Customer's Attitude towards Mobile Stock Service

by

Ms. Uthaivan Jaerakitivanich

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

July 2004

Customer's Attitude towards Mobile Stock Service

by
Ms. Uthaivan Jaerakitivanich

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

July 2004

Project Title	Customer's Attitude towards Mobile Stock Service
Name	Ms. Uthaivan Jaerakitivanich
Project Advisor	Dr. Thanatphong Pratheepthaweephon
Academic Year	July 2004

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.

Approval Committee:

T. Pratheepthaweephon

(Dr. Thanatphong Pratheepthaweephon)
Advisor

(Prof.Dr. Srisakdi Charmonman)
Chairman

Chamnong J.

(Dr. Chamnong Jungthirapanich)
Dean and Co-advisor

(Assoc.Prof. Somchai Thayarnyong)
CHE Representative

July 2004

ABSTRACT

The project is a descriptive research determined by qualitative data to serve the main purpose of evaluating the customer's attitude towards Mobile Stock Service. The survey under the topic of "Customer's attitude toward Mobile Stock Service" will be identified as useful guidance for mobile developers to improve the service area of applications regarding to objectives and the scope of study. It will determine the success and the possibilities of providing services in the future as well.

The information in this research is gathered by two sources, primary sources and secondary sources. It surveys the primary research by collecting data from questionnaire that distributed to 381 respondents who are stock investors in Thailand who use mobile stock service. The secondary source is obtained from the literature search such as Internet, Library, and so on. The result of data analysis will be generated by SPSS/PC software.

Most respondents prefer to view stock information rather than trade the stock via their mobile phones. This service seems to reach its objective because the customers think that they receive the accuracy stock information in real-time from stock exchange of Thailand. Also, they believe that the mobile phones can provide them more convenience in viewing the stock information and trading stock.

ACKNOWLEDGEMENT

Several people have made contributions to this project. The writer would like to acknowledge their efforts and thank them for their contributions.

I would like to thank Dr. Thanatphong Pratheepthaweephon, her project advisor, for his valuable suggestions and advice given the preparation of this project.

The author extends her sincere thanks to Mrs. Usa Roonrojkarnka, Miss Orawan Jaerakitivanich, and Miss Umaporn Jaerakitivanich for their consultation in marketing strategy, research process and methodology, and any information while carrying out the data collection required for her project.

Finally, the author would like to thank indeed to all respondents who spend free time to answer her questionnaires.

TABLE OF CONTENTS

Chapter			Page
ABSTRACT			i
ACKNOWLEGEMENTS			ii
LIST OF FIGURES			v
LIST OF TABLES			vi
I.	INTRODUCTION		1
	1.1	Background of the Study	1
	1.2	Importance of the Study	2
	1.3	Objectives of the Study	3
	1.4	Statement of the Problems	3
	1.5	Research Methodology	3
	1.6	The Project Criteria	4
	1.7	Definition of Terms	4
II.	LITERATURE REVIEW		6
	2.1	Overview of Mobile Stock Service	6
	2.2	Attitudes of Customers	12
	2.3	Research Process	17
III.	RESEARCH METHODOLOGY		26
	3.1	Research Methodology	26
	3.2	Research Sample	26
	3.3	Data Collection	29
	3.4	Data Analysis	31
IV.	DATA ANALYSIS		34

Chapter			Page
	4.1	Personal Profile	34
	4.2	Customer's Attitude towards Mobile Stock Service	41
	4.3	Customer's Attitude Based on Dimensions of Service Quality	45
	4.4	Factors Influencing Services Implementation	47
	4.5	Deduction from Independent Sample T-Test	49
V.	CONCLUSIONS AND RECOMMENDATIONS		56
	5.1	Research Summary	57
	5.2	Conclusion of findings	58
	5.3	Recommendations	59
APPENDIX A		OUTPUT OF SPSS PROGRAM	61
BIBLIOGRAPHY			79

LIST OF FIGURES

Figure		Page
2.1	Steps between Evaluation of Alternatives and a Purchase Decision	14
2.2	Summary of the Characteristics for Levels of Measurement	22
4.1	Gender of Respondents	34
4.2	Age of Respondents	35
4.3	Education Level of Respondents	35
4.4	Occupation of Respondents	36
4.5	Monthly Income of Respondents	36
4.6	Respondents Who View the Stock Information via Mobile Phone	37
4.7	Respondents Who Trade Stock via Mobile Phone	38
4.8	Promotion that Respondents Prefer	38
4.9	The Customer's Behavior Pattern in Viewing the Stock Information VS Income per Month	39
4.10	Sex VS Promotion	40
4.11	Age VS Promotion	40
4.12	Mean Values of Factors in Agree Level	43
4.13	Mean Values of Factors in Neutral Level	44
4.14	Means of Consumer's Perception Based on Quality Dimensions	46
4.15	Means Comparisons of Reputation Factor	47
4.16	Means Comparisons of Serviceability Factor	47

LIST OF TABLES

Table		Page
2.1	The Dimensions of Quality for Products & Service	16
3.1	Required Sample Size in Given Population	28
4.1	Mean Evaluation for General Perceptions	41
4.2	Factor Analysis of Selected 14 Items	48
4.3	Means of Relating Factors	49
4.4	T-Test of Customer's Attitude of Quality Dimensions between People Aged 15-34 and People Aged 35 and upward.	50
4.5	T-Test of Customer's Attitude of Quality Dimensions between People Who View the Stock Information via SMS and Those Who View the Stock Information via WAP or GPRS.	51
4.6	T-Test of Customer's Attitude of Quality Dimensions between Those Who Trade Stock via Mobile Phone and Those Who Have not.	53
A.1	Frequency Table-Personal Information	65
A.2	Frequency Table-Attitudes Towards Mobile Stock Service	66
A.3	Crosstabulation	70
A.4	Descriptive-Means among 14 Variables	72
A.5	Factor Analysis	73
A.6	T-Test: Trade Stock Via Mobile Phone VS Quality Dimensions	76
A.7	T-Test: View Stock Information Via Mobile Phone VS Quality Dimensions	77
A.8.	T-Test: Age VS Quality Dimensions	78

I. INTRODUCTION

1.1 Background of the Study

According to the increasing number of mobile users in Thailand resulted from the decreasing price of mobile devices, as well as the behavior of mobile users who tend to use more non-voice service because of the well-supported of WAP/GPRS service, many mobile developers see this opportunity to develop many mobile application services such as game, ring tone, MMS, and so on.

At present, the stock market is very attractive to invest because of the low interest rate of bank so that the people find way to increase their value of money. The stock investors require the accuracy and real-time stock information in order to help them make the decision in stock trading easier. Therefore, mobile developers have proposed the new way for stock investors to use their mobile phones as virtual stock exchange which is called "Mobile Stock Service".

Mobile Stock service is the stock information service and trading stock service via mobile phone. The mobile users can enable their mobile phones to act as "broker" that can alert about stock performance, receiving data in forms of texts, graphs, charts, and display in REAL-TIME from Stock Exchange of Thailand's PRS (Price Reporting System). Also, it provides the virtual stock trading room for stock investors to buy and sell the stock anywhere anytime.

There are two main companies in Thailand, M.F.S. Enterprise Company Limited and Settrade.com, who have developed the mobile stock application service. The technologies used for developing are SMS technology, JAVA/C++ technology for mobile phones which can support WAP/GPRS service. The phone supporting SMS service should provide the stock information such as SET, SET50index, Market Active,

Top Gainers, Top Losers, Stock Quote, Sector Quote, and so on. The phone supporting WAP/GPRS and JAVA/C++ service should provide the stock information such as Stock Watch, Stock Ticker, Stock Info, Market Active, News, Virtual Portfolio, Stock Alert, and so on. The stock investors who use mobile phones in supporting JAVA and WAP/GPRS service will be able to buy and sell the stock via their mobile phone as well.

An attitude of the customers is usually viewed as an enduring disposition to respond consistently in a given manner to various aspects of that objects. To be successful in the market, the company needs to develop their products which meet the common dimensions of quality in order to yield maximum satisfaction to their target customers. Thus, the customer's attitude toward the Mobile Stock Service is the important thing for the mobile developers to know in order to analyze which service area should be improved.

1.2 Importance of the Study

The survey under the topic of "Customer's attitude toward Mobile Stock Service" will be identified as useful guidance for mobile developers to improve the service area of applications regarding to objectives and the scope of the study. It will determine the success and the possibilities of providing services in the future as well.

The Mobile Stock Service provides benefit to both network operators and customers. The network operators can earn more revenue from this service and the customer can use their mobile phone as virtual stock market and virtual trading room anywhere anytime. It comes to the point that both network operators and customers will gain more benefits if the customers are satisfied with this service. The solution of this research will be used to consider the attitude of stock investors in Thailand towards Mobile Stock Service.

1.3 Objectives of the Study

(1) To find out the attitude of stock investors in Thailand towards Mobile Stock Service.

(2) To find out the factors those impact the stock investors in using Mobile Stock Service.

(3) To recommend the Mobile Stock application developer in order to improve the service so that they can satisfy the customer's need and wants.

1.4 Statement of the Problems

The project is the attitude survey of gathering the customer's attitude to answer these following statements:

(1) To what extent does the Mobile Stock Service succeed or fail?

(2) What factors are used to support the success or failure of the Mobile financial service?

(3) To what extent can the Mobile Stock Service satisfy the customer's need and wants?

1.5 Research Methodology

The project uses descriptive research to verify the current situation. Concepts of measuring consumer's perception are described as:

(1) Data Collection Methods: The results are gathered by the structure-undisguised questionnaire survey and using secondary data to support the study.

(2) Sampling Methods: Determining the sample size is based on Krejcie & Morgan (1970) and using purposive and convenience sampling method in distributing questionnaire.

(3) Data Analysis: Data are processed by SPSS/PC software and analyzed by descriptive statistics such as percentages, means, cross tabulation, and found other correspondences by factor analysis.

1.6 The Project Criteria

(1) The survey will strictly follow objectives of study.

(2) The research studies the Mobile Stock service.

(3) Population limits to the stock investor in Thailand who are 15 years and above living in Bangkok.

1.7 Definition of Terms

1.7.1 Project Terms

(a) The Mobile Stock Service: It is referred the service that provides the convenience for stock investors to view on-line stock information and trade stock via mobile phone.

(b) The Dimensions of Design Quality for Service (Chase, Aquilano, and Jacobs 1998); which are eight factors ensuring that the service possesses conformance quality consisting of Performance, Features, Reliability, Durability, Serviceability, Response, Aesthetics, and Reputation

(c) In this research, respondents are the current stock investors who are using Mobile Stock Service.

1.7.2 There are 13 Variables used to evaluate the consumer's attitude toward Mobile Stock Service

(a) Accuracy – To trust whether Mobile Stock Service provides the accurate stock information

(b) Promptness – To trust whether Mobile Stock Service provides the stock information from PRS at stock exchange of Thailand in REAL-TIME.

(c) Features – To think that the menu in the application is sufficient to support the decision making of stock investors.

(d) Reliability – To ensure that the applications can support the large number of users that access simultaneously.

(e) Durability – To think that it will still be compatible to their lifestyle in the future

(f) Serviceability – To trust that the customers can access any time of the day during stock market opens.

(g) Responsiveness – To trust that they will receive the prompt response upon requests to view the stock information

(h) Aesthetics – To ensure that the menu of the application is quite user-friendly

(i) Credibility – To enhance the confidence of customer in trading stock with broker whom service providers connect to

(j) Security – To feel safe to trade stock via mobile phone other than any ways with high security technology

(k) Convenience – To agree that mobile stock service can help the stock investors more convenience in viewing the stock information and trading stock

(l) Price – To agree that the price that the service providers and network operator are charging with reasonable price

(m) Service Charge – To consider that the commission charged by Broker is reasonable.

(n) Promotion – To consider that the promotion is one factor that can attract the customer to use the service more so that the network operators and service providers can increase sale force

II. LITERATURE REVIEW

2.1 Overview of Mobile Stock Service

2.1.1 Mobile Stock Service

Mobile Stock service is the stock information service and trading stock service via mobile phone. The mobile users can enable their mobile phones to act as "broker" that can alert about stock performance, receiving data in forms of texts, graphs, charts, and display in REAL-TIME from Stock Exchange of Thailand's PRS (Price Reporting System). Also, it provides the virtual stock trading room for stock investors to buy and sell the stock anywhere anytime.

Mobile Stock Service is a significant breakthrough because it benefit to the customer in monitoring and trading the stock in stock market via mobile phones. Investors no longer need to station in a trading room, in front of a TV set or tied to a computer screen to stay in touch with the market and conduct trades. The investors can review stock market news and information, send stock trading orders, monitor order status, look at their investment portfolio and view graphs covers historical data through wireless multimedia communications service or WAP/GPRS service.

All phones with SMS capability can receive the automatic REAL-TIME notification when selected stocks hit pre-set condition. The application can provide many ways to server customer's need in REAL-TIME. The customers can view the stock by name or by condition.

For the mobile phones with Java capability supported WAP/GPRS service, which allows investors go anywhere they want with the confidence that they can track the stock market in real time, receive up-to-date information and analytical reports and send trading order within seconds.

There are two main companies in Thailand, M.F.S. Enterprise Company Limited and Settrade.com Company Limited, developing the mobile stock application service. The technologies used for developing are SMS technology, JAVA/C++ technology for mobile phones that can support WAP/GPRS service. The phone supporting SMS service provides the stock information are such as SET, SET50index, Market Active, Top Gainers, Top Losers, Stock Quote, Sector Quote, and so on. The phone supporting WAP/GPRS and JAVA/C++ service can provide the stock information are such as Stock Watch, Stock Ticker, Stock info, Market Active, News, Virtual Portfolio, Stock Alert, and so on. The stock investors who use mobile phone supporting JAVA and WAP/GPRS service will be able to buy and sell the stock via their mobile phone as well.

2.1.2 M.F.S. Enterprise Company Limited

M.F.S Enterprise Co., Ltd is a group of professional experts in Information Technology and Financial Markets. The company groups together to create and build up a new realm of business and products aiming to serve the local market in Thailand by focusing on market innovation strong roadmap for the future, the changing lifestyle of the public and any niche market. The company is the leader in Financial Services Provider by mixing ideas and concepts of creativity, information technology, marketing, financial and banking knowledge, and behavior analysis.

M.F.S. Enterprise Co., Ltd provides a financial service called "MFS" (Mobile Financial Service), enabling the customers to set up their phone to act as your "broker", alerting about the stock performance, receiving data in forms of graphs, charts and displays in REAL TIME from Stock Exchange of Thailand's PRS (Price Reporting System).

M.F.S. Enterprise Co., Ltd has allied with both local and international strategic business as follows: Advanced Info Service, and DST International (Bangkok). Therefore, the phone that can support the application provided by the company is only mobile phone in AIS network.

There are 10 securities companies that co-operate in this service with M.F.S Enterprise Company Limited as follows:

(1) KIATNAKIN Securities Company Limited (KKS)

(2) FAREAST Securities Company Limited (FES)

(3) KIMENG Securities Public Company Limited (KIMENG)

(4) PHILIP Securities (Thailand) Public Company Limited (PHILIP)

(5) ZMICO Securities Public Company Limited (ZMICO)

(6) UNITED Securities Public Company Limited (UN)

(7) BFIT Securities Company Limited (BFITSEC)

(8) SYRUS Securities Company Limited (SYRUS)

(9) TRINITY Securities Company Limited (TRINITY)

(10) KRUNGSRI AYUTTHAYA Securities Company Limited (AYS)

2.1.3 Settrade.com Company Limited

Settrade.com is the sub-company of the stock market exchange of Thailand, founded in October 13, 2000 with a total registered capital of 80 million Baht. The company's vision and mission is to develop the stock market in Thailand by using the new technology to provide the stock information service and trading stock. The company provides many services related to the mobile stock service such as Stock Internet-Trading, Daytrade Lite (E-Payment), Mobile Services, SETTRADE IPO, and so on.

Settrade.com cooperates with four network operators such as AIS, DTAC, Orange, and HUTCH in order to provide the convenience for stock investor in viewing the stock information and trading stock via mobile phone.

There are about 15 brokers companies that co-operate in this service with Settrade.com Company Limited as follows:

(1) KRUNGSRI AYUTTHAYA Company Limited (AYS)

(2) KIATNAKIN Securities Company Limited (KKS)

(3) GLOBEX Securities Company Limited (Globlex)

(4) KGI Securities (Thailand) Company Limited (KGI)

(5) SICCO Securities Public Company Limited (SICCO)

(6) DBSVICKERS Securities (Thailand) Company Limited (dbsvickers)

(7) TRINITY Securities Company Limited (TRINITY)

(8) TISCO Securities Company Limited (TISCO)

(9) THANACHAT Securities Company Limited (NFS)

(10) BT Securities Company Limited (BT)

(11) BFIT Securities Company Limited (BFIT)

(12) PATTANASIN Securities Company Limited

(13) UNITED Securities Public Company Limited (UN)

(14) UOBkayhiam Securities Public Company Limited (UOBkayhian)

(15) INTEL VISION Securities Company Limited (IVS)

2.1.4 Common Features of Mobile Stock Service

(a) SMS Service

This service will charge the customer about 3 Baht/ 1 time when the customer requests the information. Almost every mobile phone in the market can use this service.

The highlights of this service are the followings:

(1) Receive data on the rise and fall of stock prices instantly.

(2) Support most existing mobile phones with SMS capability. The service is provided to customer without registration needed.

(3) Automatic REAL-TIME notification when selected stocks hit pre-set conditions such as ceiling price, floor price, etc.

There are common menu that the customers can request to view are as follows:

(1) SET

(2) SET 50 Index

(3) Market Active

(4) Top Gainer

(5) Top Loser

(6) Stock Quote

(7) Sector Quote

(b) WAP/GPRS Service

This service is developed with WAP technology (Wireless Application Program Version 1.2) and delivered to users via GPRS (General Packet Radio System) provided by many network operators. More than 60% of the mobile market can use this service because it supports WAP browser and GPRS capability on network operators.

This service will difference charge the customer depending on what they use either WAP or GPRS. If the customer uses WAP to view the stock information, they will be charged about 3 Baht/1 minute. If the customer uses GPRS to view the stock information, they will be charged 5 bath /a time logging into the service and the amount

of usage time that is 1 Baht/1 minute. For the stock trading, the customer will be charged by the commission rate at about 0.21%.

The highlights of this service are the followings:

(1) Receive data on the rise and fall of stock prices and market activities in Real-time.

(2) Access the service through mobileLIFE instantly with or without any registration (Settrade.com requires registration, MFS doesn't require registration).

(3) Enable stock information up to five stocks at a time.

(4) Graphical display of stock prices, and SET index.

There is common menu the customer can request to view via mobile phone that supports WAP/GPRS

(a) Stock Watch – A portfolio of up to 10 stocks can be monitored in REAL-TIME and reports can be delivered in both text and graphic format to the mobile phone.

(b) Stock Information – Stock information to assist the investment decision, display best bid and best offer in REAL-TIME for decision.

(c) Market Actives – The application is designed with REAL-TIME facility for customers to keep track of Stock Exchange and displaying both Text and Graphic information, such as SET Index, Foreigner Index, Top Gainer, Top Loser, Top Sectors, Ticker, and Most Swing.

(d) Stock News – REAL-TIME breaking NEWS on the market and stocks

(e) Virtual Portfolio Manager – Simulate and test the investment strategies.

(f) Stock Alert – The customers will be able to set their phone to act as their broker, alerting them when the interesting stock have changed and match

the customer's condition desired. Then the system will send the alerting signal. The quantities are volumes of trading, percentage of change, bid price, and etc.

(g) Broker News & Research – The customers will be able to speculate the brief news from SET, news on return of sharing, inside of company change, and including stock daily analysis, all of this are illustrated with graphic report.

(h) Stock Trading – The customers can manage the investment portfolio while one is sitting down in a Trading Room whenever both buying and selling or even checking the investment portfolio and trading confirmation.

(i) Stock Ticker – REAL-TIME display of all executed transactions of the stock market.

2.1.5 Success Factors

The factors successfully support this service are as follows: the convenience for customers because they can view or trade the stock anywhere and anytime. The service can match with the customers' attitude so that their companies can gain the loyalty customer because of customer's satisfaction.

2.2 Attitudes of Customers

2.2.1 Understanding Attitude (Philip Kotler, 2003:199).

There are many definitions for the term *attitude.* An attitude is a person's enduring favorable or unfavorable evaluations, emotional feelings, and action tendencies toward some objects or idea. People have attitudes toward almost everything; religion, politics, clothes, music, and food. Attitudes put them into a frame of mind of liking or disliking an object, moving toward or away from it. They lead people to behave in a fairly consistent way toward similar objects. People do not have to interpret and react to every object in a fresh way. Because attitudes economize energy

and thought, they are very difficult to change. A person's attitudes settle into a consistent pattern. To change a single attitude may require major adjustments in other attitudes.

2.2.2 Components of Attitude (William G. Zigmund, 2000:288)

There are 3 components disclosing in attitude: *affective, cognitive*, and *behavioral*

(a) The *affective component* reflects an individual's general feelings or emotions toward an object.

(b) The *cognitive component* represents one's awareness of and knowledge about an object.

(c) The *behavioral component* reflects buying intention and behavioral expectations; reflects a predisposition to action.

2.2.3 Attitude as a Hypothetical Construct (William G. Zigmund, 2000: 288)

Many variables business researchers wish to investigate are psychological variables which cannot be directly observed. To measure an attitude, it needs to infer from the way an individual responds (verbal expression or overt behavior) to some stimulus. The term hypothetical construct describes a variable that is not directly observable but it is measured by an indirect means, such as verbal expression or overt behavior.

2.2.4 Attitudes Influencing Purchase Decision

In the evaluation stage, the consumer forms preferences among the brands in the choice set. The consumer may also form an intention to buy the most preferred brand. However, there are 2 factors intervened between the purchase intention and the purchase decision. (See Figure 2.1)

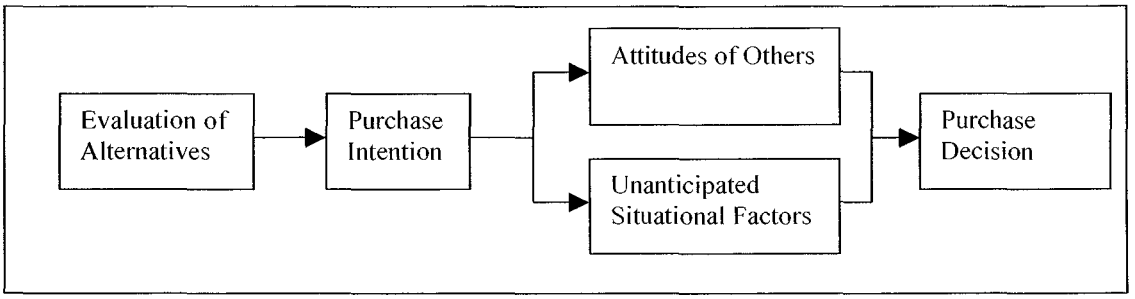

Figure 2.1. Steps between Evaluation of Alternatives and a Purchase Decision.

The first factor is the attitude of others. The extent to which another person's attitude reduces one's preferred alternative depends on two things: (1) the intensity of the other person's negative attitude toward the consumer's preferred alternative and (2) the consumer's motivation to comply with the other person's wishes. The more intense the other person's negativism and the closer the other person is to the consumer, the more the consumer will adjust his or her purchase intention. The converse is also true: A buyer's preference for a brand will be increased if someone he or she respects strongly favors the same brand. The influence of others becomes complex when several people close to the buyer hold contradictory opinions and the buyer would like to please all of them.

Related to the attitudes of others is the role played by *infomediaries* who publish their evaluations.

2.2.5 Attitudes Related to Buying (Philip Kotler, 2003:207)

Attitudes are an important topic for marketers because attitudes affect the selective processes, learning, and eventually the buying decisions people make.

Stimuli- ads, products, and stores are constantly bombarded us – yet we may not need or see anything. This is because we apply the following selective processes. (William D. Perreault, Jr., E. Jerome McCarthy 2003:158)

(a) Selective Exposure – our eyes and mind seek out and notice only information that interests us.

(b) Selective Perception or Selective Distortion – we screen out or modify ideas, messages, and information which conflict with previously learned attitudes and beliefs.

(c) Selective Retention – we remember only what we want to remember.

These selective processes help explain why some people are not affected by some advertising – even offensive advertising. They just don't see or remember it! Even if they do, they may dismiss it immediately. Some consumers are skeptical about any advertising message.

Our needs affect these selective processes, and current needs receive more attention. Marketers are interested in these selective processes because they affect how target market consumers get and retain information. This is also why marketers are interested in how consumers learn.

2.2.6 The Dimensions of Design Quality (Chase, Aquilano, Jacobs, 1998: 209)

As defined by the American National Standards Institute (ANSI) and the American Society for Quality Control (ASQC):

"Quality is the totality of features and characteristics of a product or service which bear on its ability to satisfy given needs."

The quality specification of a service derives from decisions and actions made relative to the quality of its design and the quality of its conformance to that design.

Design quality refers to the inherent value of the product in the marketplace and is thus a strategic decision for the firm. Dimensions of quality or quality characteristics, suggested by David Garvin, are what the customer looks in a product, listed in the Table 2.1 below.

Table 2.1. The Dimensions of Quality for Products & Service.

Dimension	*Meaning*	*Service Example: Checking Account at a Bank*
Performance	Primary service characteristics	Time to process customer requests
Features	Added secondary characteristics	Automatic bill paying
Reliability	Consistency of performance over time, probability of failing	Variability of time to process requests
Durability	Useful life	Keeping pace with industry trends
Serviceability	Ease of repair	On-line Reports
Response	Characteristics of the human-to-human interface (speed, courtesy, competence)	Courtesy of teller
Aesthetics	Sensory characteristics	Appearance of bank lobby
Reputation	Past performance and other intangibles (perceived quality)	Endorsed by community leaders

2.2.6 Key Success of Service Regarding Customer's Attitude

To increase the customer's satisfaction, and meeting expectations is important. Sometimes, attitudes and beliefs combine to form an *expectation* – an outcome or event that a person anticipates or looks forward to. Consumer expectations often focus on the benefits or value that the consumer expects from a firm's marketing mix. This is an important issue for marketers because a consumer is likely to be dissatisfied if his or her expectations are not met.

A key point here is that consumers may evaluate a product not just on how well it performs, but also on how it performs relative to their expectations. Thus, a company would be well advised to fit its product into existing attitudes rather than to try to change people's attitude. Of course, there are exceptions, where the cost of trying to change attitudes might pay off.

2.3 Research Process

2.3.1 Steps in the Research Process (Philip Kotler, 2003)

(1) Define the Problem and Research Objectives

Research objective is the researcher's decision of the problem under study. It defines the purposes of the research and the standards for what the research should accomplish.

(2) Develop the Research Plan

(a) Data Sources

The researcher can gather secondary data, and primary data or both. Secondary data are data those were collected for another purpose and already existed somewhere. Primary data are data freshly gathered for a specific purpose or for a specific research project.

(b) Research Approaches

Primary data can be collected in five ways: through observation, focus groups, surveys, behavioral data, and experiments.

(c) Research Instruments

Marketing researchers have a choice of three main research instruments in collecting primary data: questionnaires, psychological tools, and mechanical devices.

(d) Sampling Plan

After deciding on the research approach and instruments, the marketing researcher needs to design a sampling plan. There are seven stages in selecting samples as follows: (William G. Zigmund, 2000:342)

(1) Define Target Population

Target population is the specific, and complete group relevant to the research project.

(2) Select a Sampling Frame

Sampling Frame is the list of elements from which samples may be drawn; also called working population.

(3) Determine if a probability or non-probability sampling method will be chosen

The major alternative sampling plans may be grouped either probability techniques or non-probability techniques. In probability sampling, every element in the population has a known nonzero probability of selection. The simple random sampling is the best known probability sample, in which each member of the population has an equal probability of being

selected. In non-probability sampling, the probability of any particular member of the population chosen is unknown.

(4) Plan a procedure for selecting sampling units

Sampling unit is a single element or group of elements subject to selection in the sample.

(5) Determine Sample Size

The techniques of statistical inference are based on the relationship of the population distribution, the sample distribution, and the sampling distribution. This relationship is expressed in the central-limit theorem. The statistical determination of sample size requires knowledge of (1) the variance of the population, (2) the magnitude of acceptable error, and (3) the confidence level.

(6) Select Actual Sampling Units

During the actual sampling process, the elements of the population needs to be selected according to a certain procedure. If the target population has first been divided into units, the term primary sampling units (PSUs) designates units selected in the first stage of sampling. If successive stages of sampling are conducted, sampling units are called secondary sampling units, or tertiary sampling units.

(7) Conduct Fieldwork

A researcher who needs to make a decision concerning the most appropriate sample design for a specific project will identify a number of sampling criteria and evaluate the relative importance

of each criterion before selecting a sampling design. The most common criteria are accuracy requirements, resource availability, time constraints, knowledge availability, and analytical requirements.

(e) Contact Methods

Once the sampling plan has been determined, the marketing researchers need to decide how the subject should be contacted: mail, telephone, personal, or online interview.

(3) Collect the information

Collecting information through survey research is the moment response mood. It requires how to make the respondents understand and participate in filling out questionnaire or talking with the researcher in a personal interview

(4) Analyze the information

Data processing generally begins with editing before transferring data to the computer and then coding data by computer or hand tabulation. Data Analysis is the logic application to understand the gathered data by the statistical analysis.

(5) Present the findings

Report presentation need to be complete and thoroughly objectives. Authenticate objectives need to be kept constantly in mind through the entire report process.

(6) Make the decision

The result of findings will be used in this part to further define the implementation.

2.3.2 Survey Method (Philip Kotler, 2003: Page 133)

(1) Survey Research

Surveys are best suited for descriptive research. Companies conduct surveys to learn about people's knowledge, beliefs, preferences, and satisfaction, and to measure these magnitudes in the general population.

(2) Survey Instrument

Questionnaire is used for the survey method. A questionnaire consists of a set of questions presented to respondents. By its flexibility, the questionnaire is by far the most common instrument used to collect primary data. Questionnaires need to be carefully developed, tested, and debugged before they are administered on a large scale.

(3) Questionnaire Design

In preparing a questionnaire, the researchers need to carefully choose the questions and their forms, wording, and sequence. In developing a questionnaire, there are some guidelines those help to avoid the most common mistakes to be developed from research experience as follows:

(1) Avoid complexity: Use simple, and conversational language

(2) Avoid leading and loaded questions: Leading question is a question that suggests or implies certain answers. Loaded question is a question that suggests social-desirability answers or is emotionally charged.

(3) Avoid ambiguity: Be as specific as possible

(4) Avoid double-barreled items: Double-barreled items are a question that may induce bias it covers two issues at the same time.

The form of the questions can influence the response. There are two types of questions which can be designed the questionnaire which are the closed-end and the

open-ended questions. The closed-end questions specify all the possible answers and provide answers easy to interpret and tabulate. There are various types of fixed-alternative questions such as simple-dichotomy question, determinant-choice question, attitude rating scale, and so on. The open-ended questions allow respondents to answer in their own words and often reveal more about how people think. They are especially useful in exploratory research, where the researchers is looking for insight how people think rather than measuring how many people think in a certain way.

2.3.3 Techniques for measuring attitudes

(1) Type of Level measurement (See figure X) (Douglas A. Lind, William G. Marchal, Samuel A. Wathen: page 13)

There are 4 basics level of data that included nominal, ordinal, interval, and ratio.

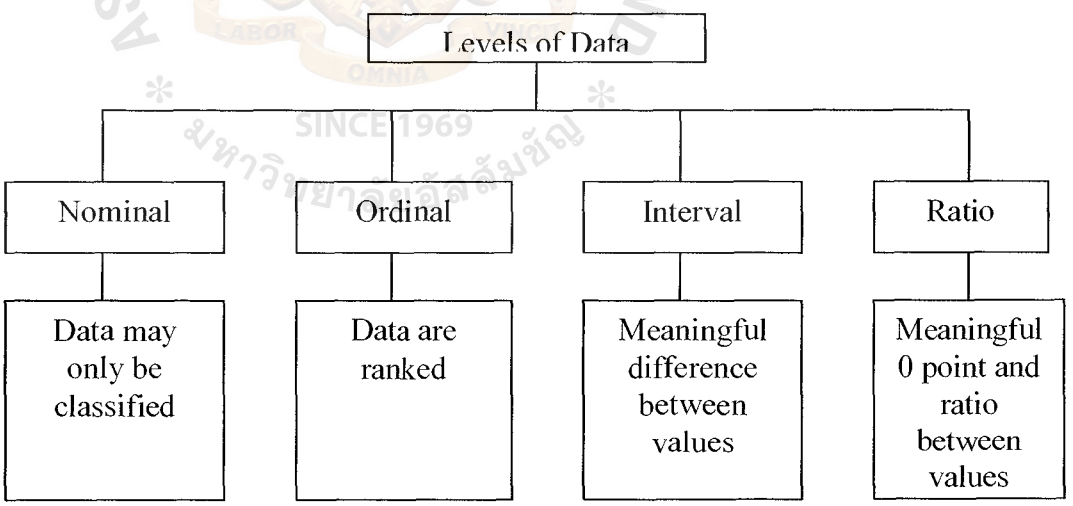

Figure 2.2. Summary of the Characteristics for Levels of Measurement.

(2) Self-Report Attitude Rating Scales (William G. Zigmund, 2000: 289)

Self-report is a method of assessing attitudes in which individuals are asked about their beliefs or feelings toward an object or class of objects. Several techniques are:

Ranking: It requires that the respondents' rank order are small number of activities, events, or objects in overall preference in the basis of some characteristic of the stimulus

Rating: It requires the respondents to indicate the position among ordered categories which correspond to their attitudes.

Sorting: A measurement technique that presents a respondents with several concepts and requires the respondents to arrange the cards into a number of piles or to otherwise classify the concepts

Choice: A measurement task that identifies preferences requiring respondents to choose between two or more alternatives.

Using rating scales to measure attitudes is perhaps the most common practice in business research. There are some examples of attitude rating scales as follows:

(a) Simple Attitude Scaling – In its most basic form, the attitude scaling requires an individual agree or disagree with a statement or responds to a single question. For example, respondents in a poll may be asked whether agree or disagree. Because this type of self-rating scale merely classifies respondents into one of two categories, it has only the properties of a nominal scale. Simple attitude scaling may be used when the questionnaire is extremely long, or respondents have low education, or for other specific reason.

(b) Category Scales – Some rating scales have only two response categories: agree or disagree. Expanding the response categories provides the respondent more flexibility in the rating task. Even more information is provided the categories are ordered according to a descriptive or evaluative dimension. For example, "Never", "Rarely", "Sometimes", "Often", "Very Often".

(c) Summated Ratings Method: The Likert Scale – Business Researcher's adaptation of the summated ratings method, developed by Rensis Likert, is extremely popular for measuring attitudes because the method is simple to administer. With the Likert Scale, respondents indicate their attitudes by checking how strongly they agree or disagree with carefully constructed statements that range from very positive to very negative toward the attitudinal object. Individuals generally choose from five alternatives: strongly agree, agree, uncertain, disagree, and strongly disagree.

2.3.4 Data Analysis Theory

The most common descriptive statistic associate with each type of scale. It is important to remember that all descriptive statistics appropriate for a lower-order scale are also appropriate for high-order scales.

(a) Tabulating data

Tabulation refers to the orderly arrangement of data in a table or other summary format. Counting the number of responses to a question and putting them in a frequency distribution is a simple, or marginal, tabulation. Simple tabulation of the responses or observations on a question-by-question or item-by-item basis provides the most basic form of information for the researcher and in many cases the most useful information. It tells the

researcher how frequently each response occurs. The starting point for analysis requires the counting of responses or observation for each of the categories or codes assigned to a variable. The frequency table is a simple tabulation that indicates the frequency with which respondents give a particular answer. Whether the data are tabulated by computer or by hand, it is useful to have percentages and cumulative percentages as well as frequency distribution.

(b) Cross Tabulation

Cross Tabulation is a technique organizing data by groups, categories, or classes, thus facilitating comparisons; a joint frequency distribution of observations on two or more sets of variable. The purpose of categorization and cross-tabulation is to allow the inspection of differences among groups and to make comparisons. This form of analysis also allows for determination of the form of relationship between two variables. Cross-tabulating the results of business research helps clarify the research findings as they pertain to industry, market, and organizational segment.

(c) Factor Analysis

It is a method to reduce the number of dimensions by combining the same dimensions into one single factor. A correlation would reveal that the two measures are highly correlated.

(d) Hypothesis Testing.

It is purposively to make a judgment about the difference between two samples statistics or the sample statistic and a hypothesized population parameter.

III. RESEARCH METHODOLOGY

3.1 Research Methodology

The project is a descriptive research determined by qualitative data to serve the main purpose of evaluating the consumer's attitude towards Mobile Stock Service.

It surveys the primary research by collecting data from questionnaire and the secondary source obtained from the literature search. However, to meet the objectives of the project, the primary data is viewed more important. So, it requires the appropriate survey methods in developing and implementing data collection procedure, designing the sample, and analyzing the results.

Research design must be consistent to research objectives. Descriptive research is developed for describing the characteristics of the current situations, determining the relationships among marketing variables, and predicting the prospective opportunities.

It conducted the structured and undisguised questionnaire for standardizing responses covered. The study has developed non-probability sampling as convenience sampling to randomly ask respondents to answer the questionnaires. Data processing is through SPSS program for the most accuracy in both interpretation and evaluation of the organized data.

The author decides to interpret data by both descriptive statistics, the first step in data analysis to summarise the data, and inferential statistics, dealing with inferences about populations based on the behaviour of samples. Each method will be used suitably to answer the statements of problems.

3.2 Research Sample

Due to the time constraint and the enormous costs of conducting research over the total population, the research sample designed to pursue the objectives of study instead.

For the most accurate results, the author infers a sample to the total population. Thus, the following four common steps to draw a sample are called for.

(a) Define the Population.

(b) Sampling Frame.

(c) Sample Size.

(d) Sampling Procedure.

Define the Population

After considering many rationales, I decide to nominate a finite population. The inclusive population is defined as Stock Investors in Thailand who are using Mobile Stock Service which number is about 50,000 people.

Sampling Frame

The author acquires sampling frame, a list of elements from which the sample will be drawn. The sampling frame will be the stock investors in Thailand who are using Mobile Stock Service both male and female who are15 years and above, as well as living in Bangkok. The reason is people of 15 years and above is the age range of target market that the service providers mentioned. I frame the area within Bangkok since this area has the highest value of stock trading which can define as 85.44% from the total value

Sample Size

By using the table below (Adapted from Krejcie & Morgan, 1970:608), Required Sample Size, Given a Finite Population, Where N= Population Size and n= Sample Size; no calculation is required. Due to the population will be total number of stock investors in Thailand who are using Mobile Stock Service that has about 50,000 people, the sample size in this research will be 381. (See result from the table 3.1)

Table 3.1. Required Sample Size in Given Population.

N – n	N – n	N – n	N – n	N – n
10 – 10	100 – 80	280 – 162	800 – 260	2800 – 338
15 – 14	110 – 86	290 – 165	850 – 265	3000 – 341
20 – 19	120 – 92	300 – 169	900 – 269	3500 – 346
25 – 24	130 – 97	320 – 175	950 – 274	4000 – 351
30 – 28	140 – 103	340 – 181	1000 – 278	4500 – 354
35 – 32	150 – 108	360 – 186	1100 – 285	5000 – 357
40 – 36	160 – 113	380 – 191	1200 – 291	6000 – 361
45 – 40	170 – 118	400 – 196	1300 – 297	7000 – 364
50 – 44	180 – 123	420 – 201	1400 – 302	8000 – 367
55 – 48	190 – 127	440 – 205	1500 – 306	9000 – 368
60 – 52	200 – 132	460 – 210	1600 – 310	10000 – 370
65 – 56	210 – 156	480 – 241	1700 – 313	15000 – 375
70 – 59	220 – 140	500 – 217	1800 – 317	20000 – 377
75 – 63	230 – 144	550 – 226	1900 – 320	30000 – 379
80 – 66	240 – 148	600 – 234	2000 – 322	40000 – 380
85 – 70	250 – 152	650 – 242	2200 – 327	50000 – 381
90 – 73	260 – 155	700 – 248	2400 – 331	75000 – 382
95 – 76	270 – 159	750 – 254	2600 – 335	1000000 – 384

Sampling Procedure

Sampling procedure is related to the sampling frame because the researcher can employ the probability sampling method once the target population can be specified. Each respondent, or sample, will be drawn randomly with no limitation since every element in the frame has non-zero probability of selection.

In this part of design sample, it can be concluded that the survey will be administered to 381 respondents.

3.3 Data Collection

Questionnaire Development

The survey instrument has developed the structured-undisguised questions for asking about the respondents' perception.

Totally 24 questions are divided into 2 sections.

(a) Section 1: Personal Information.

(b) Section 2: Customer's Attitude towards Mobile Stock Services.

Section 1: Personal Information

There are 11 questions developed in dichotomous and multiple choices as the question type. Among these questions, questions no. 1 to no. 5 ask about respondents' profile and question no. 6 to no. 8 ask about the respondents' dealing with the customer behavior pattern in viewing stock information and trading stock.

Section 2: Customer's Attitude towards Mobile Stock Services.

This part develops the summated rating scale or the Likert Scaling to rate the respondents' attitudes towards Mobile Stock Service. There are altogether 14 questions. Each question is related to 14 variables. These variables are categorized by the dimensions of design quality for service to measure the results of customer's attitude as the followings:

(a) Accuracy – To trust whether Mobile Stock Service provides the accurate stock information

(b) Promptness – To trust whether Mobile Stock Service provides the stock information from PRS at Stock Exchange of Thailand in REAL-TIME.

(c) Features – To think that the menu in the application is sufficient to support the decision-making of stock investors.

(d) Reliability – To ensure that the applications can support the large number of users that access simultaneously

(e) Durability – To think that it will still compatible to their lifestyle in the future

(f) Serviceability – To trust that the customers can access any time of the day during stock market opens.

(g) Responsiveness – To trust that they will receive the prompt response when the customer requests to view the stock information

(h) Aesthetics – To ensure that the menu of the application is quite user-friendly

(i) Credibility – To enhance the confidence of customer in trading stock with Broker that service providers connect to

(j) Security – To feel safe to trade stock via mobile phone other than any ways with high security technology

(k) Convenience – To agree that mobile stock service can help the stock investors more convenience in viewing the stock information and trading stock

(l) Price – To agree that the price that the service providers and network

(m) operator are charging now from the customer is reasonable price

(n) Service Charge – To consider that the commission charged by broker is reasonable

(o) Promotion – To consider that the promotion is one factor that can attract the customer to use the service more so that the network operators and service providers can increase sale force

Data Collection Procedure

It gathers the primary research through the self-administered questionnaires by members of the research group. The author gathers only the set of questionnaires that respond to the sampling procedure. I am responsible for spreading the questionnaires to the target respondents. It requires the respondents' receptiveness.

The questionnaires are distributed to the 381 target respondents who are stock investors in Thailand who uses the Mobile Stock Service, both male and female aged 15 years and above, as well as living in the Bangkok by convenience sampling method.

3.4 Data Analysis

The survey has developed the self-reports, which respondents are directly asked to report their attitudes by responding to the questionnaire. Also, it has developed rating scales to indicate the degree of attitude among each questioning statement. I analyze data by the following methods:

(a) Frequencies and Percentages

(b) Mean Evaluation

(c) Factor Analysis

(d) Hypothesis Testing

Frequencies and Percentages

They are useful for interpretation of personal data in Section 1

(1) Question no.1 to no. 5 are presented by comparing among their percentages with the bar chart

(2) Question no. 6 to no. 8 are presented by comparing among their percentages with the pie chart

I select some variables from total questions to use crosstabulation to find the relationship among them. The results of Crosstabulation are presented by bar chart.

The 14 questions in Section 2 are presented with their means or percentages by bar chart and pie chart.

Mean Evaluation

It is used to measure the degree of attitudes towards Mobile Stock Service based on common dimension of design quality for service. All questions in section 2 are named as variables. I evaluate them by the value of coding phased items:

5 = Strongly Agree

4 = Agree

3 = Neutral

2 = Disagree

1 = Strongly Disagree

Then, I set another rating schemes to evaluate the level of agreement by dividing range with number of rating level as shown in Table. After finding the attitudes of each variable, I weight the total mean by the sum of variables dividing with 14 for general attitude, and with 8 for perception based on common dimension of quality for service.

Factor Analysis

I analyze factors to the new extracted three factors: product, price, and promotion. I grouped 11 first items into products and the remaining items are grouped into price and promotion. Factor Analysis is used to summarize the information contained in a

large number of variables into a smaller number of factors. This helps the researcher to easily get the data conclusion.

By these methods, after running all variables, I get the other 3 extracted factors that are grouped by one or more selected variables. The most important factor is measured by comparing means of each factor. Then, I finalize the important factor mean to respondents by comparing means of each category with each factor.

Hypothesis Testing

Independent Sample T-Test is used to compare the means of one variable against another variable. I study three cases by testing hypotheses set to be alternative hypothesis. Each case has one hypothesis, and I set the null hypothesis to oppose each meaning. Due to the normal distribution, the result of testing hypotheses requires the hypothesis acceptance. I value 95% level of confidence which means that if value of sig. (2-tailed) > 0.05 then reject the alternative hypothesis.

IV. DATA ANALYSIS

The project has surveyed the customer's attitude towards Mobile Stock Service. According to the research methodology, the questionnaires have been issued to 381 respondents, the stock investors in Thailand who are using Mobile Stock Service. The 15 days of distribution period was May 16 – May 30, 2004. After getting all targeted responses, it comes to the process of finding the results.

The survey results are divided into 5 parts: personal profile, consumer's attitude towards mobile stock service, customer's attitude based on dimensions of service quality, and factors influencing services implementation, deduction from Independent sample T-Test.

4.1 Personal Profile

Questions no. 1 to 5 from section 1 are pertaining to gender, age, education level, occupation, and monthly income. Table of frequencies and percentages are listed in Table A.1 (Appendix A). The details of personal profile are shown in Figure 4.1 to 4.5.

4.1.1 Personal Data of Respondent

Gender. There are 51.2% of females and 48.8% of males from the total 381 respondents.

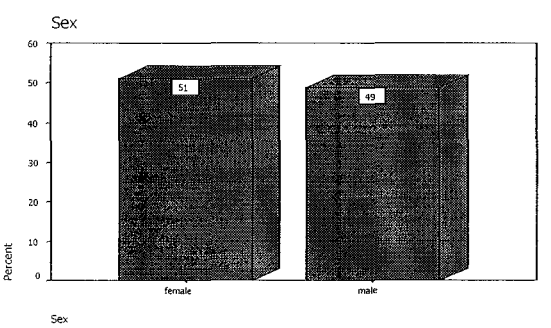

Figure 4.1. Gender of Respondents.

Age. Respondents are grouped into four groups as shown in Figure 4.2. Most of them, 22% are 15-24 years, 51% are 25 to 34 years old, and 27% are at 35 years above.

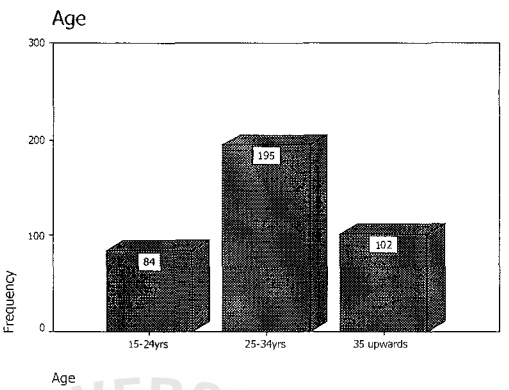

Figure 4.2. Age of Respondents.

Education Level. The survey has grouped four education levels. Among 381 samples, only 1% has less than Bachelor Degree, 43.3% have bachelor degrees, 49.1% have master degrees, and 6.6% with doctoral degree.

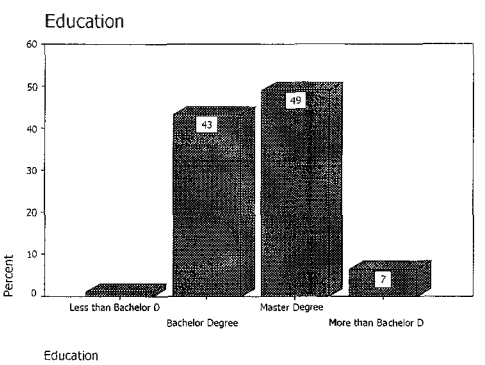

Figure 4.3. Education Level of Respondents.

Occupation. It is divided into 5 groups: 23.4% are employees of state enterprises, 54.3% are employees of private companies, 15.5% own business, and 6.8% are from others.

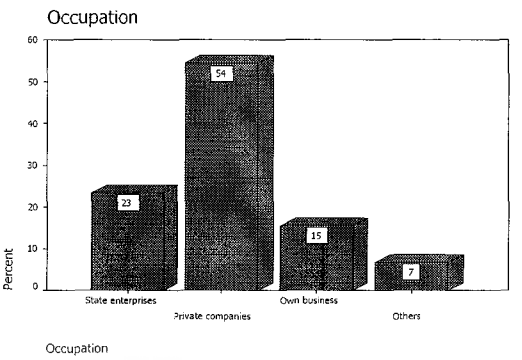

Figure 4.4. Occupation of Respondents.

Monthly Income. Valued respondents are grouped into four ranges of monthly income (in Baht): 53.5% earn less than 50,000, 19.2% earn 50,000-80,000, 11.0% earn 80,000-100,000, and 16.3% earn more than 100,000.

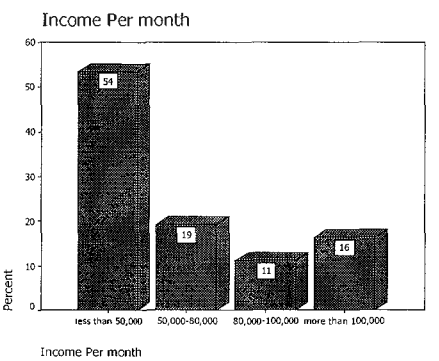

Figure 4.5. Monthly Income of Respondents.

From the personal details shown in Figures 4.1 to 4.5, I conclude that among the total 381 respondents, the majority are females (51.2%). A large group of people is 25 to 35 years (51.2%). Most of them are graduated with Master Degree (49.1%). They mostly earn less than 50,000 bahts per month (53.5%) and currently working as employees of private companies (54.3%).

4.1.2 Respondents Data Dealing with Mobile Stock Service

Results from questions no. 6 to no. 8 are data of respondents relating to Mobile Stock Services as shown in Figure 4.6 to 4.8. The detail of frequencies and percentages from question no. 6 to no. 8 will be shown in Table A.2 (Appendix A).

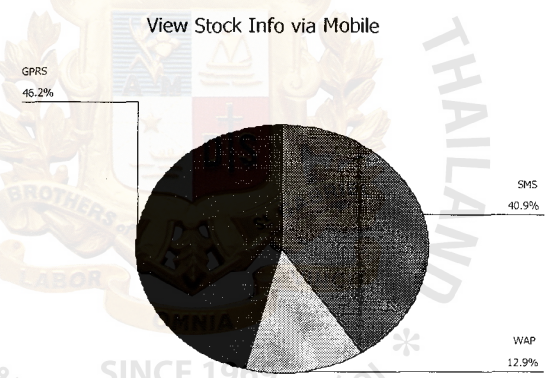

Figure 4.6. Respondents who view the stock information via mobile phone.

Figure 4.6, most respondents view stock information via GPRS (46.2%). 40.9% view stock information via SMS, and only 12.9% view stock information via WAP.

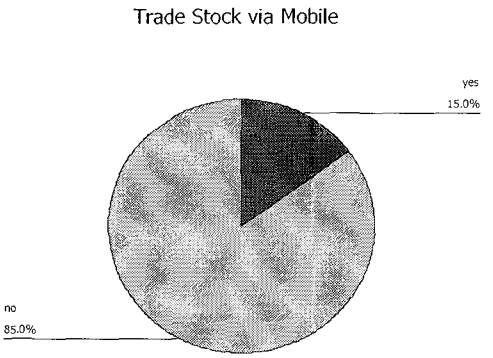

Figure 4.7. Respondents who trade stock via mobile phone.

Figure 4.7, there are about 15% of respondents who trade stock via mobile phone and 85% are the respondents who do not trade the stock via mobile phone.

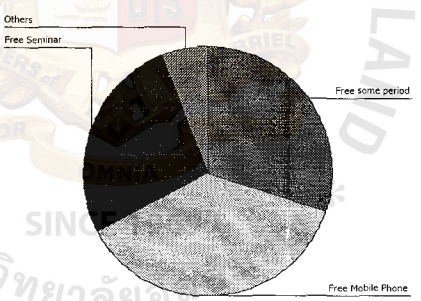

Figure 4.8. Promotion that respondents prefer.

Figure 4.8, most respondents prefer the promotion which is free mobile phone (37.3%). 29.9% prefer to use free in some period if they use more. 27.0% prefer to get the privilege in attending free seminar on mobile stock service during lifetime.

From Figure 4.6 to 4.8, I conclude that most of them which is 46.3% prefer to view the stock via GPRS. About 15% of all respondents trade stock via mobile phone. The promotion that most respondents prefer is to get free mobile phone covering about 37.3% from total respondents.

Crosstabulation of Relationship among Question no. 1 to no. 8

The Crosstabulation will represent the relationship between two variables. I employed the Crosstabulation to get more detailed of conclusion in the question 4.6 and 4.8. Figure 4.9, 4.10, and 4.11 will show the result from Crosstabulation. The detailed results will be shown in Table A.3 (Appendix A).

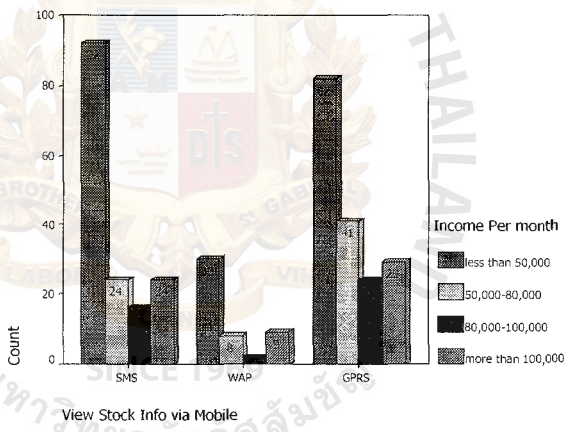

Figure 4.9. The customer's behavior pattern in viewing the stock information VS Income per month.

Figure 4.9 shows that the respondents who earn less than 50,000 Baht per month prefer to view the stock information both via SMS and GPRS.

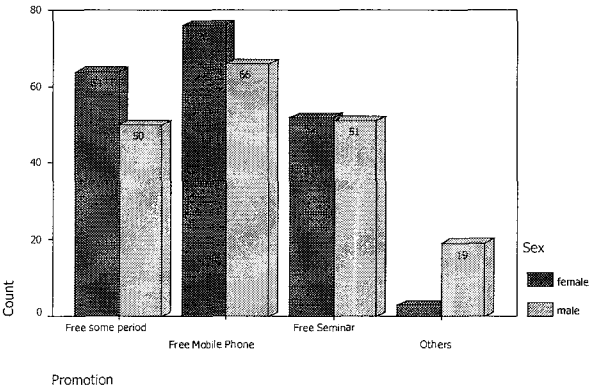

Figure 4.10. Sex VS Promotion.

Figure 4.10 shows both male and female prefer the promotion that is free mobile phone.

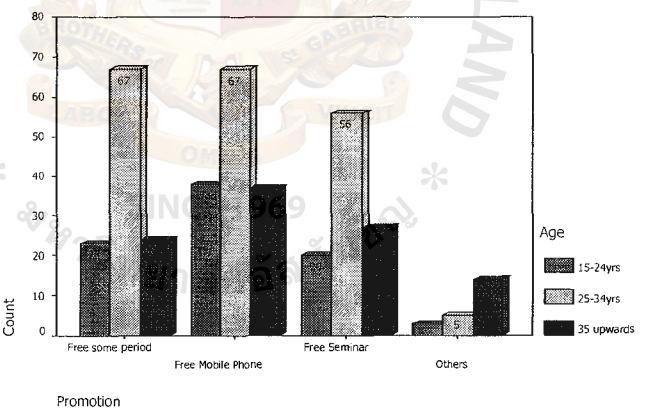

Figure 4.11. Age VS Promotion.

Figure 4.11 shows that the target respondents of service providers with ages ranged between 15-34 years prefer two promotions equally with free use in some period if they use more and get free mobile phone.

4.2 Customer's Attitude towards Mobile Stock Services

Section 2 has modified the Likert Scaling to indicate the degree of respondent's attitude towards Mobile Stock Services. There are 14 checklists and each has one variable. All results are coded for numerical analysis conducted by these coding phased items: Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly Disagree = 1.

To get the general idea of consumer's perception, I consider assessing the level of measurement by means of variables. SPSS data processing calculate descriptive statistics (such as mean, standard deviation and variances) for all surveyed item.

Then, I compute the levels of measurement by:

Maximum Coding Score – Minimum Coding Score/ Number of Rating Levels.

Thus, I use 0.8 (5-1/5 = 0.8) to rate the levels of agreement as the following scoring scheme:

The Average Scoring	Level of Measurement
1.00-1.80	Strongly Disagree
1.81-2.60	Disagree
2.61-3.40	Neutral
3.41-4.20	Agree
4.21-5.0	Strongly Disagree

Table 4.1 presents mean evaluation of 14 items from all responses which are already measured by the ranges of average scoring. (Table A.4 in Appendix A)

Table 4.1. Mean Evaluation for General Perceptions.

Variable Items	Mean	Standard Deviation	Level of Measurement
1. Accuracy	3.82	.779	Agree

Table 4.1. Mean Evaluation for General Perceptions (Continued).

Variable Items	Mean	Standard Deviation	Level of Measurement
2. Promptness	3.60	.882	Agree
3. Features	3.30	.871	Neutral
4. Reliability	3.14	.930	Neutral
5. Durability	4.01	.973	Agree
6. Serviceability	3.05	.800	Neutral
7. Responsiveness	3.03	.891	Neutral
8. Aesthetics	3.20	.822	Neutral
9. Credibility	3.41	.733	Agree
10. Security	3.37	.886	Neutral
11. Convenience	3.96	.905	Agree
12. Price	2.59	1.112	Disagree
13. Service Charge	2.61	.993	Neutral
14. Promotion	4.15	.678	Agree
Total Means =	47.24/14=3.374	Equals to	Neutral

From the survey results, I conclude that total means of customer's attitude in general falls into the neutral level (mean=3.374). Responses are mostly ranged in the neutral level (7 variables). Other levels of measurement are 6 variables for agree and 1 variable for disagree. The details of mean evaluation can be described as follows:

(a) Agree Level

(b) Neutral Level

(c) Disagree Level

Agree Level

The level concerns the consumer's viewing of mobile stock service in main function by 5 variables as shown in Figure 4.12.

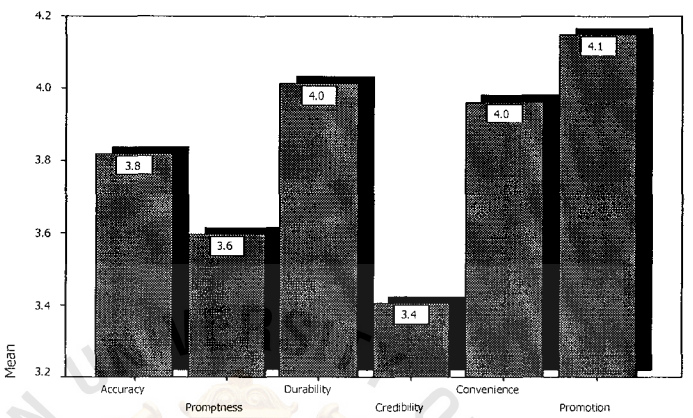

Figure 4.12. Mean Values of Factors in Agree Level.

The customers trust that they receive the accurate stock information from Price Reporting System or PRS at stock exchange of Thailand in REAL-TIME. (Accuracy, mean =3.82 and Promptness, mean=3.6). They also believe that they still can use their mobile phone to view the stock information and use for stock trading in the future (Durability, mean=4.01). The outcomes indicate that the reputation of the Broker whom the service providers connect can enhance their confidence of customers in trading stock (Credibility, mean=3.41). They thinks that this service can provide more convenience for the stock investors because it allows them to view the stock information and trade the stock via mobile phone rather than station in a trading room, in front of a TV set or tied to a computer screen to stay in touch with the market and conduct trades

(Convenience, mean = 3.96). The customers think that the way that can stimulate them to use the service more is to launch the promotion (Promotion, mean= 4.09)

Neutral Level

The level concerns the consumer's viewing of mobile stock service in main function by 7 variables as shown in Figure 4.13.

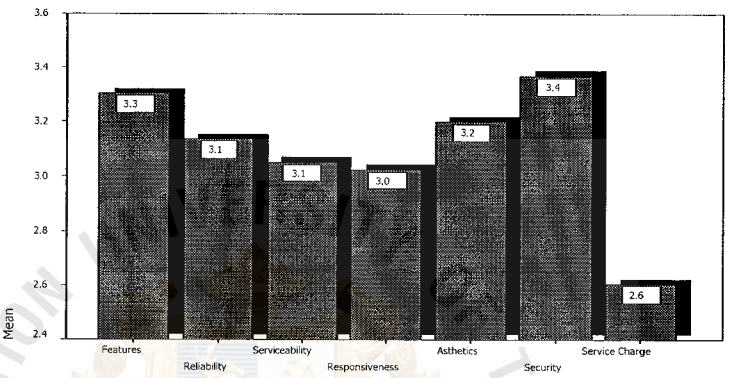

Figure 4.13. Mean Values of Factors in Neutral Level.

The customers think that the menu in the application is not quite user-friendly and insufficient to support the decision making in using the service at all (Aesthetics, mean = 3.20, Features, mean = 3.30). They do not ensure that they will be able to access the service when there is numerous numbers of people are trying to access simultaneously (Reliability, mean = 3.14, serviceability, mean = 3.05). They do not think that they can get the prompt response everytime they request to view the stock information (Responsiveness, mean = 3.03). They do still hesitate to trade the stock via their mobile phone because they still do not confidence in the security technology applied (Security, mean = 3.37). Also, they are not ensured that the commission that broker companies

charge them when they trade stock via mobile phone is reasonable. (Service Charge, mean = 2.61)

Disagree Level

Price is the only item in this level. The customers seem to be price-sensitive because they think that the price that service providers and network operators are charging now is not reasonable for them (Price, mean = 2.59)

4.3 Customer's Attitude based on Dimensions of Service Quality

Customer's attitude of the design service quality (measured by common dimensions of design service quality) is determined by combining variables into eight groups. Some items may be overlapping. Dimensions of deign service quality and their corresponding items are as follows:

(1) Performance (Item 1,2,7)

(2) Features (Item 3,11,12)

(3) Reliability (Item 4,6)

(4) Durability (Item 5)

(5) Serviceability (Item 6,2)

(6) Response (Item 7,2)

(7) Aesthetics (Item 8,3)

(8) Reputation (Item 9,10,13)

The results of customer's attitude towards the quality of Mobile Stock Service are shown in Figures 4.14. They indicate the comparison of means among eight factors. I conclude that respondents mostly determine the reputation (mean = 3.9711) and least on serviceability (mean = 3.0735).

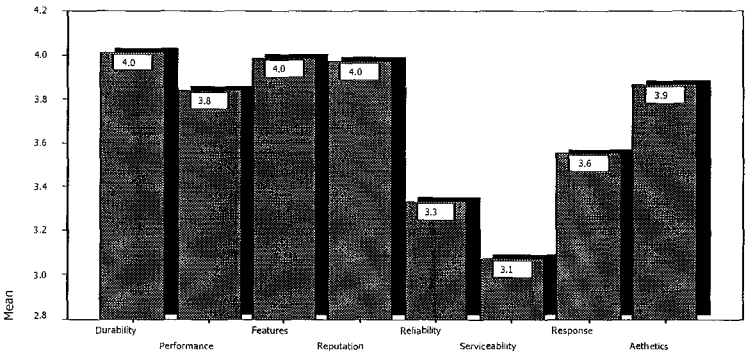

Figure 4.14. Means of Consumer's Perception Based on Quality Dimensions.

The average mean value of consumer's attitude based on quality dimensions is calculated by the sum of each factors divided by eight. So, the result equals to 3.70 (3.8399+3.9843+3.3307+4.0131+3.0735+3.5538+3.8661+3.9711/8=3.70) that means consumer's perception based on service quality of the convenient banking services falls in the agree level.

There are two factors among eight dimensions of Quality Services which are Reputation and Serviceability and grouped by more than one factor. So, I compare means among each factor in Reputation and Serviceability to find the most important factor as shown in Figures 4.15 and 4.16.

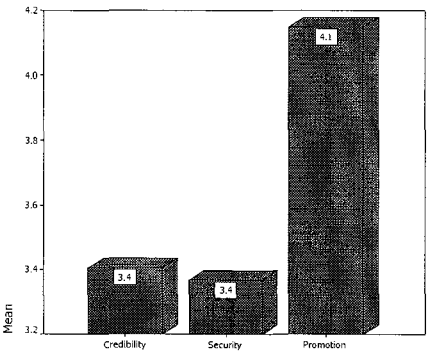

Figure 4.15. Means Comparisons of Reputation Factor.

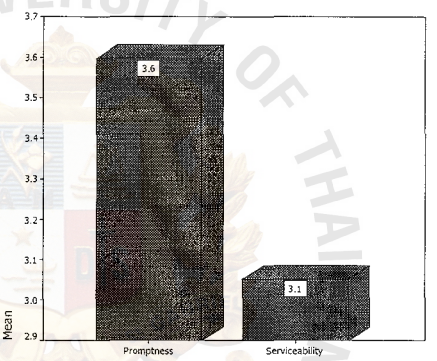

Figure 4.16. Means Comparisons of Serviceability Factor.

Figure 4.15 and 4.16, Promotion (mean = 4.15) is viewed as the most important factor for Reputation and Promptness (mean = 3.60) seems to be the most concerning factor for Serviceability.

4.4 Factors Influencing Services Implementation

From 14 variables in the survey, I analyze all of them into three factors which are product, price, and promotion by grouping them into each group. The results of factor analysis are presented as the factor pattern matrix (or component matrix) in Table 4.2

In table 4.2, the selected variables are represented by three extracted components. Each factor is gathered by the gray shading in each column. Four extracted factors are product, price, and promotion.

Table 4.2. Factor Analysis of Selected 14 Items.

Variables	Components		
	1	2	3
Accuracy	0.640	-0.143	0.555
Promptness	0.689	-0.202	0.528
Features	0.602	-0.114	0.386
Reliability	0.628	-0.029	-0.174
Durability	0.551	0.031	-0.287
Serviceability	0.590	-0.246	-0.802
Responsiveness	0.635	-0.211	-0.260
Aesthetics	0.638	-0.201	-0.253
Credibility	0.538	-0.851	0.258
Security	0.590	-0.642	-0.411
Convenience	0.652	0.245	-0.264
Price	0.204	0.794	-0.334
Service Charge	0.369	0.705	0.239
Promotion	-0.061	-0.256	0.154

Results of Factor Analysis

(a) Product. Eleven variables are grouped together: Accuracy, Promptness, Features, Reliability, Durability, Serviceability, Responsiveness, Aesthetics, Credibility, Security, and Convenience.

(b) Price. This factor concerns how customers think about the price that service provider and network operators charged whether is it reasonable or not.

(c) Promotion. This factor concerns about the promotion which can attract them to use the service more or not.

Table 4.3 represents means of these 3 factors. The total mean value is 3.60 that fall into the Agree level of agreement.

Table 4.3. Means of Relating Factors.

Factors	Mean	Standard Deviation	Level of Measurement
Product	3.8819	.61491	Agree
Price	2.7769	.90617	Neutral
Promotion	4.1496	.67760	Agree
Total Mean =	3.60	Equals to	Agree

4.5 Deduction from Independent Sample T-Test

The Independent Sample T-Test procedure compares means for two groups of cases. I opt to employ it since the comparison here is to compare the mean of one variable against another variable, not the case that is against the contrast.

I use T-test to prove the following cases:

(1) There is a significant difference in customer's attitude of quality dimensions between people of 15-24 years and people of 25 years above.

(2) There is a significant difference in attitude of quality dimensions between people who view the stock information via SMS and those who view the stock information via WAP or GPRS.

(3) There is a significant difference in attitude of quality dimensions between those who trade stock via mobile phone and those who do not.

The solutions of these three cases are presented by testing hypotheses as resulted in Table 4.4 to Table 4.6.

Table 4.4. T-Test of Customer's attitude of quality dimensions between people aged 15-34 and people aged 35 and upward.

Variable	Age Range	Mean	Standard Deviation	t	Sig. (2-tailed)
Performance	15-34	3.9032	0.67958	2.942	0.003
	35 and upwards	3.6667	0.73570	2.835	0.005
Features	15-34	4.0323	0.68043	2.105	0.036
	35 and upwards	3.8529	0.87197	1.878	0.062
Reliability	15-34	3.3871	0.71014	2.475	0.014
	35 and upwards	3.1765	0.80113	2.340	0.020
Durability	15-34	4.1398	0.88054	4.303	0.000
	35 and upwards	3.6667	1.11988	3.853	0.000
Serviceability	15-34	3.1219	0.71935	2.142	0.033
	35 and upwards	2.9412	0.75549	2.093	0.038
Responsiveness	15-34	3.6165	0.72460	2.693	0.007
	35 and upwards	3.3824	0.82106	2.541	0.012
Aesthetics	15-34	3.9749	0.74144	4.610	0.000
	35 and upwards	3.5686	0.81459	4.413	0.000

Table 4.4. T-Test of Customer's attitude of quality dimensions between people aged 15-34 and people aged 35 and upward (Continued).

Variable	Age Range	Mean	Standard Deviation	t	Sig. (2-tailed)
Reputation	15-34	3.9857	0.55601	0.877	0.381
	35 and upwards	3.9314	0.47219	0.946	0.345

H0 There is no significant difference between the group of 15-34 year and 35 years and above

H1 There is significant difference between the group of 15-34 year and 35 years and above

If value of sig. (2-tailed) > 0.05 means accept H0

Results:

(a) There is significant difference between the group of 15-34 years and 35 years and above in attitude of durability, performance, reliability, serviceability, responsiveness, and aesthetics.

(b) There is no significant difference between the group of 15-34 years and 35 years and above in attitude of features and reputation.

Table 4.5 T-Test of Customer's attitude of quality dimensions between people who view the stock information via SMS and those who view the stock information via WAP or GPRS.

Variable	Group Range	Mean	Standard Deviation	T	Sig. (2-tailed)
Performance	SMS	3.6667	0.67521	-4.093	0.000

Table 4.5 T-Test of Customer's attitude of quality dimensions between people who view the stock information via SMS and those who view the stock information via WAP or GPRS (Continued).

Variable	Group Range	Mean	Standard Deviation	T	Sig. (2-tailed)
	WAP/GPRS	3.9600	0.69642	-4.116	0.000
Features	SMS	3.8846	0.70903	-2.200	0.028
	WAP/GPRS	4.0533	0.75404	-2.225	0.027
Reliability	SMS	3.1667	0.70787	-3.659	0.000
	WAP/GPRS	3.4444	0.74269	-3.691	0.000
Durability	SMS	3.9423	0.82884	-1.185	0.237
	WAP/GPRS	4.0622	1.05883	-1.238	0.217
Serviceability	SMS	3.0321	0.76555	-0.919	0.359
	WAP/GPRS	3.1022	0.70915	-0.907	0.365
Responsiveness	SMS	3.4038	0.69819	-3.257	0.001
	WAP/GPRS	3.6578	0.78105	-3.324	0.001
Aesthetics	SMS	3.8141	0.70760	-1.082	0.280
	WAP/GPRS	3.9022	0.82875	-1.114	0.266
Reputation	SMS	3.8974	0.52277	-2.252	0.025
	WAP/GPRS	4.0222	0.53822	-2.263	0.024

H0 There is no significant difference between people who view the stock information via SMS and those who view the stock information via WAP or GPRS.

H1 There is significant difference between people who view the stock information via SMS and those who view the stock information via WAP or GPRS.

If value of sig.(2-tailed) > 0.05 means accept H0

Results:

(a) There is significant difference between people who view the stock information via SMS and those who view the stock information via WAP or GPRS in attitude of performance, features, reputation, reliability, and responsiveness.

(b) There is no significant difference between people who view the stock information via SMS and those who view the stock information via WAP or GPRS in attitude of durability, serviceability, and aesthetics.

Table 4.6. T-Test of Customer's attitude of quality dimensions between those who trade stock via mobile phone and those who have not.

Variable	Group Range	Mean	Standard Deviation	t	Sig. (2-tailed)
Performance	Yes	4.0702	0.56251	2.708	0.007
	No	3.7994	0.71680	3.205	0.002
Features	Yes	4.2807	0.70088	3.324	0.001
	No	3.9321	0.73503	3.437	0.001
Reliability	Yes	3.5088	0.75882	1.976	0.049
	No	3.2994	0.73388	1.931	0.057
Durability	Yes	4.2982	0.90564	2.417	0.016
	No	3.9630	0.97580	2.547	0.013
Serviceability	Yes	3.2807	0.72591	2.329	0.020
	No	3.0370	0.72879	2.336	0.022
Responsiveness	Yes	3.7193	0.72591	1.793	0.074
	No	3.5247	0.76048	1.853	0.068
Aesthetics	Yes	4.0526	0.8111	1.961	0.051
	No	3.8333	0.77300	1.895	0.062
Reputation	Yes	4.2632	0.61314	4.587	0.000

Table 4.6. T-Test of Customer's attitude of quality dimensions between those who trade stock via mobile phone and those who have not (Continued).

Variable	Group Range	Mean	Standard Deviation	t	Sig. (2-tailed)
	No	3.9198	0.50359	3.998	0.000

H0 There is no significant difference between those who trade stock via mobile phone and those who do not.

H1 There is significant difference between those who trade stock via mobile phone and those who do not.

If value of sig.(2-tailed) > 0.05 means accept H0

Results:

(a) There is significant different between those who trade stock via mobile phone and those who do not in attitude of durability, performance, features, reputation, reliability, and serviceability.

(b) There is no significant different between those who trade stock via mobile phone and those who do not in attitude of responsiveness and aesthetics.

Results of Table 4.4 to 4.6 can be summarized as follows:

(1) Between aged groups of 15-34 years and 35 years and above, they perceive factors of quality dimensions as durability, performance, reliability, serviceability, responsiveness, and aesthetics in different ways.

(2) Between people who view the stock information via SMS and those who view the stock information via WAP/GPRS, they perceive factors of quality

dimensions as performance, features, reputation, reliability, and responsiveness in different ways.

(3) Between people who trade stock via mobile phone and those who do not in attitude of durability, performance, features, reputation, reliability, and serviceability in different ways.

According to hypothesis testing results, I conclude that group of 15-34 years views differently in durability, performance, reliability, serviceability, responsiveness, and aesthetics. Among these factors, there is only one similar overlapping factor (Item 2) that is promptness. It implies that customers think they will receive the stock information from PRS (Price Reporting System) in REAL-TIME when they request to view it via mobile phone.

Among eight dimensions of design quality, there are some overlapping factors-performance, features, reputation, and reliability. It implies that the customers who view the stock information think that these factors affect the decision in using mobile stock service whether SMS or WAP/GPRS. Also, whether these factors can affect their decision in trading stock or not.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Research Summary

Mobile Stock Service is the new way for stock investors in order to view the stock information or trade the stock easier via their Mobile Phone. This service emphasizes on three major criteria: accuracy, speed, and convenience. The service can benefit among customers, service providers, and network operators. It is the new way for the new generation of stock investors who are familiar with new technology such as Internet and mobile phones to view the stock information, or buying and selling transaction via their mobile phones.

The objectives of the research are mainly to investigate the customer's attitude toward Mobile Stock Service. The findings will be profitable to mobile application developer, service providers, and network operators in order to improve the service area that still does not meet the customer's expectation.

Consumer's perception can define the ways of experiencing product or services. Generally, consumers make decisions based on what they perceive. Attitude can be performed to extend the personal interpretation since it is one of the psychological factors. Unlike the products, services should be controlled by special efforts to ensure the quality at all time. Thus, the customer's attitude can influence the customer behavior.

The descriptive research is designed to describe the service phenomena and to determine factors influencing the service implementation. Summated rating scale is used in survey instrument to collect data from respondents. SPSS data processing is used in analyzes.

5.2 Conclusion of Findings

The research is focused on the stock investors who are using this service, Therefore, the successful or failure is measured by the percentages of people who either view the stock information or trade stock via mobile phone, or both of them. From the research's result, it seems most people still prefer to view the stock information both via SMS and GPRS rather than use their mobile phone to trade the stock.

Both internal factors and external factors can support the success or failure of this service as well. After analyzing the selected variables, the promotion is viewed as the most concerning factor. It implies that the promotion will be able to attract the customers to use this service more. In this point, the external factor such as the current situation of economic can impact the service also. Because during this time, there are no stock investors who would like to trade the stock or hold their stock investment because of economic crisis. This situation might result in the decreasing number of stock investors who will access the system to view the stock information or trade the stock.

Consumers agree that they receive the accurate stock information from Price Reporting System at Stock Exchange of Thailand in Real-Time. They also believe that they still can use their mobile phone to view the stock information and use for stock trading in the future. Finally, they accept that this service will help them save time to go to stock market by themselves or station in front of the Internet all day long. It is quite consistent to the objectives of this service: Accuracy, Promptness, and Convenience.

Consumers still are not satisfied with the aesthetics of application because they think the service provides insufficient of stock information to support their decision making in trading stock. They are not ensured that the service can be accessed every time they want and sometimes they receive the late response both via SMS, WAP, or GPRS. Though they believe in the reputation of broker companies and the commission

the broker charge (0.21%) when the stock investors selling transaction online is lower than traditional way (0.25%), but they still don't trade stock via their mobile phone because they are afraid of unreliable system and security technology. Also, most respondents think that the price of this service is not reasonable.

Among eight dimensions of quality, reputation is viewed as the most important criteria and serviceability performed as the least important one. Reputation and Serviceability are grouped by combining more than one variable. Reputation consists of Credibility, Security, and Promotion. Serviceability contains Promptness and Serviceability.

The project studies the opportunities that the services will benefit the customers in relation to the service provider's objective. To determine the future trend of the services, it requires testing the following hypothesis:

Target customer of service providers is the person who are between 15-35 years. The research finds that people who are 15-35 years and 35 years and above have significant difference in attitude of durability, performance, reliability, serviceability, responsiveness, and aesthetics. It also shows that there is a significant difference in customer's attitude of quality dimensions between people who view the stock information via SMS and WAP or GPRS in attitude of performance, features, reputation, reliability, and responsiveness. Between those who trade stock via mobile phone and those who do not, has significant difference in attitude of durability, performance, features, reputation, reliability, and serviceability as well.

5.3 Recommendations

It is more difficult to evaluate the quality of services than products. Services have different characteristics from products. The actual quality of services can be measured

in many different ways. The effective service marketing requires the understanding of consumer behavior.

In order to sustain in the market, each service provider should have clear marketing focus to differentiate one's services from the others. So, the marketers should develop appropriate marketing strategies to create impressive brand image.

From the frequency table and bar chart, it is found that there are only 15% of the respondents who trade the stock via mobile phone. The author thinks if this service would like to be successful in the market, the numbers of respondents who trade the stock via mobile phone have to increase more.

After studying the consumer's perception of the services, the author concludes that this service can reach its objectives. Three fundamental factors indicate to provide convenience, promptness, and accuracy to the customers. Consumers think that they receive the accuracy stock information in real-time from stock market. They also think that the mobile phone can provide them more convenience in viewing the stock information and trading stock. .

The author will recommend the strategy based on factors analysis as follows:

(a) Product. The mobile application developers should launch the new version of application that is embedded with special functions.

(b) Price. The network operators should think about the price that is currently setting because most respondents disagree. They probably divide customers which have the high usage rate and offer them the extra rate charge from the service or set the economy package of extra service charge for the stock investors who always use this service such as reduce the price of logging into main menu from 5 baht to 3 baht for 12 months when they launched the promotion in each month.

(c) Promotion. Though the most respondents prefer to get free mobile phone, nevertheless, the findings show that the respondents seem to be price-sensitive because they disagree with the current price. The network operators should co-ordinate with service providers to launch the promotion to increase the usage rate of customers as well e.g. if they use more, they will have chance to use free in the next one month or three months, and so on.

Hypothesis testing is used to compare the relationship between two sampling groups and the quality of services perceived. The service providers set their target market to consumers with aged under 35 year. It shows that the service provider should pay more attention to durability, performance, reliability, serviceability, responsiveness, and aesthetics for each age group. That means the service provider should provide the application that has the menu to request stock information for use and sufficient information. The network operator should provide the reliable system to gain more confidence to the customers whether that they can access into the system everytime they want.

APPENDIX A

OUTPUT OF SPSS PROGRAM

แบบสอบถาม

วัตถุประสงค์ คำตอบจากแบบสอบถามนี้ จะถูกนำไปใช้ในการวิจัยเพื่อตอบคำถามเกี่ยวกับความรู้สึกนึกคิดของผู้บริโภคที่มีต่อ "บริการดูและซื้อขายหุ้นผ่านมือถือ"

คำชี้แจงเกี่ยวกับแบบสอบถาม

แบบสอบถามนี้เป็นส่วนหนึ่งของการทำวิจัยศึกษาระดับปริญญาโท ภาควิชาการจัดการวิศวกรรมคอมพิวเตอร์ มหาวิทยาลัยอัสสัมชัญ (Master of Science in Computer and Engineering Management- Assumption University)

ขอขอบคุณทุกท่านที่ให้ความร่วมมือในการตอบคำถาม และข้อมูลที่ท่านให้จะไม่ถูกนำไปเปิดเผยโดยไม่ได้รับอนุญาต

แบบสอบถามฉบับนี้แบ่งเป็น 2 ส่วนดังนี้

ส่วนที่ 1 เกี่ยวกับรายละเอียดของผู้ตอบแบบสอบถาม

ส่วนที่ 2 เกี่ยวกับความรู้สึกนึกคิดของผู้บริโภคต่อการบริการ

คำตอบแต่ละข้อใช้เพียงเพื่อวิจัยเกี่ยวกับความรู้สึกนึกคิดของผู้บริโภค จึงไม่มีข้อใดถูกหรือผิด เพื่อประโยชน์ในการทำวิจัย ขอความกรุณาท่านได้โปรดตอบคำถามทุกข้อ

ส่วนที่ 1 ข้อมูลส่วนตัว

1. เพศ

a. หญิง b. ชาย

2. อายุ

a. ต่ำกว่า 15 ปี b. 15-24 ปี

c. 25-34 ปี d. ตั้งแต่ 35 ปีขึ้นไป

3. การศึกษา

a. ต่ำกว่าปริญญาตรี b. ปริญญาตรี

c. ปริญญาโท d. สูงกว่าปริญญาโท

4. อาชีพ

a. รับราชการ b. พนักงานรัฐวิสาหกิจ

c. พนักงานเอกชน d. ธุรกิจส่วนตัว

e. อื่นๆ โปรดระบุ _____

5. รายได้ต่อเดือน

a. น้อยกว่า 50,000 บาท b. 50,000-80,000 บาท

c. 80,000-100,000 บาท d. มากกว่า 100,000 บาท

6. โดยปกติแล้ว คุณใช้บริการดูหุ้นผ่านมือถือทางใด

a. SMS b. WAP

c. GPRS

7. คุณใช้บริการซื้อขายหุ้นผ่านมือถือหรือไม่

a. ใช้ b. ไม่ใช้

8. คุณคิดว่าควรมีโปรโมชั่นใดบ้างที่สามารถดึงดูดให้คุณใช้บริการดูหุ้นหรือซื้อขายหุ้นผ่านมือถือ

a. ใช้บริการมาก ลุ้นรับสิทธ์ดูหุ้นผ่านมือถือไม่ว่าจะทางใด (SMS, WAP, GPRS) โดยไม่เสียค่าบริการในระยะเวลาหนึ่ง (เช่น 1เดือน, 3 เดือน)

b. ใช้บริการมาก ลุ้นรับสิทธ์ได้รับมือถือที่สนับสนุนบริการดูและซื้อขายหุ้นผ่านมือถือเช่น สนับสนุน JAVA, WAP, GPRS หรือ Smart Phone ฟรี

c. ใช้บริการมาก มีสิทธิ์เข้าร่วมสัมมนาเกี่ยวกับการซื้อขายหุ้น ดูหุ้นผ่านมือถือ หรือผ่านเทคโนโลยีใหม่ๆ ตลอดชีพ

d. อื่นๆ (โปรดระบุ) _____

ส่วนที่ 2 ทัศนคติต่อบริการ Mobile Stock Service

(หมายเหตุ: 5 = เห็นด้วยอย่างยิ่ง, 4 = เห็นด้วย, 3 = ไม่แน่ใจ, 2 = ไม่เห็นด้วย, 1 = ไม่เห็นด้วยอย่างยิ่ง)

2.1	โดยเฉลี่ยแล้ว คุณคิดว่าข้อมูลหุ้นที่คุณได้รับถูกต้องแม่นยำ	5	4	3	2	1
2.2	โดยเฉลี่ยแล้ว คุณคิดว่าข้อมูลที่คุณได้รับเป็นข้อมูลที่ทันเหตุการณ์ (Real-time) จากตลาดหลักทรัพย์แห่งประเทศไทยในขณะนั้นๆ	5	4	3	2	1
2.3	คุณมั่นใจว่าข้อมูลหุ้นที่คุณได้รับจากการเรียกดูผ่านโทรศัพท์มือถือสามารถช่วยในการตัดสินใจลงทุนได้เป็นอย่างดี	5	4	3	2	1
2.4	คุณมั่นใจว่าคุณสามารถเรียกดูข้อมูลหุ้นได้ในขณะที่ระบบมีผู้ใช้บริการจำนวนมาก	5	4	3	2	1
2.5	คุณมั่นใจว่าในอนาคตคุณยังคงสามารถใช้โปรแกรมดูหุ้นผ่านมือถือได้	5	4	3	2	1
2.6	คุณมั่นใจว่าโดยปกติแล้วจะไม่มีข้อผิดพลาดของระบบในขณะเรียกดูข้อมูลหุ้นหรือสั่งซื้อหุ้น	5	4	3	2	1
2.7	คุณคิดว่าคุณได้รับข้อมูลที่คุณเรียกดูได้อย่างรวดเร็วฉับไว (เช่น การตอบกลับของระบบ SMS, เวลาในการ load ของข้อมูลในแต่ละหน้า)	5	4	3	2	1
2.8	คุณคิดว่าเมนูคำสั่งในโปรแกรมเรียกดูหุ้นและซื้อขายที่ใช้อยู่ในขณะนี้ใช้งานได้อย่างสะดวก และครอบคลุมข้อมูลที่จะเรียกดูทุกอย่าง	5	4	3	2	1
2.9	คุณคิดว่าบริษัทหลักทรัพย์ (Broker) ที่โปรแกรมเรียกดูหุ้นและซื้อขายหุ้นเปิดให้บริการอยู่ในขณะนี้เป็นบริษัทที่มีความน่าเชื่อถือ สร้างความเชื่อมั่นของคุณในการลงทุนได้	5	4	3	2	1
2.10	คุณคิดว่าคุณสามารถซื้อขายหุ้นได้อย่างปลอดภัยภายใต้เทคโนโลยีความปลอดภัยของบริการ ซื้อขายหุ้นผ่านมือถือ	5	4	3	2	1
2.11	คุณมั่นใจว่าบริการนี้ช่วยทำให้การดูข้อมูลหุ้นและซื้อขายหุ้นในชีวิตประจำวันของคุณเป็นไปได้อย่างสะดวกยิ่งขึ้น (เช่น ลดการเสียเวลาในการไปตลาดหลักทรัพย์ด้วยตนเอง หรือนั่งหน้าจอคอมพิวเตอร์ตลอดเวลา, ลดการต้องติดต่อเจ้าหน้าที่ทางการตลาดด้วยตนเอง)	5	4	3	2	1

2.12	คุณมั่นใจว่าราคาในการใช้บริการดูหุ้นผ่านมือถือที่คุณใช้อยู่ เป็นราคาที่เหมาะสม (SMS: 3 บาท/ครั้ง, WAP: 3 บาท/1 นาที, GPRS: 5 Baht/ 1 ครั้งที่เข้าบริการ และ ค่า GPRS 1 บาท/นาที)	5	4	3	2	1
2.13	คุณมั่นใจว่าราคาคอมมิชชั่นในการซื้อขายหุ้นผ่านมือถือในขณะนี้เป็นราคาที่เหมาะสม (อัตรา 0.21%)	5	4	3	2	1
2.14	คุณคิดว่าถ้ามีโปรโมชั่นตามข้อ 11 ของส่วนที่ 1 จะสามารถดึงดูดให้คุณเข้ามาใช้บริการดูหุ้นหรือซื้อขายหุ้นผ่านมือถือมากขึ้น	5	4	3	2	1

Table A.1. Frequency-Personal Information.

Sex

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	female	195	51.2	51.2	51.2
	male	186	48.8	48.8	100.0
	Total	381	100.0	100.0	

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15-24yrs	84	22.0	22.0	22.0
	25-34yrs	195	51.2	51.2	73.2
	35 upwards	102	26.8	26.8	100.0
	Total	381	100.0	100.0	

Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than Bachelor Degree	4	1.0	1.0	1.0
	Bachelor Degree	165	43.3	43.3	44.4
	Master Degree	187	49.1	49.1	93.4
	More than Bachelor Degree	25	6.6	6.6	100.0
	Total	381	100.0	100.0	

Occupation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	State enterprises	89	23.4	23.4	23.4
	Private companies	207	54.3	54.3	77.7
	Own business	59	15.5	15.5	93.2
	Others	26	6.8	6.8	100.0
	Total	381	100.0	100.0	

Income Per month

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 50,000	204	53.5	53.5	53.5
	50,000-80,000	73	19.2	19.2	72.7
	80,000-100,000	42	11.0	11.0	83.7
	more than 100,000	62	16.3	16.3	100.0
	Total	381	100.0	100.0	

View Stock Info via Mobile

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	SMS	156	40.9	40.9	40.9
	WAP	49	12.9	12.9	53.8
	GPRS	176	46.2	46.2	100.0
	Total	381	100.0	100.0	

Trade Stock via Mobile

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	57	15.0	15.0	15.0
	no	324	85.0	85.0	100.0
	Total	381	100.0	100.0	

Promotion

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Free some period	114	29.9	29.9	29.9
	Free Mobile Phone	142	37.3	37.3	67.2
	Free Seminar	103	27.0	27.0	94.2
	Others	22	5.8	5.8	100.0
	Total	381	100.0	100.0	

Table A.2. Frequency Table-Attitudes Towards Mobile Stock Service.

Accuracy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.3	.3	.3
	Disagree	22	5.8	5.8	6.0
	Neutral	84	22.0	22.0	28.1
	Agree	212	55.6	55.6	83.7
	Strongly Agree	62	16.3	16.3	100.0
	Total	381	100.0	100.0	

Promptness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.3	.3	.3
	Disagree	43	11.3	11.3	11.5
	Neutral	120	31.5	31.5	43.0
	Agree	161	42.3	42.3	85.3
	Strongly Agree	56	14.7	14.7	100.0
	Total	381	100.0	100.0	

Features

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	3	.8	.8	.8
	Disagree	68	17.8	17.8	18.6
	Neutral	148	38.8	38.8	57.5
	Agree	135	35.4	35.4	92.9
	Strongly Agree	27	7.1	7.1	100.0
	Total	381	100.0	100.0	

Reliability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	1.6	1.6	1.6
	Disagree	101	26.5	26.5	28.1
	Neutral	132	34.6	34.6	62.7
	Agree	119	31.2	31.2	94.0
	Strongly Agree	23	6.0	6.0	100.0
	Total	381	100.0	100.0	

Durability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	1.6	1.6	1.6
	Disagree	17	4.5	4.5	6.0
	Neutral	90	23.6	23.6	29.7
	Agree	121	31.8	31.8	61.4
	Strongly Agree	147	38.6	38.6	100.0
	Total	381	100.0	100.0	

Serviceability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.3	.3	.3
	Disagree	102	26.8	26.8	27.0
	Neutral	161	42.3	42.3	69.3
	Agree	110	28.9	28.9	98.2
	Strongly Agree	7	1.8	1.8	100.0
	Total	381	100.0	100.0	

Responsiveness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	8	2.1	2.1	2.1
	Disagree	115	30.2	30.2	32.3
	Neutral	124	32.5	32.5	64.8
	Agree	127	33.3	33.3	98.2
	Strongly Agree	7	1.8	1.8	100.0
	Total	381	100.0	100.0	

Asthetics

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	6	1.6	1.6	1.6
	Disagree	71	18.6	18.6	20.2
	Neutral	154	40.4	40.4	60.6
	Agree	141	37.0	37.0	97.6
	Strongly Agree	9	2.4	2.4	100.0
	Total	381	100.0	100.0	

Credibility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	2	.5	.5	.5
	Disagree	39	10.2	10.2	10.8
	Neutral	153	40.2	40.2	50.9
	Agree	176	46.2	46.2	97.1
	Strongly Agree	11	2.9	2.9	100.0
	Total	381	100.0	100.0	

Security

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	7	1.8	1.8	1.8
	Disagree	49	12.9	12.9	14.7
	Neutral	157	41.2	41.2	55.9
	Agree	133	34.9	34.9	90.8
	Strongly Agree	35	9.2	9.2	100.0
	Total	381	100.0	100.0	

Convenience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Disagree	30	7.9	7.9	7.9
	Neutral	73	19.2	19.2	27.0
	Agree	159	41.7	41.7	68.8
	Strongly Agree	119	31.2	31.2	100.0
	Total	381	100.0	100.0	

Price

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	66	17.3	17.3	17.3
	Disagree	133	34.9	34.9	52.2
	Neutral	85	22.3	22.3	74.5
	Agree	84	22.0	22.0	96.6
	Strongly Agree	13	3.4	3.4	100.0
	Total	381	100.0	100.0	

Service Charge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	44	11.5	11.5	11.5
	Disagree	154	40.4	40.4	52.0
	Neutral	97	25.5	25.5	77.4
	Agree	80	21.0	21.0	98.4
	Strongly Agree	6	1.6	1.6	100.0
	Total	381	100.0	100.0	

Promotion

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly Disagree	1	.3	.3	.3
	Neutral	57	15.0	15.0	15.2
	Agree	206	54.1	54.1	69.3
	Strongly Agree	117	30.7	30.7	100.0
	Total	381	100.0	100.0	

Table A.3. Crosstabs.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
View Stock Info via Mobile * Income Per month	381	100.0%	0	.0%	381	100.0%

View Stock Info via Mobile * Income Per month Crosstabulation

			Income Per month				Total
			less than 50,000	50,000-80,000	80,000-100,000	more than 100,000	
View Stock Info via Mobile	SMS	Count	92	24	16	24	156
		% within View Stock Info via Mobile	59.0%	15.4%	10.3%	15.4%	100.0%
	WAP	Count	30	8	2	9	49
		% within View Stock Info via Mobile	61.2%	16.3%	4.1%	18.4%	100.0%
	GPRS	Count	82	41	24	29	176
		% within View Stock Info via Mobile	46.6%	23.3%	13.6%	16.5%	100.0%
Total		Count	204	73	42	62	381
		% within View Stock Info via Mobile	53.5%	19.2%	11.0%	16.3%	100.0%

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Promotion * Sex	381	100.0%	0	.0%	381	100.0%
Promotion * Age	381	100.0%	0	.0%	381	100.0%

Promotion * Sex Crosstabulation

			Sex		Total
			female	male	
Promotion	Free some period	Count	64	50	114
		% within Promotion	56.1%	43.9%	100.0%
	Free Mobile Phone	Count	76	66	142
		% within Promotion	53.5%	46.5%	100.0%
	Free Seminar	Count	52	51	103
		% within Promotion	50.5%	49.5%	100.0%
	Others	Count	3	19	22
		% within Promotion	13.6%	86.4%	100.0%
Total		Count	195	186	381
		% within Promotion	51.2%	48.8%	100.0%

Promotion * Age Crosstabulation

			Age			Total
			15-24yrs	25-34yrs	35 upwards	
Promotion	Free some period	Count	23	67	24	114
		% within Promotion	20.2%	58.8%	21.1%	100.0%
	Free Mobile Phone	Count	38	67	37	142
		% within Promotion	26.8%	47.2%	26.1%	100.0%
	Free Seminar	Count	20	56	27	103
		% within Promotion	19.4%	54.4%	26.2%	100.0%
	Others	Count	3	5	14	22
		% within Promotion	13.6%	22.7%	63.6%	100.0%
Total		Count	84	195	102	381
		% within Promotion	22.0%	51.2%	26.8%	100.0%

Table A.4. Descriptive Means among 14 variables.

Descriptive Statistics

	N	Sum	Mean	Std. Deviation	Variance
Accuracy	381	1455	3.82	.779	.607
Promptness	381	1371	3.60	.882	.778
Features	381	1258	3.30	.871	.759
Reliability	381	1195	3.14	.930	.866
Durability	381	1529	4.01	.972	.945
Serviceability	381	1163	3.05	.800	.639
Responsiveness	381	1153	3.03	.891	.794
Asthetics	381	1219	3.20	.822	.676
Credibility	381	1298	3.41	.733	.537
Security	381	1283	3.37	.886	.786
Convenience	381	1510	3.96	.905	.820
Price	381	988	2.59	1.112	1.237
Service Charge	381	993	2.61	.993	.987
Promotion	381	1581	4.15	.678	.459
Valid N (listwise)	381				

Means of quality dimensions

Descriptive Statistics

	N	Sum	Mean	Std. Deviation	Variance
Performance	381	3979.00	10.4436	1.95478	3.821
Features	381	4164.00	10.9291	2.02425	4.098
Reliability	381	2358.00	6.1890	1.41272	1.996
Durability	381	1529.00	4.0131	.97189	.945
Serviceability	381	2151.00	5.6457	1.39092	1.935
Response	381	2524.00	6.6247	1.41359	1.998
Aesthetics	381	2748.00	7.2126	1.40092	1.963
Reputation	381	4162.00	10.9239	1.44075	2.076
Valid N (listwise)	381				

Means of relating factors

Descriptive Statistics

	N	Sum	Mean	Std. Deviation	Variance
Product	381	14434.00	37.8845	5.86087	34.350
PRIC1	381	1981.00	5.1995	1.77025	3.134
Promotion	381	1581.00	4.1496	.67760	.459
Valid N (listwise)	381				

Table A.5. Factor Analysis.

Communalities

	Initial	Extraction
Accuracy	1.000	.718
Promptness	1.000	.754
Features	1.000	.524
Reliability	1.000	.395
Durability	1.000	.387
Serviceability	1.000	.415
Responsiveness	1.000	.516
Asthetics	1.000	.511
Credibility	1.000	.297
Security	1.000	.521
Convenience	1.000	.555
Price	1.000	.674
Service Charge	1.000	.633
Promotion	1.000	2.807E-02

Extraction Method: Principal Component Analysis.

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.346	31.046	31.046	4.346	31.046	31.046
2	1.361	9.720	40.765	1.361	9.720	40.765
3	1.222	8.728	49.494	1.222	8.728	49.494
4	1.184	8.459	57.953			
5	.960	6.857	64.810			
6	.903	6.450	71.260			
7	.682	4.873	76.133			
8	.666	4.756	80.889			
9	.599	4.280	85.170			
10	.545	3.895	89.065			
11	.477	3.409	92.474			
12	.405	2.889	95.363			
13	.351	2.505	97.868			
14	.298	2.132	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component		
	1	2	3
Accuracy	.640	-1.43E-02	.555
Promptness	.689	-2.02E-02	.528
Features	.602	-.114	.386
Reliability	.628	-2.92E-02	-1.74E-02
Durability	.551	3.142E-02	-.287
Serviceability	.590	-.246	-8.02E-02
Responsiveness	.635	-.211	-.260
Asthetics	.638	-.201	-.253
Credibility	.538	-8.51E-02	2.579E-02
Security	.590	-6.42E-02	-.411
Convenience	.652	.245	-.264
Price	.204	.794	-3.34E-02
Service Charge	.369	.705	2.385E-02
Promotion	-6.07E-02	-2.56E-02	.154

Extraction Method: Principal Component Analysis.

a. 3 components extracted.

Means of quality dimensions

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Performance	381	4.00	14.00	10.4436	1.95478
Features	381	6.00	15.00	10.9291	2.02425
Reliability	381	3.00	9.00	6.1890	1.41272
Durability	381	1.00	5.00	4.0131	.97189
Serviceability	381	3.00	10.00	5.6457	1.39092
Response	381	3.00	10.00	6.6247	1.41359
Aesthetics	381	4.00	10.00	7.2126	1.40092
Reputation	381	6.00	15.00	10.9239	1.44075
Valid N (listwise)	381				

Means of quality dimensions (Rearrange)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Performance	381	2.00	5.00	3.8399	.70194
Features	381	2.00	5.00	3.9843	.73968
Reliability	381	2.00	5.00	3.3307	.74043
Durability	381	1.00	5.00	4.0131	.97189
Serviceability	381	2.00	5.00	3.0735	.73259
Response	381	2.00	5.00	3.5538	.75767
Aethetics	381	2.00	5.00	3.8661	.78165
Reputation	381	2.00	5.00	3.9711	.53480
Valid N (listwise)	381				

Means of Factor Analysis

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Product	381	19.00	52.00	37.8845	5.86087
Price	381	2.00	10.00	5.1995	1.77025
Promotion	381	1.00	5.00	4.1496	.67760
Valid N (listwise)	381				

Means of Factor Analysis (Rearrange)

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Product	381	2.00	5.00	3.8819	.61491
Price	381	1.00	5.00	2.7769	.90617
Promotion	381	1.00	5.00	4.1496	.67760
Valid N (listwise)	381				

Table A.6. T-Test: Trade Stock Via Mobile Phone VS Quality Dimensions.

Group Statistics

	Trade Stock via Mobile	N	Mean	Std. Deviation	Std. Error Mean
Durability	yes	57	4.2982	.90564	.11995
	no	324	3.9630	.97580	.05421
Performance	yes	57	4.0702	.56251	.07451
	no	324	3.7994	.71680	.03982
Features	yes	57	4.2807	.70088	.09283
	no	324	3.9321	.73503	.04083
Reputation	yes	57	4.2632	.61314	.08121
	no	324	3.9198	.50359	.02798
Reliability	yes	57	3.5088	.75882	.10051
	no	324	3.2994	.73388	.04077
Serviceability	yes	57	3.2807	.72591	.09615
	no	324	3.0370	.72879	.04049
Response	yes	57	3.7193	.72591	.09615
	no	324	3.5247	.76048	.04225
Aethetics	yes	57	4.0526	.81111	.10743
	no	324	3.8333	.77300	.04294

Table A.7. T-Test: View Stock Information Via Mobile Phone VS Quality Dimensions.

Group Statistics

	view via mobile	N	Mean	Std. Deviation	Std. Error Mean
Durability	1.00	156	3.9423	.82884	.06636
	2.00	225	4.0622	1.05883	.07059
Performance	1.00	156	3.6667	.67521	.05406
	2.00	225	3.9600	.69642	.04643
Features	1.00	156	3.8846	.70903	.05677
	2.00	225	4.0533	.75404	.05027
Reputation	1.00	156	3.8974	.52277	.04185
	2.00	225	4.0222	.53822	.03588
Reliability	1.00	156	3.1667	.70787	.05667
	2.00	225	3.4444	.74269	.04951
Serviceability	1.00	156	3.0321	.76555	.06129
	2.00	225	3.1022	.70915	.04728
Response	1.00	156	3.4038	.69819	.05590
	2.00	225	3.6578	.78105	.05207
Aethetics	1.00	156	3.8141	.70760	.05665
	2.00	225	3.9022	.82875	.05525

Table A.8. T-Test: Age VS Quality Dimensions.

Group Statistics

	Age	N	Mean	Std. Deviation	Std. Error Mean
Durability	1.00	279	4.1398	.88054	.05272
	2.00	102	3.6667	1.11988	.11088
Performance	1.00	279	3.9032	.67958	.04069
	2.00	102	3.6667	.73570	.07285
Features	1.00	279	4.0323	.68043	.04074
	2.00	102	3.8529	.87197	.08634
Reputation	1.00	279	3.9857	.55601	.03329
	2.00	102	3.9314	.47219	.04675
Reliability	1.00	279	3.3871	.71014	.04251
	2.00	102	3.1765	.80113	.07932
Serviceability	1.00	279	3.1219	.71935	.04307
	2.00	102	2.9412	.75549	.07480
Response	1.00	279	3.6165	.72460	.04338
	2.00	102	3.3824	.82106	.08130
Aethetics	1.00	279	3.9749	.74144	.04439
	2.00	102	3.5686	.81459	.08066

BIBLIOGRAPHY

English Reference

1. Russell, Roberta S. and Bernard W. Taylor, III. Operations Management: Multimedia Version, 4th Edition. NJ. Prentice-Hall International Company, 2002

2. Chase, Aquilano, and Jacobs. Production and Operations Management: Manufacturing and Services, 8th Edition. NY: McGraw-Hill Publishing Company, 1998

3. William G. Zigmund, Business Research Methodology, 2000

4. Douglas A.Lind, William G. Marchal, and Samuel A. Wathen. Basic Statistics for Business & Economics, 4th Edition. NY: McGraw-Hill Publishing Company, 2002

5. Philip Kotler. Marketing Management, 11th Edition. NJ. Prentice-Hall International Company, 2003.

6. William D. Perreault, Jr., Jerome McCarthy: Basic Marketing: International Edition, NY: McGraw-Hill Publishing Company, 1999

Thai References

1. จิรเดช พูนมโนธรรม. รวยด้วยมือถือ, กรุงเทพมหานคร: A TEAM BUSINESS LIMITED, PART., 2546

2. นิตยสาร มาร์เก็ตเธียร์, กรุงเทพมหานคร: บริษัท อินเทลลิเจ้นท์ มัลติมีเดีย จำกัด, เมษายน 2547

3. นิตยสาร E-Commerce, กรุงเทพมหานคร: บริษัท มีเดีย แอสโซซิเอ็ดเตด จำกัด, มกราคม 2547

Website References

1. http://www.mfsenterprise.co.th

2. http://www.settrade.com

3. http://www.hutch.co.th/h_press_MxBroker_en.htm

4. http://www.shinee.com

5. http://www.mobilelife.co.th

6. http://www.gotomanager.com

7. http://www.businessthai.com