivity in the study, we have used computer assisted qualitative data ananlysis named SPSS program whose content analyzer software is used to analyze the questionnaire results from various consumers.

This research is based on the studies about the know edge, awareness, perception and opinion toward Mobile phone users in Bangkok. The steps of doing this study are as follows:

(1) An issue 400 sets of questionnaire either in Thai language and English, and distribute to simple groups that are randomly selected. The sample includes all gender(s), age, education level, and income level.

(2) Collect the questionnaire from respondents

(3) Record code into the questionnaire

(4) Summarize the data in order to input them to the computer

(5) Input data to SPSS software program for analyze the data

(6) Conclude the results and present them both in the tabular and graphical

format

Limitation on Research Study

In doing the research I am faced with certain limitations which are controllable

and uncontrollable.

Time Frame: As I am faced with time constraint to finish my research report

before the end of this semester, I am not able to devote more time for this project.

However, **I** put all my efforts in marking this report more accurate and meaningful.

Interviews Error : Since I am not a professional and experienced researcher, there

are bound to be errors in this research. As a result, I am not able to produce sufficient

and precise study of the deep root on E-mobile phone users' buying behavior. I hope

that I will be judged based on my effort and creativeness in completing the project.

Lack of cooperation from respondents: Because the topic of this research reaches

down to people who use E-mobile who are normally unique group of people, I have to

conduct interviews with groups of people, some of whom I know and some of whom

are complete strangers. Therefore, I did not get full cooperation from most of strangers,

Some of them were unwilling to take time out for interview and some answer them with

bias. As a result, I am faced with certain difficulty as in tabulating the responses.

Data processing: Analyzing errors resulted from editing and coding responses into

useful materials to draw up a conclusion to our research. As mentioned earlier, I

conducted 25 interviews of which some had difficulty in corresponding relevantly.

However, I was able to finally work things out and tabulate the results perfectly.

IV. RESEARCH FINDING

We collected the data by using the questionnaire to conduct the personal interview. The questionnaire is composed of 9 questions. Our target respondents are Internet users.

SPSS software was used to analyze the raw data got from the personal interview. The result of the survey can answer the statement of problem as follows:

Table 4.1. Gender.

sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	223	55.8	55.8	55.8
	female	177	44.3	44.3	100.0
	Total	400	100.0	100.0	
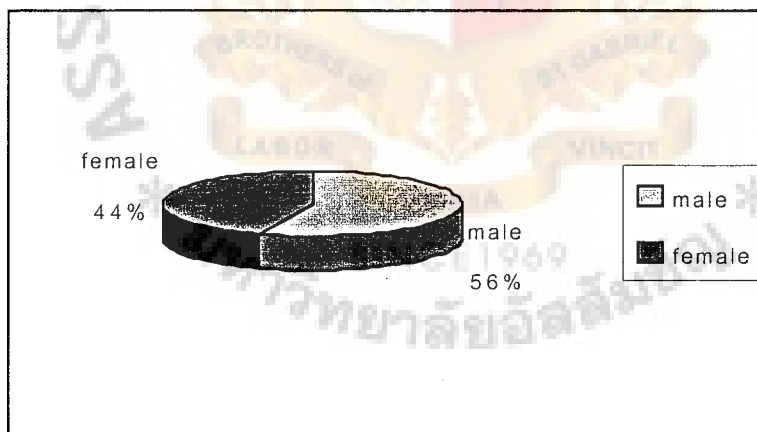
Figure 4.1. Gender.

From the research, we found that the proportion between male and female are 55.8% and 44.3% which means that the male respondents are more than female. Thus,

company's Wap site should provide the popular goods/services, which most of males like it on their Wap.

Table 4.2. Age.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	LOWER THAN 18 YEARS	11	2.75	2.75	2.75
	18-25 YEARS	194	48.5	48.5	51.25
	26-36 YEARS	166	41.5	41.5	92.75
	37-47 YEARS	29	7.25	7.25	100
	Total	400	100	100	
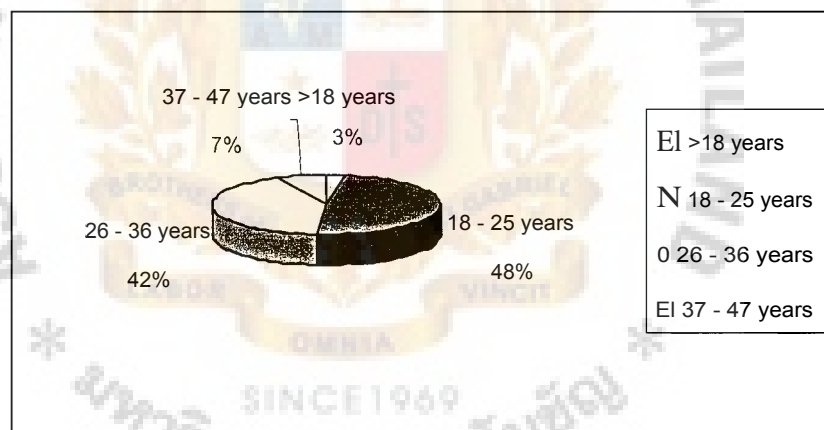
Figure 4.2. Age.

From the research, we found that most respondents are aged between 18 —25 (48.5%), are 26 — 36 (41.5%), 37 — 47(7.25%), and lower than 18 (2.75%) years old respectively. We concluded that the most of Internet users around 18 — 25 years that are teenagers and they are looking for a new thing in their life. This generation is a target

market of all companies's Wap sites on M-commerce. They may advertise on television,

billboard in order to motivate this group.

Table 4.3. Education.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	LOWER THAN BACHELOR	34	8.5	8.5	8.5
	BACHELOR DEGREE	308	77	77	85.5
	MASTER DEGREE	55	13.75	13.75	99.25
	DOCTOR	3	0.75	0.75	100
	Total	400	100	100	
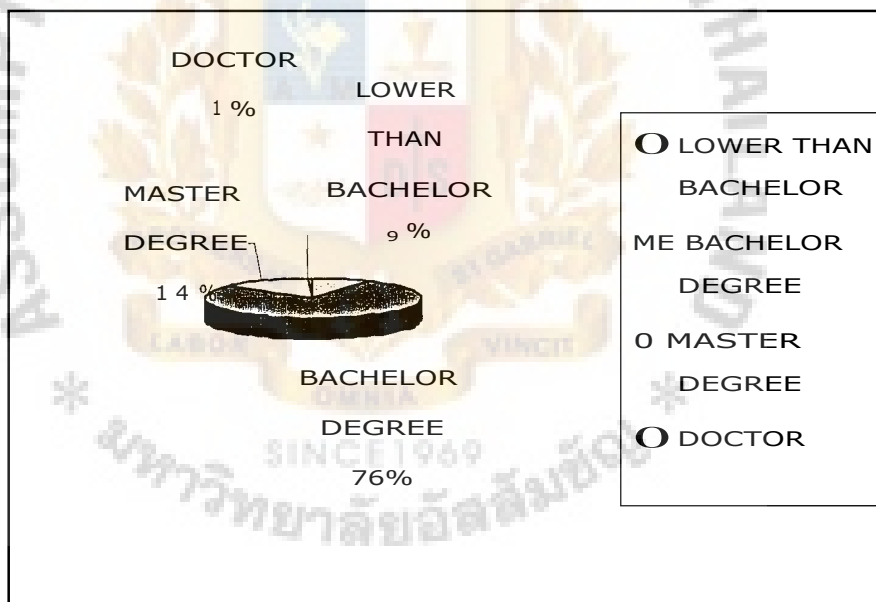
Figure 4.3. Education.

From the research, we found that most respondents have Bachelor Degree

(76%), Master Degree (14%), lower than bachelor (9%) and Doctor (1%). We

concluded that the most Internet users are studying for Bachelor Degree; so company's

Wap sites should provide more information about product categories, web site

15

infon_iation, education or any research for their reference and etc. If you can provide

good information, Internet users will join your Wap sites.

Table 4.4. How Often Do They Use M-Commerce.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	LESS THAN 1 TIMES/WEEK	31	7.75	7.75	7.75
	1-3 TIMES/WEEK	150	37.5	37.5	45.25
	4-6 TIMES/WEEK	112	28	28	73.25
	MORE THAN 6 TIMES/WEEK	107	26.75	26.75	100
	Total	400	100	100	

Figure 4.4. Usage Rate per Week.

From my survey, we found that the most respondents use M-Commerce around 1

— 3 times/week (37.5%), 4 — 6 times/week (28%), more than 6 times/week (26.75%) and

lower than 1 time/week (7.75%). We conclude that company's Wap sites should

concentrate more on M-ICommerce users who connect Wap-site since 4 — more than 6

16

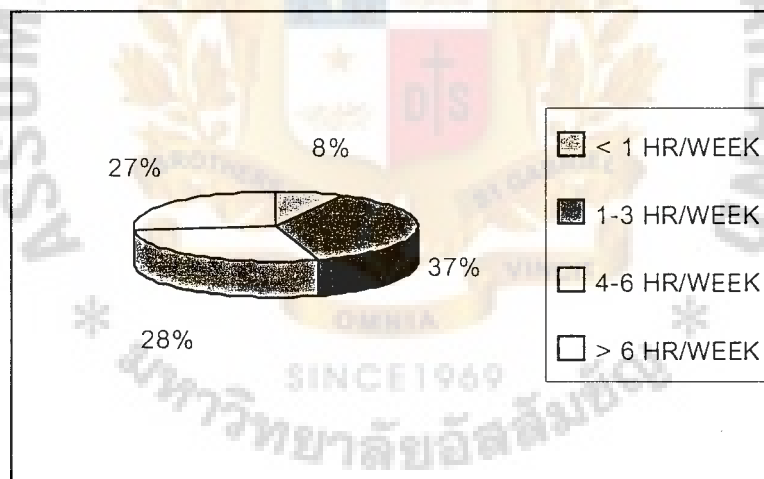times due to these groups is concentrate more on Internet and higher potential on M-commerce.

Table 4.5. Relationship of Gender with Connect Wap-sites Rate per Week.

	LESS THAN 1 TIMES/WEEK	1-3 TIMES/ WEEK	4-6 TIMES/ WEEK	MORE THAN 6 TIMES/WEEK
male	19	69	54	81
female	12	81	58	26
%	7.75%	37.50%	28%	26.75%

From the survey, we found that the most males (20.25%) connect Wap-site more than 6 times/week and females (20.25%) connect Wap-sites 1 — 3 times/week. We concluded that Wap-site company's web sites should emphases on males and females that use Internet higher than 4 — 6 times/week and they may join many activities such as information search, and download. Not only check E-Massage.

Table 4.6 Relationship of Gender with How Often Do They Using M-Commerce.

		LESS THAN 1 TIME /WEEK	1-3 TIMES/WEE K	4-6 TIMES/ WEEK	MORE THAN 6 TIME/WEEK
sex	male	19	69	54	81
	female	12	81	58	26
	%	7.75%	37.50%	28%	26.75%

From my survey, we found that the most respondents use M-commerce around 1 — 3 times/week (38%), 4 — 6 times/week (28%), more than 6 times/week (26.8%) and lower than 1 times/week (7.8%). We conclude that company's Wap sites should concentrate more on Wap users who uses M-Commerce more than 4 — 6 times due these group is concentrate more on Wab and higher potential on M-commerce

Table 4.7. Relationship of Education with How Often Using M-Commerce per Week.

		LOWER THAN BACHELOR	BACHELOR DEGREE	MASTER DEGREE	DOCTOR	Total
X2	LESS THAN 1 TIME/WEEK	1	30	0	0	31
	1-3 TIMES/WEEK	13	106	31	0	150
	4-6 TIMES/WEEK	7	95	10	0	112
	MORE THAN 6 TIMES/WEEK	13	77	14	3	107
Total		34	308	55	3	400
%		8.5	77	13.75	0.75	100

From the survey, we found that the most respondents are Bachelor Degree (26.5%) and Master Degree (7.75%) connect Wap-sites 1 — 3 times/week. We conclude that company's Wap-sites should convince M-commerce users who are Bachelor Degree use Wap-site service 1 — 3 times/week to spend more time on connecting Wap-site. Because if they spend more time on Wap-Site, company's Wap sites have more advantage due to Wap-Sites users may visit shopping page and buy or get more information.

Table 4.8. Use Mobile Phone Only to Call Some Body and Receive Call.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	316	79	79	79
	NO	84	21	21	100
	Total	400	100	100	
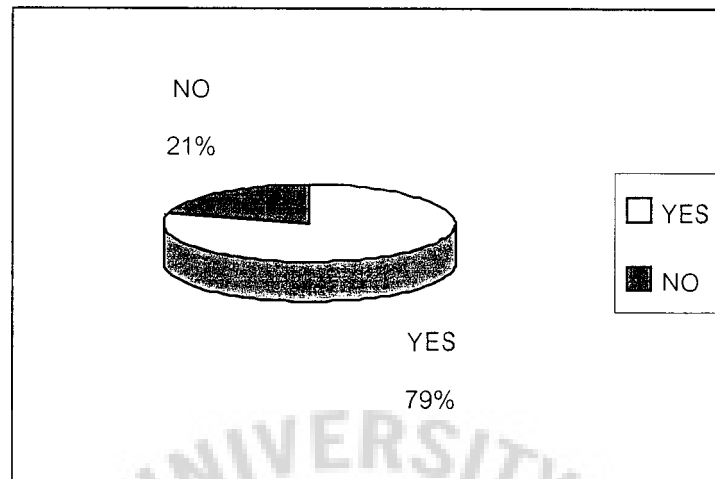
Figure 4.6. Use Mobile Phone Only to Call Somebody and Receive Call.

From the survey, we found that the most Wap-sites visitor know M-commerce (79%) and have known M-commerce (21%). It show that the information of Mobile Phone Companies are lower the standard of advertising due to there are 21% of respondents don't know M-commerce. Thus, The Mobile Phone Company should improve and provide more information to Mobile phone users.

Table 4.9. Relationship of Gender with How Often Using M-Commerce per Week.

		male	Female	Total
	YES	180	136	316
	NO	43	41	84
Total		223	177	400
		55.75	44.25	100

From the survey, we found that the most males (45%) and females (34%) know the electronic Mobile Phone. We concluded that female have fewer awareness on M-commerce than males and The Mobile Phone company should provide more

19

information on M-commerce with males and motivate female group and motivate them to try to connect Wap-sites due to buying behavior of females like to buy goods/service more than male.

In considering the relationship between gender and awareness of respondents, we have done a hypothesis testing using chi-square which is a test of independence by giving alpha = 0.05. This is a significance level that means the probability of making an erroneous decision when Ho is true will be less than 5 times in 100. The hypothesis is constructed as below:

Ho: Gender and awareness of respondents on M-commerce are independent.

Ha: Gender and awareness of respondents on M-commerce are not independent.

The results showed by using SPSS, We got a result of Pearson Chi-square in which significance is determined statistically in the analysis of crosstabs. The result showed Chi-square value 0.896, degree of freedom (d.f.) = 1 refers to the number of observation that can be varied without changing the constraints or assumption associated with a numerical system, and Significance = .344. To interpret the level of significance, Ho will be rejected if significance level is less than or equal .05 given and will not be rejected if significance level is more than .05. In this testing, significance level is more than alpha, then it accepts Ho. We concluded that sex and awareness of respondents on E-commerce have been related at significance level .05.

Table 4.10. Relationship of Age with How Often Using M-Commerce per Week.

	LOWER THAN 18 YEARS	18-25 YEARS	26-36 YEARS	37-47 YEARS	Total
YES	7	156	124	29	316
NO	4	38	42	0	84
Total	11	194	166	29	400
	2.75	48.5	41.5	7.25	100

From the survey, we found that most respondents lower than 18 years (1.75%), 18 — 25 years (39%), 26 — 36 years (31%) and 37-47 years (7.25%) know the Electronic Mobile. We conclude that company's Wap sites should emphasize on teenager group to 36 years due to these group have more knowledge and potential to buy goods/service such as buy Movie ticket, Air Plane ticket.

However, the hypothesis test is conducted to see the relationship between age and How often using M-Commerce per week

respondent on Giving alpha = .05 and construct hypothesis that:

Ho: Age and How often using M-Commerce per week of respondents on E-commerce are independent.

Ha: Age and awareness How often using M-Commerce per week of respondents on E-commerce are not independent

The result showed using SPSS, we got a result of Pearson Chi-Square that value = 11.358, d.f. = 3, significance = .010. The significance level less than alpha (.05) then reject Ho. We concluded that age and awareness of respondents on E-commerce are not related at significance .05.

Table 4.11. Relationship of Gender with Send and Receive Messages.

	male	female	Total
MOST INTEREST	30	21	51
INTEREST	41	33	74
FAIR	104	63	167
NOT QUITE INTEREST	30	44	74
NOT INTEREST	18	16	34
Total	223	177	400
%	55.75	44.25	100

From the survey, we found that most males (26%) and females (15.75%) are fair in sending and receiving messages. We concluded that male is more interested in sending message activities when they use mobile phone.

To test the independent hypothesis testing is conducted to see the relationship between respondent's gender and respondents who send message through mobile phone. In this test alpha = .05 is given and hypothesis are specified as below:

Ho: Gender and respondents who send and receive messages are independent.

Ha: Gender and respondents who send and receive messages are not independent.

The result showed using SPSS, we got a result of Pearson Chi-Square that value = 10.129, d.f. = 4, significance = .0038. The significance level less than alpha (.05) then reject Ho. We concluded that Gender and respondents who send and receive messages are not related at significance .05.

22

Table 4.12. Relationship of Education with Respondents Who Send and Receive Message.

	LOWER THAN BACHELOR	BACHELOR DEGREE	MASTER DEGREE	DOCTOR	Total
MOST INTEREST	1	49	1	0	51
INTEREST	8	52	14	0	74
FAIR	19	127	18	3	167
NOT QUITE INTEREST	6	57	11	0	74
NOT INTEREST	0	23	11	0	34
Total	34	308	55	3	400
%	8.5	77	13.75	0.75	100

From the survey, we found that most respondents lower than Bachelor Degree (4.75%), Bachelor Degree (31.75%), Master Degree (4.5%) and Doctor (0.75%) have fair interest. We concluded that most Internet users whose education Bachelor Degree are most interested than other education levels.

To test the independence, hypothesis testing is conducted to see the relationship between education and respondents who send and receive message through mobile phone. In this test alpha = .05 is given and hypothesis are specified as below:

Ho: Education and respondents who send and receive message through mobile phone are dependent.

Ha: Education and respondents who send and receive message through mobile phone are not independent.

From the result using SPSS, showed a result of Pearson Chi-Square that value = 32.288, d.f. = 12, significance = .002. The significance level less than alpha (.05) then

23

reject Ho. We concluded that education and respondents who send and receive message through mobile phone are not related at significance .05.

Table 4.13. Relationship of Gender with Information Searching.

	male	female	Total
MOST INTEREST	100	33	133
INTEREST	101	127	228
FAIR	22	15	37
NOT QUITE INTEREST	0	2	2
Total	223	177	400
%	55.75	44.25	100

From the survey, we found that most males (25.25%) and females (31.75%) are interested in information searching. We concluded that male and female spend more time about information searching which gives them many information such as movies information, stock price, air plane schedule, movies charts. It mean that nowadays people are in rush hour so they want any kind of service which makes them comfortable.

To test the independence, hypothesis testing is conducted to see the relationship between gender and respondents who search information through mobile phone. In this test alpha = .05 is given and hypothesis are specific as below:

Ho: Gender and respondents who search information through mobile phone are independent.

Ha: Gender and respondents who search information through mobile phone are not independent.

The result showed using SPSS, we got a result of Pearson Chi-Square that value = 20.645, d.f. = 9, significance = .014. The significance level less than alpha (.05) then

reject Ho. We concluded that gender and respondents who search information through mobile phone are not been related at significance .05.

Table 4.14. Relationship of Age with Searching Information through Mobile Phone.

	LOWER THAN 18 YEARS	18-25 YEARS	26-36 YEARS	37-47 YEARS	Total
MOST INTEREST	5	71	42	15	133
INTEREST	6	99	109	14	228
FAIR	0	22	15	0	37
NOT QUITE INTEREST	0	2	0	0	2
Total	11	194	166	29	400
%	2.75	48.5	41.5	7.25	100

From the survey, we found that most respondents lower than 18 years (1.5%), 18 — 25 years (24.75%) and 26 — 36 years (27.25%) are interested in information searching. However, 37-47 years (3.75%) are most interested in information searching. We concluded that mobile phone users whose age is 18 — 36 years are attentive in this activity which give more advantage than others who don't use mobile to search some information such as movies information, stock price, air plane schedule, movies chart.

To test the independence, hypothesis testing is conducted to see the relationship between respondent's age and respondents who search information on M-Commerce. In this test alpha = .05 is given and hypothesis are specific as below:

Ho: Age and respondents who search information through mobile phone are independent.

Ha: Age and respondents who search information through mobile phone are not independent.

The result showed using SPSS, we got a result of Pearson Chi-Square that value = 17.823, d.f. = 9, significance = .037. The significance level less than alpha (.05) then reject Ho. We concluded that age and respondents who search information through mobile phone are not related at significance .05.

Table 4.15. Relationship of Gender with Shopping.

		male	female	Total
	MOST INTEREST	0	2	2
	INTEREST	30	27	57
	FAIR	65	45	110
	NOT QUITE INTEREST	72	41	113
	NOT INTEREST	56	62	118
Total		223	177	400
%		55.75	44.25	100

From the survey, we found that most of males (18%) are quite interested and females (15.50%) not interested in shopping. We concluded that female is not interested than male in shopping on Internet so Mobile phone company should convince females to buy goods/service through Wap-sites due to female's purchasing behavior like to shop and buy goods/service more than male.

To test the independence, hypothesis testing is conducted to see the relationship between respondent's sex and respondents who are interested in buying goods/service through Wap-sites. In this test alpha = .05 is given and hypothesis are specified as below:

Ho: Gender and respondents who are interested in buying goods/service through Wap sites are independent.

Ha: Sex and respondents who are interested in buying goods/service through Wap-sites are not independent.

The result showed using SPSS, we got a result of Pearson Chi-Square that value = 9.439, di. = 4, significance = .051. The significance level more than alpha (.05) then not reject Ho. We concluded that sex and respondents who are interested in buying goods/service through Wap-sites are related at significance .05.

Table 4.16. Relationship of Education with Paying Point service.

	LOWER THAN BACHELOR	BACHELOR DEGREE	MASTER DEGREE	DOCTOR	Total
MOST INTEREST	8	105	22	3	138
INTEREST	13	100	19	0	132
FAIR	10	81	7	0	98
NOT QUITE INTEREST	0	16	0	0	16
NOT INTEREST	3	6	7	0	16
Total	34	308	55	3	400
%	8.5	77	13.75	0.75	100

From the survey, we found that most respondents lower than Bachelor Degree (3.25%) are interested in paying monthly payment through paying point service. Bachelor Degree (26.25%), Master Degree (5.50%) and Doctor (0.75%) are most interested in paying monthly payment through paying point service. We concluded that M-Commerce users are educated Bachelor Degree are more interested on paying monthly payment through paying point service which shows that now, teenagers group

27

is more interested in new technology because it is comfortable to them and save the time consumed.

To test the independence, hypothesis testing is conducted to see the relationship between respondent's education and paying monthly payment through paying point service. In this test alpha = .05 is given and hypothesis are specified as below:

Ho: Education and respondents who paying monthly payment through paying point service are independent.

Ha: Education and respondents who paying monthly payment through paying point service are not independent.

The result showed using SPSS, we got a result of Pearson Chi-Square that value = 31.932, d.f. = 12, significance = .001. The significance level less than alpha (.05) then reject Ho. We concluded that education and respondents who pay monthly payment through paying point service are not related at significance .05.

Table 4.17. Relationship of Age with Future Buying through M-Commerce.

	LOWER THAN 18 YEARS	18-25 YEARS	26-36 YEARS	37-47 YEARS	Total	%
X12 YES	7	90	48	16	161	40.25
NO	4	104	118	13	239	59.75
Total	11	194	166	29	400	100
	2.75	48.5	41.5	7.25	100	

From the survey, we found that most respondents lower than 18 years (1.75%) and 37-47 years (4%) use buy goods/service through M-commerce. However, 18 — 25 years (26%) and 26 — 36 years (29.50%) will not buy goods/service by M-commerce in the future. We concluded that the most of respondents who are teenagers- 37 years have

28

no plan to buy goods/service in the future so Wap master should provide more information and promotion activities for Mobile phone users and try to change their purchasing lifestyle.

To test the independence, hypothesis testing is conducted to see the relationship between age and respondents who have possibility to buy goods/service through mobile phone in the future. In this test alpha = .05 is given and hypothesis are specific as below:

Ho: Age and respondents who have possibility to buy goods/service through mobile phone in the future are independent.

Ha: Age and respondents who have possibility to buy goods/service through mobile phone in the future are not independent.

From the result showed using SPSS, we got a result of Pearson Chi-Square that value = 17.097, d.f. = 3, significance = .001. The significance level less than alpha (.05) then reject Ho. We concluded that income and respondents who have possibility to buy goods/service through mobile phone in the future are not related at significance .05.

Table 4.18. Searching Information.

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid MOST INTEREST	6	1.5	1.5	1.5
INTEREST	32	8	8	9.5
FAIR	126	31.5	31.5	41
NOT QUITE INTEREST	178	44.5	44.5	85.5
NOT INTEREST	58	14.5	14.5	100
Total	400	100	100	

29

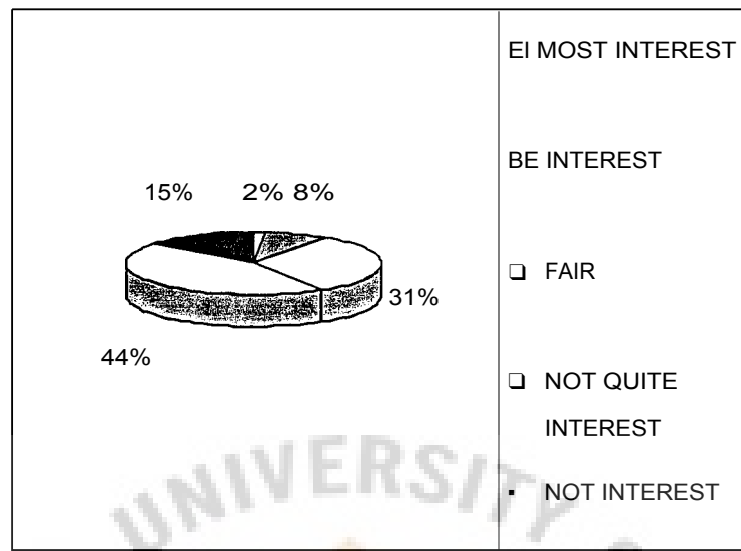| | El MOST INTEREST |
	BE INTEREST
	❏ FAIR
	❏ NOT QUITE INTEREST
	▪ NOT INTEREST

Figure 4.18. Information Searching.

From survey, we found that respondents (44%) are not quite interested, (31%) are fair, (15%) are not interested, (8%) are most interested and there are only (2%) most interested on searching information. We concluded that most respondents do not pay more attention to this activity on M-Commerce.

Tab1e4.19. Sending E-Message.

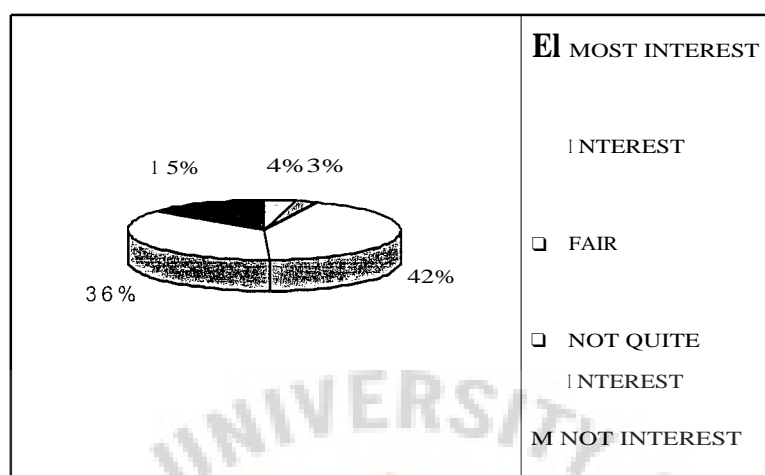|	Frequency	Percent	Valid Percent	Cumulative Percent
Valid MOST INTEREST	14	3.5	3.5	3.5
INTEREST	12	3	3	6.5
FAIR	172	43	43	49.5
NOT QUITE INTEREST	144	36	36	85.5
NOT INTEREST	58	14.5	14.5	100
Total	400	100	100	

Figure 4.19. Sending E-Message.

From survey, we found that (42%) are fair, (36%) are not quite interested, (15%) are not interested. There are (4%) most interested and (3%) are interested on E-message. We concluded that most respondents are fair on this activity which shows that Mobile phone users like to use this activity.

Table 4.20. Download Music and Picture.

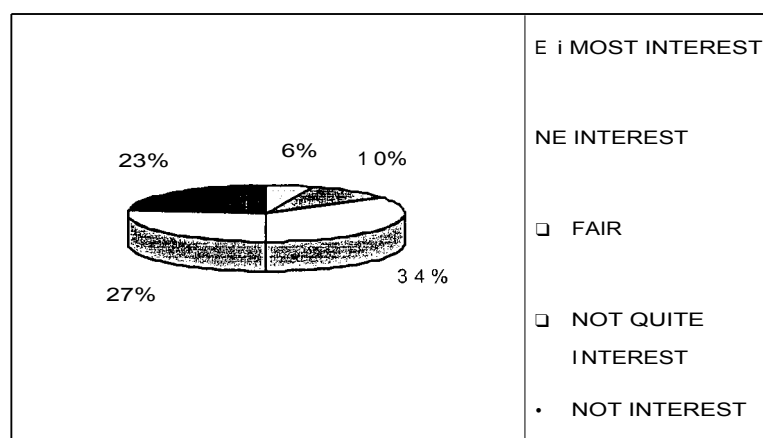|	Frequency	Percent	Valid Percent	Cumulative Percent
Valid MOST INTEREST	22	5.5	5.5	5.5
INTEREST	40	10	10	15.5
FAIR	138	34.5	34.5	50
NOT QUITE INTEREST	108	27	27	77
NOT INTEREST	92	23	23	100
Total	400	100	100	

31

Figure 4.19. Download Music and Picture.

From the survey, we found that most respondents (34%) are fair, (27%) are not quite interested, (23%) are not interested. There are (6%) are most interested and (10%) are interested on Paying Service. We conclude that most respondents like to pay for download service through the M-Commerce service.

Table 4.21. Paying Point Service.

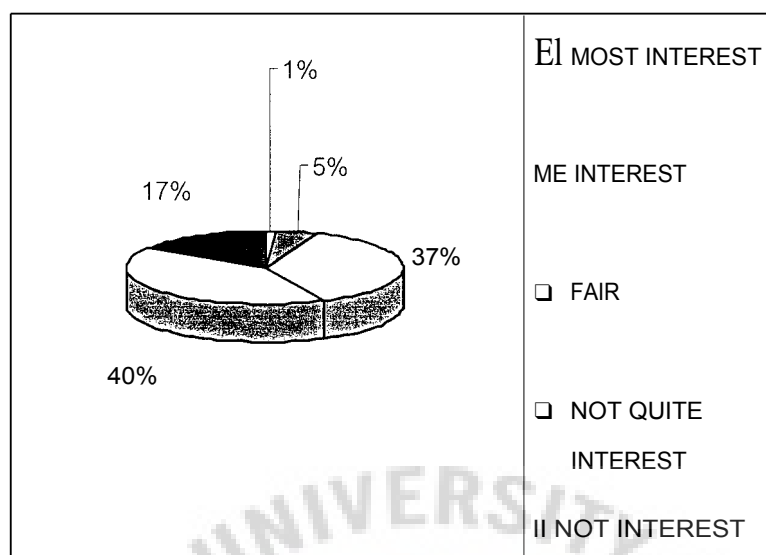|	Frequency	Percent	Valid Percent	Cumulative Percent
Valid MOST INTEREST	4	1	1	1
INTEREST	20	5	5	6
FAIR	148	37	37	43
QUIET INTEREST	162	40.5	40.5	83.5
NOT INTEREST	66	16.5	16.5	100
Total	400	100	100	

Figure 4.20. Paying Point Service.

From the survey, we found that most respondents (40%) are not interested, (37%) are fair, (17%) are not interested, and there are (1%) most interested and (5%) are interested on Paying Point Service. We concluded that most of respondents are not quite interested on Paying Point Service.

Table 4.22. Shopping M-Commerce.

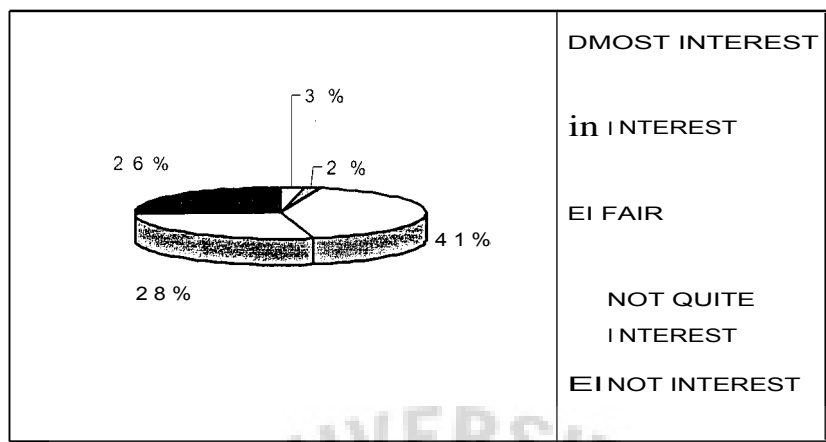|	Frequency	Percent	Valid Percent	Cumulative Percent
Valid MOST INTEREST	10	2.5	2.5	2.5
INTEREST	8	2	2	4.5
FAIR	168	42	42	46.5
NOT QUITE INTEREST	110	27.5	27.5	74
NOT INTEREST	104	26	26	100
Total	400	100	100	

Figure 4.22. Shopping.

Most respondent (28%) are not quite interested, (26%) are not interested, (41%) are fair and there are (3%) most interested on shopping and (2%) are interested on shopping. We conclude that most respondents do not pay more attention on this activity so Wap sites company should motivate M-Commerce users to join this activity.

Table 4.23. Relation Age and Satisfaction of Respondant in Internet Service.

		LOWER THAN 18 YEARS	18-25 YEARS	26-36 YEARS	37-47 YEARS	Total
X8	UNSATISFY	4	7	13	2	26
	FAIR	1	28	7	5	41
	SATISFY		12		9	21
Total		5	47	20	16	88
		5.68	53.4	22.72	18.18	100

34

From the survey, we found that most respondents lower than 18 years (4.54%) and 26 — 36 years (3.25%) are unsatisfied with M-commerce service, 18 — 25 years (7%) are fair with -commerce service. However, 37-47 years (10.22%) are satisfied M-commerce service. We concluded that the standard of goods/service on M-Commerce is still low due to there are 28.55% unsatisfied. Therefore, company's Wap-sites should improve their goods/service such as more information about product categories, advertising, discount.

Table 4.24. The Level of Satisfaction of M-Commerce.

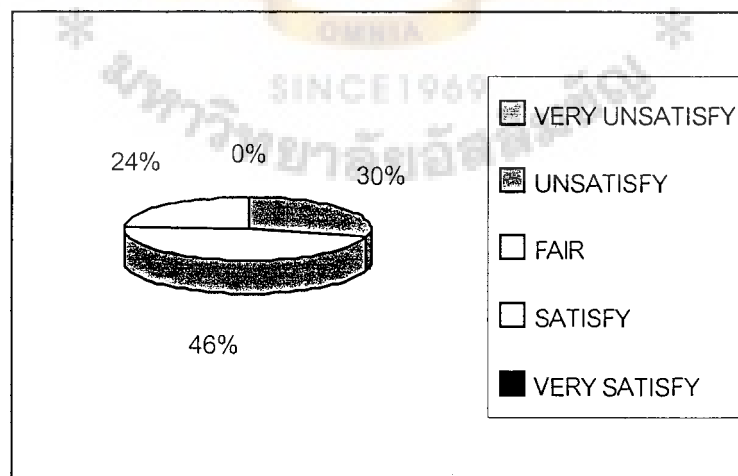|		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	UNSATISFY	26	6.5	29.55	29.55
	FAIR	41	10.25	46.59	76.14
	SATISFY	21	5.25	23.86	100.00
	Total	88	22	100	
Missing System		312	78		
Total		400	100		

Figure 4.13. Respondents' Satisfaction on M-Commerce Service.

From the survey, we found that most of respondents (46%) are fair on M-commerce service, (24%) are satisfied. However, there are (30%) are not satisfied on M-commerce service. Thus, company's web sites should improve their service, quality of products in order to motivate M-Commerce buyer to buy the products on M-commerce.

Table 4.25. The Kind of Service Do Respondants Want from Mobile Phone.

X12

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Search	161	40.3	40.3	40.3
	Receive	239	59.8	59.8	100.0
	Total	400	100.0	100.0	

From survey, We found that most of respondants want Mobile Phone Company to provide more information (60%), they want to search/buy more products (40%).We conclude that the respondents are care more about receiving information from Mobile Phone Company and Wap-Sites Company.

Table 4.26. Descriptive Statistics Reflecting the Results of Respondents' Interest on Internet.

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Fig 4.8	400	1	5	3.725	0.955	0.912
Fig 4.9	400	1	5	3.55	0.900	0.810
Fig 4.10	400	1	5	3.52	1.115	1.243
Fig 4.11	400	1	5	3.665	0.845	0.715
Fig 4.12	400	1	5	3.625	0.881	0.776

The values of Table 4.23. show the mean or average of respondents' answer in Figure 4.7 To 4.12. Please refer also, for more details in question number 4, to Appendix A or B. Variance and Standard deviation in the table above shows the spread or dispersion of data from the average. Variable will be close to zero if the observation in the distribution is the same as the mean and it will be large if the observations tend to differ increasingly from the mean. Standard deviation shows variability of the distribution or broad of data from the mean.

Questionnaire Reliability Analysis

Toward the survey conducted and all questions asked to respondents, we have analyzed the reliability from the activities of respondents are interested on Internet.

Table 4.27. Reliability Analysis.

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
Fig 4.8	18.075	8.7312	0.6025	0.6618
Fig 4.9	18.25	11.4862	0.1225	0.7918
Fig 4.10	18.28	8.6232	0.4852	0.7025
Fig 4.11	18.135	9.3903	0.5671	0.6769
Fig 4.12	18.175	9.057	0.6052	0.6643

For chat, reliability of question has alpha equal to 0.6887, shopping equal to 0.6618, E-mail equal to 0.7918, game equal to 0.7025, download equal to 0.6769, and searching information equal to 0.6643. This result is also close to 1.0, then reliability of the tool used in this survey is high

From the above reliability coefficients, shows the level of confidence in the tool that we used in the survey to see that how much confidence these data pertained. The explanations are as below:

Number of cases　　　　=　　Number of respondents (400 respondents)

Number of items show =　　Number of question used in analyzing

Alpha　　　　　　　　　=　　Level of confident in the tool

For the total level of confidence in the tool is 0.7381 and we can state that the level of confidence in the tool of this survey is high.

Summary of Analysis

Form my research, we found that now, most respondents use Internet around 1 — 3 hours/week (Q2) and they are male, age around 18 — 25 years, Bachelor Degree . They know electronic Mobile Phone only (79%) which show that there are few Mobile users who do not know Mobile commerce.

From my observation, most of Wap-sites visiters are most interested in the follow levels of these activities Q6:

Shopping: we found that (41%) are fair, (28%) are not interested, (26%) are not interested. (3%) are most interested in shopping on Internet.

(1)　　E-mail: most respondents (42%) are fair, (36%) are not quite interested, (15%) are not interest, (3%) are interested and (4%) are most interested on E-mail.

(2)　　Download: most respondents (34%) are fair, (27%) are not quite interested, (23%) are not interested, (10%) are interested, and there are (6%) most interested on download.

(3)   Paying Point Service: most respondents (40%) are not quite interested, (37%) are fair, (17%) are not interested, (5%) are fair and there are only (1%) most interested on paying point service.

(4)   Information searching: Most respondent (44%) are not quite interested, (31%) are fair, (15%) are not interested, (8%) are interested and there are only (2%) most interested on searching information.

My research found that they know M-commerce (79%). The other Internet users who do not buy goods/service on Mobile Commerce because they do not know about the provided information from Mobile Phone Company (Q8). From survey, We found that most respondents want Mobile Phone Company to provide more information (60%), they want to search/buy more product (40%).We conclude that the respondents care more about receiving information from Mobile Phone Company and Wap-Sites Company.

Thus, if government, mobile phone company, wapsite company want to increase customer satisfaction, high product/service volume usage and convince mobile phone user who never visit or are unsatisfied with the provided information from company,the Wap-site company or mobile phone company have to provide more information to mobile phone user.

APPENDIX A

QUESTIONNAIRE (IN ENGLISH)

My name is Sirichan S, studying Master Degree at Assumption University in Computer Engineering Management Program and I am doing a project required by the program "A study of M-Commerce usage among university students in Bangkok" Please help me by filling out this questionnaire and return it to me as soon as possible.

1. Gender
   _____ Male   _____ Female

2. How old are you?
   _____ Under 18 years old   18-25 years old
   _____ 26-36 years old   37-47 years old
   _____ Over 47 years old

3. What level of education are you presently studying for?
   _____ Lower than Bachelor
   _____ Bachelor degree
   _____ Master degree
   _____ Doctor Degree

4. How long have you been using mobile phone?
   _____ Less than 1 year
   _____ 1- 2 Years
   _____ 3- 4 Years
   _____ More than 5 years

5. Do you use mobile phone only to call somebody and receive calls?
   _____ Yes (Questionnaire Finished)
   _____ No

6. What else do you use your mobile phone for? (Please mark service you interest

	Most interest	Interest	Fair	Not Quite Interest	Not interest
Information searching					
E-Message					

Download					
Pay Point Servoce					
Shoping (E-Commerce)					

7. How often do you use M-commerce per week through mobile phone?

    _____ Less than once/week   _____ 1-6 times/week

    _____ once/day   _____ More than once/day

8. What other kinds of service do you want from mobile phone?

    _____ Search and buy more products

    _____ Receives more information & news

9. What is your level of satisfaction for the goods/service through mobile

    _____ Very unsatisfied

    _____ Unsatisfied

    _____ Fair

    _____ Satisfy

    _____ Very satisfied

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