THE INFLUENCE OF INFORMATION SEARCH, INVOLVEMENT AND LOYALTY ON SWITCHING BEHAVIOR: A CASE STUDY OF DTAC MOBILE PHONE USERS IN BANGKOK AREA

By

USANEE KASEMKIATSANTI

A Thesis submitted in partial fulfillment
of the requirement for the degree of

Master of Business Administration

Graduate School of Business
Assumption University
Bangkok, Thailand

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ABSTRACT

Owing to the rapidly changing environment and intense competition in Thailand's mobile phone industry, an issue of concern is customer switching behavior among mobile phone service providers, owing to the fact that switching deteriorates the company's profitability and business viability. Identification of movement in and out of mobile phone users in the marketplace leads to the requirement for the mobile phone service providers, such as DTAC, to develop appropriate customer retention, loyalty-building efforts and acquisition programs. Given these sentiments, understanding of the company's customer base among internal customer groups in terms of sources of information search, involvement and loyalty becomes necessary for DTAC as the first stage of its marketing strategy formulation.

The purpose of this research was to study the influence of sources of information search, involvement and loyalty on switching behavior of DTAC mobile phone users. In addition, the objectives also were to determine the most influential factors of sources of information search, involvement and customer loyalty that distinguish the switchers from non-switchers. The data was collected from 400 DTAC mobile phone users whose age was over 18 years old residing in Bangkok area only. The chi-square test was employed to test the hypotheses.

The results of the research showed that five out of seven studied factors including external information sources, interpersonal information sources, experiential information sources, ego involvement and active loyalty have power to distinguish switchers from non-switchers while another two studied factors comprising purchase

involvement and passive loyalty do not influence discriminating the two groups of DTAC mobile phone users.

The findings provide important implications for DTAC to understand the relationship between switching behavior and the predicting factors composing sources of information search, involvement and customer loyalty, which can serve as a guideline for the company to appropriately develop its marketing strategies, such as advertising program, build-up brand cognition and pricing strategies.

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CHAPTER 1

GENERALITIES OF THE STUDY

This chapter is divided into seven sections as follows: Section one is the introduction illustrating an overview of the mobile telecommunications service industry in Thailand and a brief history of Total Access Communication Public Co.,Ltd. or "DTAC". Section two explains the statement of problem. Section three indicates the objectives of the study. Section four and five indicate the scope and limitations of the study, respectively. Section six determines the significance of the study. The last section provides the definition of terms used in this research.

1.1 Introduction

1.1.1 Overview of Thailand's Mobile Telecommunication Industry

The Telecommunications industry in Thailand is a government monopoly under the full control of the Ministry of Transport and Communications. There are two state enterprises engaged in the Thai telecom market which are: (a) the Telephone Organization of Thailand ('TOT') which is responsible for the domestic market and neighboring countries, and (2) the Communications Authority of Thailand ("CAT") which is responsible for all international services, including telephone, internet and postal services (TGI, 2003).

Owing to the fact that telecommunication is one of the important basic facilities relevant to the development of a country, demand for telephone lines has grown in response to Thailand's fast-track environment (TAC, 2002). Due to the shortage of fixed wired telephone, a perfectly-substitute product, cellular telephone or mobile phone, has become the best alternative for Thai consumers (Vongpanitlerd, 1998). Thus, TOT, in 1986, was the first service operator of the country's mobile phone market using a 470 MHz. Frequency Nordic Mobile Telephone (NMT) followed by CAT, which started its mobile phone services in February 1987 under an Advanced Mobile Phone System (AMPS) 800 MHz. (band A) (www.tot.co.th, visited on March 23, 2004). During the period of 1991 - 1997, the Thai cellular market grew from 0.14 million subscribers to about 2.2 million subscribers, equivalent to a 58.3% growth rate (Vongpanitlerd, 1998).

As expansion of the mobile phone network to accommodate high demand for mobile phone services required huge investments beyond the capabilities of both TOT and CAT, private companies at that time, were brought in to develop mobile phone networks under the model of Build-Transfer-Operate ("BTO") concessions under revenue sharing schemes agreed with the state-owned enterprises who granted the concessions (Corner, 2002). In 1990, Advance Info Service PCL. ("AIS") was the first private company which received the concession from TOT to operate NMT 900 MHz. cellular telephone service, so called "Cellular 900" (AIS, 2004). One year later, Total Access Communication PCL. ("TAC") received the concession from CAT to operate AMPS 800 MHz. (band B), so called WorldPhone 800 (Puenpatom, 1999).

In 1994, both AIS and TAC introduced their new digital mobile phone services under Global System for Mobile Communication ("GSM") 900 MHz. digital and Personal Communications Network ("PCN") 1800 MHz. digital, respectively. Both digital systems were better than analogue services in terms of quality of signal transmission (Puenpatom, 1999).

Apart from the two biggest players in mobile phone industry comprising AIS and TAC, another mobile phone operator who obtained the concession from CAT, was Digital Phone Co.,Ltd. ("DPC"). DPC first operated its mobile phone services under the brand name Hello 1800 and was changed to GSM 1800 after being taken-over by Shin Cooperation PCL and its partner – Telekom Malaysia International Co., Ltd. in February 1998 (www.shinawatra.com). Later, TA Orange Co., Ltd. ("TA-Orange"), a venture between the CP Group of Thailand and Orange of the United Kingdom, entered the market in March 2002, followed by Thai Mobile, a joint venture between TOT and CAT in November 2002 (TAC, 2002). The last operator was Hutchison-CAT, which commenced its services in February 2003 using the Code Division Multiple Access ("CDMA") 2000 1-x technology (www.hutch.co.th, visited on March 11, 2004). This development has taken place as a result of the regulatory reform and liberalization within Thailand's telecom market.

In conclusion, there are now five major mobile phone operators in Thailand whose system, concession and the number of subscribers are shown in Table 1.1.

Table 1.1: Thailand's major mobile phone operators

in million subscribers

Operator	System	Concession granted by	Concession end	No. of subscribers ended 2003*
DTAC	AMPS 800-band B GSM1800	CAT	2018	6.5
AIS	NMT 900 GSM 900	TOT	2016	13.2
DPC	GSM 1800	CAT	2018	0.2
TA-Orange	GSM 1800	CAT	2018	1.6
Hutchison/ CAT	CDMA 800 – band A	CAT	N.A.	0.5

* No. of subscribers includes postpaid and prepaid mobile phone users (as of August 22, 2003)

Sources: TAC's annual report (2003), pp. 28

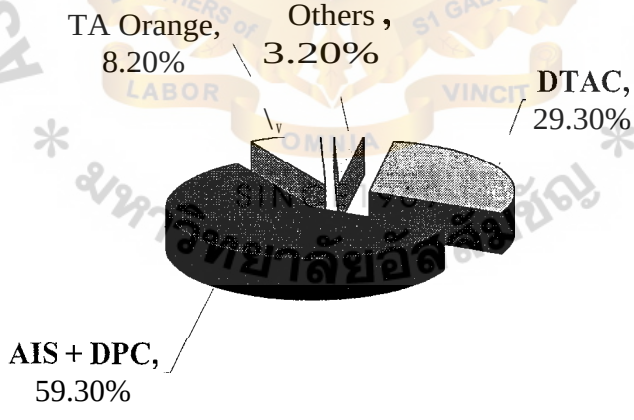
www.AIS.com, visited on March 11, 2004

Table 1.1 shows Thailand's five major mobile phone operators, which operate the mobile phone services under the concession granted by CAT and TOT. Based on the number of subscribers for the year ended 2003, the market leader of mobile phone industry was AIS, which had 13.2 million subscribers.

DTAC was the second largest mobile phone operator having 6.5 million subscribers.

The growth rate of the mobile phone market in 2003 was slower than the previous two years. At the end of 2003, there were 22 million users, a 27% increase from the previous year. Out of 2003's total numbers of users in the market, around 18 million were prepaid users accounting for 81% of the market (TAC, 2003). The 2003's market shares of the major mobile phone operators are shown in Figure 1.1. In 2003, three major mobile phone operators, DTAC, AIS, and TA Orange, had a combined market share of around 95%.

Figure 1.1: Total market share of customers at end of year 2003



Source: TAC's annual report (2003). pp. 29

According to Figure 1.1, AIS and DPC were the market leaders of mobile phone operators in Thailand with a market share of 59.30% for the year 2003.

DTAC and TA-Orange were the second and third having 29.30% and 8.20% market shares, respectively.

Thailand's mobile phone industry is rapidly and dramatically changing in compliance with the World Trade Organization's requirements regarding full liberalization of Thailand's telecommunication markets by year 2006 (Comer, 2002). Following this, stiff competition in the mobile phone market is foreseen when both qualified local and foreign operators are allowed to freely enter and exit the market (TGI, 2003).

Under the liberalization scheme, the mobile phone market has seen increasing competition and many tactics to gain market share, such as, reductions of airtime fee and the unlocking of International Mobile Equipment Identity ('IMEI'). The competition has also evolved from mainly price cutting strategy into product differentiation with various value added-services such as Short Message Service ('SMS') and brand loyalty incentives aiming to capitalize on customer repeat purchase (CAT, 2002).

In conclusion, the mobile phone industry has been driven by many factors including intense competition, new marketing activities, improvement in technology, purchasing power of mobile phone users and change in consumer behavior. Under these conditions, it would be interesting to study the extent to which information search, involvement and loyalty influence the switching behavior of mobile users.

L1.2 Total Access Communication Public Co.,Ltd. ("TAC")

TAC was established in August 1989 by United Communication Industry Plc. to engage in wireless telecommunication services in 800 MHz and 1800 MHz frequency bands. TAC was first granted a 15-year BTO concession period in year 1990. The concession has been extended twice to 27 years altogether until 2018. TAC, in March 2001, launched the new brand "DTAC" under the slogan "DTAC makes it easy". Several promotion programs have continuously been launched in the market such as "MY" postpaid service offering reduced airtime rates for every minute used after 75 minutes, "Happy Dprompt" prepaid service allowing customers to spread the usage during the period of reduced airtime rates (TAC, 2003). Overview of DTAC's background is described in Appendix 1.

1.2 Statement of the Problems

Thailand's mobile phone market in 2003 grew by 35% compared with the previous year. This increased the number of subscribers at the end of 2003 to 23 million or 34% of the population (Bangkok Post, January 3, 2004). Out of total number of 23 million subscribers, TAC had 6.55 million subscribers through its DTAC network (www.Business.com, visited on February 24, 2004).

After enjoying a dramatic growth over the past several years, Thailand's mobile phone market entered a saturation stage as subscriber growth in 2003 rose at a slower pace than the previous year when the growth was 200% (Bangkok Post, mid-year economic review 2003) Following this, the subscriber growth in

2004 is expected to have risen by 15% which was lower than the previous year (Bangkok Post, January 3, 2004). Apart from the declining growth rate of demand, competition among phone operators has intensified because of the entrance of new operators comprising TA Orange and Hutchison and the upcoming full liberalization in 2006 lifting barriers of entry into the industry.

DTAC was particularly selected as a representative of Thai mobile phone services for this research. DTAC, the country's second-largest mobile phone operator, also encountered the same situation when the number of subscribers in November 2003 declined by 18% compared with the previous month (www.dtac.co.th, March 11, 2004). Various innovative services with aggressive promotions have been actively employed to satisfy its customer bases aiming to enhance loyalty and to attract new customers. For example, DTAC launched Happy Dprompt, which offered airtime charges as low as baht 2.50 a minute. In 2002, DTAC was the pioneer in the removal of all phone identity locks or International Mobile Equipment Identity (TAC, 2003).

Customers in the mobile phone industry frequently switch from one operator to another whenever the promotions expire and the industry's intense competition forces the mobile phone operators to implement both pricing and non-pricing strategies. Creating innovative content, value-added services, improving service quality, continuous promotion packages and advertisement are among such strategies. The purpose is to satisfy the existing customer base as well as to attract potential customers. Consequently, appropriate strategies can be

implemented only if the mobile phone operators clearly understand how the information, involvement and loyalty influence the switching behavior of mobile phone users. Thus, the statement of the problem for this research was "What types of functions can distinguish the switchers from non-switchers?"

1.3 Objectives of the Research

The purpose of this research is to provide better understanding of the influence of information search, involvement and customer loyalty on switching behavior of DTAC mobile phone users. This research also identifies what variables of sources of information search, involvement and customer loyalty can distinguish the two groups of DTAC mobile phone users. The research outcome will be employed as guidelines for DTAC in designing and implementing effective acquisition and retention strategies to fit mobile phone users' behavior. Therefore, the objectives of the research were defined as follows:

1. To study whether the two groups of DTAC's mobile phone users differ in their information search, involvement and customer loyalty.
2. To identify what aspects of information search, involvement and customer loyalty distinguish the two groups of DTAC mobile phone users (switchers and non-switchers).

1.4 Scope of the Research

This research examined whether or not the various aspects of information search, involvement and customer loyalty influence the discrimination of the two groups of DTAC mobile phone users (switchers and non-switchers). The target group of this research was DTAC subscribers in Bangkok metropolitan area. The demographic factors in terms of gender, income level, occupation, education level were taken out from consideration. The data was collected by means of self-administered questionnaires.

1.5 Limitations of the Research

1. This research was specifically intended to examine the switching behavior of DTAC mobile phone users with regard to information search, involvement and customer loyalty. Thus, the findings cannot be generalized for other mobile phone operators.
2. This research was conducted over a specific period of time. Thus, the findings cannot be generalized for any other time as the service features, promotion programs and service quality and behavioral characteristics of mobile phone users, which have an impact on the involvement and loyalty, may change in different periods.
3. This research was conducted on respondents residing only in the Bangkok metropolitan area, therefore findings of this research may not be generalized for respondents residing in other geographical areas.

4. Of the total thirty respondents from pilot test survey, the reliability testing was analyzed by using only twenty respondents since the rest were unusable due to missing value. The findings of this reliability test, therefore, cannot be generalized for other researches.

1.6 Significance of the Study

The study investigated the influence of information search, involvement and loyalty on switching behavior of DTAC mobile phone users limited to the Bangkok metropolitan areas. The findings provide the following benefits to DTAC:

1. Understanding of what factors of information search, involvement and customer loyalty influence the discrimination in switching behavior of DTAC mobile phone users (switchers and non-switchers). This definitely will help DTAC to properly develop and implement retention and marketing strategies to fit its customer groups (switchers and non-switchers).

2. The findings provide beneficial information about the attitude and behavior toward DTAC's services which DTAC can use to efficiently manage its budget for suitable promotion campaigns to match each target group's behavior.

3. The results of the research can help DTAC to better analyze its strengths and weaknesses in various operational and marketing areas and enable DTAC to increase the number of new subscribers through an effective acquisition program.

1.7 Definition of Terms

These are the literal meanings of some words used in this research for consistency.

Active loyalty	is defined as customer behavior besides repeat patronage, such as word-of-mouth and expansion of service usage (Ganesh, Arnold & Reynolds, 2000).
Advanced Mobile Phone System ("AMPS") 800 MHz.	is one type of mobile phone system for analogue communication using 800 MHz. frequency (Sritanatorn, 2003).
Attitudinal measure	refers to consumers' overall feelings (i.e. evaluation) about the product and the brand, and their purchase intentions (Schiffman & Kanuk, 2000).
Behavioral measure	refers to a response of observation to promotional stimuli for purchase behavior (Schiffman & Kanuk, 2000).

Build-Transfer-Operate ("BTO")	Private companies are required to build and operate telecommunication networks and provide services on a revenue sharing basis with the state enterprise awarding the concession. Network infrastructure is transferred to the concession-granting state enterprise once it is installed while the concessionaire has the exclusive right to utilize those assets over the term of concession (TGI, 2003).
Communication Authority of Thailand ("CAT")	CAT, which is a government agency under the supervision of the Ministry of Transport and Communications, is responsible for all international services including telephone, internet and postal services (CAT's annual report, 2003).
Code Division Multiple Access ("CDMA"):	is one type of mobile phone systems providing clear signal with disturbance protection. The coverage area is equal to three stations of other mobile systems (www.cattelecom.co.th, visited on March 23, 2004).
Consumer behavior	refers to how individuals make purchasing decisions to spend their available resources, such as time and money, on consumption-related items (Schiffman & Kanuk, 2000).

Customer loyalty	is defined as the relationship between an individual attitude in the direction of an entity (i.e. brand, service) and patronage behavior (Olsen, 2002).
Ego involvement	is defined as an on-going concern for a particular product class based on individual's self concept, values and ego (Ganesh, Arnold & Reynolds, 2000).
Experiential sources of Information	Personal experience with the services and general service-relevant knowledge (Keaveney & Parthasarathy, 2001).
External Sources of Information	refers to impersonal sources or both commercial and public sources of information gotten from outside the customer's social system, which include mass media, advertising, articles, brochures, pamphlets, reviews (Keaveney & Parthasarathy, 2001).
Global System for Mobile Communications ("GSM") 900 MHz	is a standard mobile phone system for digital communications using 900 MHz frequency range (www.tot.or.th visited on March 23, 2004).

Information search	covers consumer buying process when the consumers are looking for reading materials, talking with friends or visiting stores to learn about the products or services (Kotler, 2000).
Interpersonal sources of Information	refers to interpersonal sources of information gotten from communication within the social system or so called 'word-of-mouth communications (Keaveney & Parthasarathy, 2001).
Involvement	is regarded as the perceived level of personal value or interest induced by a stimulus in a specific situation (Arnould, Price & Zinkhan, 2004).
Loyalty	is defined as repeated purchases of specific products or services during a certain period of time (Yi & Jeon, 2003).
Non-switchers	refer to the customers who have experience with only one service provider and never moved to the other service providers (Ganesh, Arnold & Reynolds, 2000).

Passive loyalty	refers to consumer behaviors related to the customers' willingness of repeat patronage with the current service provider and defenselessness to competitive actions (Ganesh, Arnold & Reynolds, 2000).
Purchase Involvement	relates to the concern level of purchase process happened from the need when making purchase decision (Ganesh, Arnold & Reynolds, 2000).
Services	is an intangible performance offered by one party to another. The offering may or may not link with physical products (Kotler, 2000).
Short Message Service ("SMS"):	is considered as one type of value-added service allowing the users to transmit texts and data, both graphics and voice regardless of their location (CAT's annual report, 2002).
Switchers	The customers who terminate using the services from their previous service providers and switch to the current service provider (Keaveney & Parthasarathy, 2001).

Switching Barriers	refers to any elements, which make the consumers confront difficult or costly situations to change service providers (Jones, Mothersbaugh & Beatty, 2000).
Switching Behavior	refers to the behavioral act in switching the current service providers to another one (Ganesh, Arnold & Reynolds, 2000).
Switching Cost	The perceived degree of the additional costs incurred from termination of a relationship with the current service providers and finding out an alternative one (Patterson & Ross, 2003)
Nordic Mobile Telephone ("NMT"):	Signals are transmitted at low frequency to prevent interference where the service area is divided into smaller areas called cells. In each cell, the transmitting and receiving equipment is installed at the base station and connected to the mobile phone exchange and the public switched telephone network. (www.tot.co.th visited on March 23, 2004).

Telephone Organization of Thailand ("TOT")	A government agency under the supervision of Ministry of Transport and Communications, is responsible for the domestic market and neighboring countries (www.tot.co.th, visited on March 23, 2004).
Wireless Application Protocol ("WAP")	is a portable internet that can bring the World Wide Web anytime and anywhere upon request, used to search and access many kinds of information such as entertainment, news, etc. as well as to access e-mail, shopping and banking (TAC, 2000).

CHAPTER 2

REVIEW OF LITERATURE AND RELATED STUDIES

This chapter describes concepts and theories relevant to the conceptual framework of this research with an aim to study the differences between continuers and switchers with regard to the influence of information search, involvement and loyalty. The previous empirical researches, which will be used to review the similarities and/or differences in this research, are also described in this chapter. There are two sections in this chapter comprising the framework of concepts and theories and the previous studies related to the research.

2.1 Framework of Concepts and Theories

The following concepts and theories related to this study are reviewed:

2.1.1 Nature of Service Business

2.1.2 Consumer Behavior in Service Industry

2.1.3 Switching Behavior in Service Industry

2.1.4 Information Influence

2.1.5 Customer Involvement

2.1.6 Loyalty

2.1.1 Nature of Service Business

Taking into consideration DTAC's business activities of mobile phone service operator, it is necessary to first understand the nature of the service business. It is recognized that economies have been dictated by services. For example, the United States' service jobs in 1999 accounted for 78% of the gross domestic product (GDP) and 80% of all jobs (Zeithaml and Biter, 2003). As the demand for a better quality of life has been growing, the focus on manufacturing activities has turned into the era of service-related activities, which is at the heart of the economic revolution across the globe (Lovelock, Wirtz and Keh, 2002). To such extent, services can be either a minor or a major element of the company's business activities, ranging from pure products to pure services (Kotler, 1994).

Terms of services can be defined in many different ways. The following meanings were described by Lovelock, Wirtz & Keh (2002).

- *A service is an act or performance offered by one party to another. Although the process may be tied to a physical product, the performance is essentially intangible and does not usually result in ownership of any of the factors of production.*
- *A service is an economic activity that creates value and provides benefits for customers at a specific time and place, by bringing about a desired change in, or on behalf of, the recipient of the service.*

Kotler (1994) defined that *"A service is any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything. Its production may or may not tied to a physical product."*

Gronroos (2000) mentioned that the basic characteristics of services can be identified as follows:

1. Services are processes relating to activities rather than things
2. Services are at least produced or consumed simultaneously.
3. Customers are involved in the service process.

In conclusion, there are four fundamental characteristics of services as shown in Table 2.1 below.

Table 2.1: The Fundamental Characteristics of Services

Characteristic	Description
Intangibility	- Services cannot be evaluated in advance of use.
Perishability	- Stocks of the service element of the service package cannot be held. - Services need to deal with demand and capacity directly.
Simultaneity	- The customer must be present before the service can take place.
Heterogeneity	- There is inherent variability in the service offered.

Source: Rowley, Jennifer. Managing Quality in Information Services. www.dsir.nic.in, visited on May 31, 2004.

From Table 2.1, the differences between goods and services can be identified with the four fundamental characteristics, which are intangibility,

perishability, simultaneity and heterogeneity. In fact, intangibility is the key factor determining whether an offering is a service or product. Taking into consideration the intangibility characteristic, physical evidence has been employed to evaluate the service before purchasing and to assess satisfaction with the service during and after the consumption period. (Zeithelm and Bitner, 2003). Under the service production process, physical evidence can be used to determine service quality attributes and to build the service experience (Bebko, 2000). Service experience, thus, is directly related to the level of satisfaction, leading to either switching or staying behavior.

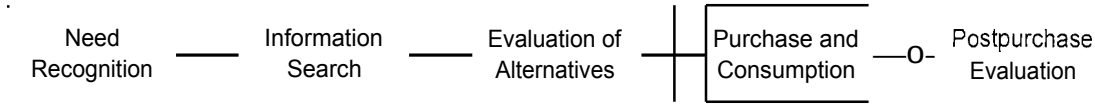
2.1.2 Consumer Behavior in Service Industry

Consumer behavior refers to how an individual spends his or her available resources, such as time and money, on consumption-related items when making purchasing decisions (Schiffman & Kanuk, 2000). Cultural, social, personal, demographic and psychological characteristics influence consumer purchase decisions (Glowa, 2001). The consumer behavior theory widely states that consumers will largely engage in risk-reduction behavior by seeking information about the products or services when the perceived risk increases (Murray, 1991).

Generally, marketing and consumer behaviors illustrate the consumer purchase behavior from the stage of problem recognition, to information search, to evaluation of alternatives, to purchase decision and finally to post-purchase

behavior (Zeithaml & Bitner, 2003). Figure 2.1 shows consumer behavior in relation to the sequence of purchase process for services.

Figure 2.1: Stages in Consumer Decision Making and Evaluation of Services



Source: Zeithaml & Bitner (2003). Service Marketing Integrating Customer Focus Across the Firm (3rd ed.). New York: McGraw-Hill, pp. 37

The first step in Figure 2.1, when the process of buying a service has taken place, is related to the recognition of needs and expectations. Following this, the purchase is regular and low risk, consumers can make their purchase decision quickly. On the other hand, an intensive information search is employed for the first time for usage or high perceived risk. Based on the information on hand, consumers then evaluate alternative service suppliers by reviewing documentation such as brochures, websites, consulting with the other people such as friends and visiting potential service suppliers. In the stage of purchase and consumption, consumers' experience with specific service providers lead to the perceived effectiveness of service encounters. Finally, the consumers evaluate service quality and their (dis)satisfaction comparing with their service experiences and expectations. The outcome, therefore, affects brand loyalty and purchase decision whether to stay or switch (Lovelock, Wirtz & Keh, 2002).

2.1.3 Switching Behavior in Service Industry

Switching Behavior

Switching behavior is the customer's purchase decision whether to stay with the current service provider or to switch to the other service providers due to the perceived quality, (dis)satisfaction, responsiveness to service failures, switching costs, involvement and loyalty (Zeithaml & Bitner, 2003). Switchers are the customers who have terminated using the services from their current service providers and switched to the other service providers (Keaveney, 1995). On the other hand, continuers refer to the customers who have experience with only one service provider (Ganesh, Arnold and Reynolds, 2000). According to the study of customer switching behavior in service industries done by Keaveney (1995), it was found that the customers switch their service providers due mainly to the following reasons: pricing, inconvenience, core service failures, service encounter failures, responsiveness to failed service encounters, competition and ethical problems. In addition, the other factors which affect the customers' decisions whether to remain loyal to the current service providers or switch brands include the customers' prior experience, product knowledge, satisfaction, media search, consideration-set-formation and retailer search (Sambandam & Lord, 1995). Some researchers mentioned that the customers' attitude such as perceived risk will strongly influence service switching (Zeithaml & Bitner, 2003).

Normally, loyal customers promote business opportunities by purchasing more, paying premium price, making positive word-of-mouth. This encourages

the providers to implement retention and loyalty programs. However, in reality, it is recognized that not all efforts should be focused on retention and loyalty as some loyal customers may switch for other reasons such as job related relocation. According to the brand-switching literature, it is stated that the factors such as coupons, price are correlated to the lower satisfaction and repeat purchase intention on the switched-to brand (Ganesh, Arnold & Reynolds, 2000). Customer retention is, therefore, one of the most important strategies of the company when the cost of attracting new customers may be five times higher than the cost of maintaining the existing ones. In doing so, there are two ways to accomplish it: raising high switching barriers and providing high customer satisfaction (Fornell, 1992). According to Kotler (1994), the company's goal is not only to increase the number of customers but also to retain its customer base. Prior research reported that retaining existing customer costs less than finding new ones (East, 1997).

Switching costs are, thus, conceptualized as the perception of degree of the additional costs required to terminate a relationship and find out an alternative one (Patterson & Ross, 2003). When consumers consider switching service providers, they may perceive the obstacles including searching cost, transaction cost, learning cost, loyal customer discounts, customer habit, emotional cost and cognitive effort together with all financial, social and psychological risks (Fornell, 1992). As a result, some dissatisfied customers seem to have loyalty with their current service providers only because of high switching costs. For the mobile phone market, various types of switching costs including transaction costs (time

and effort, etc.), search costs (cost of time for seeking information on prices, benefits, etc.) are exposed (Lee, Lee & Feick, 2001).

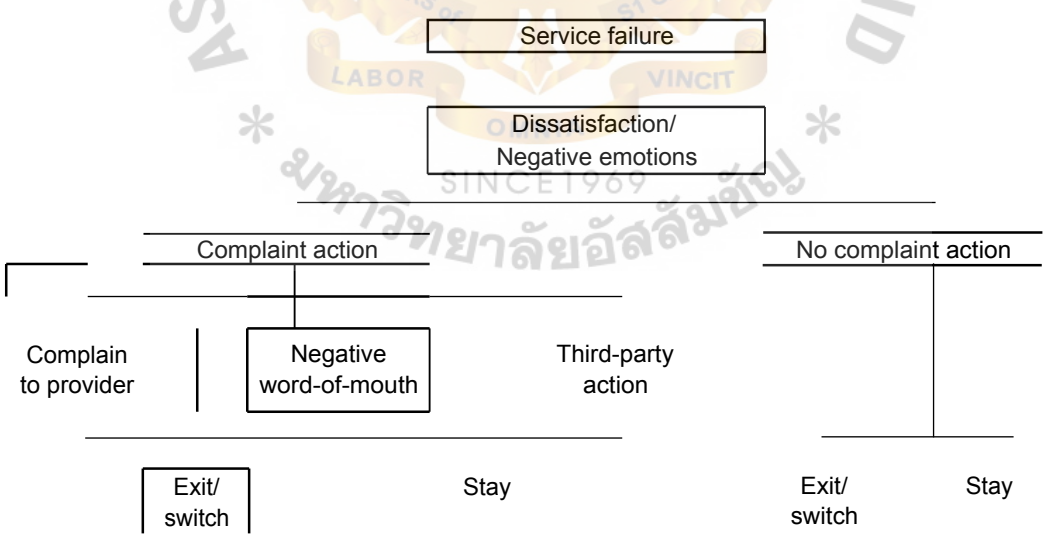
Subscription or membership-based service firms such as telecommunication companies, whose revenues are based on fixed fees for basic services with additional charges for increased usage, can be affected by customer switching behavior when fixed costs such as investment in advanced technology is allocated across a large number of customers in terms of monthly fees (Keaveney & Parthasarathy, 2001). The understanding of switching behavior helps companies to implement effective and appropriate marketing strategies including switching barriers. The companies having low barriers and weak customer satisfaction need to compete on price in the forms of sales promotions, etc., which finally result in a negative effect on gross margins (Fornell, 1992).

Consequence of Service Switching and How Customer Response to Service Failure

Whenever customers switch service providers, it is likely they will participate in post-switching behaviors associated with such incidents, mainly through word-of-mouth communications (Keaveney, 1995). The inability to deliver or late delivery of services, incorrect or poor execution, uncaring or rude employees are all the examples of service failures that bring about negative feelings and responses from customers such as anger, discontent, disappointment, and anxiety (Zeithaml & Bitner, 2003).

In response to consumption experience, the customers can take one or more of four behavioral responses, which are exit, voice, continued patronage or staying and twist or resistance. Exit, which refers to not purchasing or using the service again, is one of the alternative behavioral responses to dissatisfied experience. Voice can take different forms including compliments in response to satisfied outcome, complaints about performance failure, negative or positive word-of-mouth with other consumers or third-party complaints or compliments. Continued patronage or staying happens to customers who have high loyalty and are willing to re-purchase a preferred service in the future even though they are induced by the incentives to switch. Twist refers to negative or positive reactions to satisfaction or dissatisfaction with novel unanticipated behaviors (Arnould, Price & Zinkhan, 2004).

Figure 2.2: Customer Complaint Actions Following Service Failure



Source: Zeithaml & Bitner (2003). Service Marketing Integrating Customer Focus Across the Firm (3rd ed.). New York: McGraw-Hill, pp. 190.

As shown in Figure 2.2 above, there are three possible ways for dissatisfied customers to make a complaint, either (1) to service providers or (2) to spread negative word-of-mouth to friends, relatives and coworkers or (3) to complain to third parties such as government agencies. Finally, it ends up with two alternatives: whether to patronize the current service providers or to switch to other service providers. On the other hand, the customers may decide not to complain because of a possibility wasting time and effort, not knowing how to complain, or emotion (Zeithaml & Bitner, 2003). In some events, when customers are dissatisfied, they may remain with their current service providers due to high switching barriers, but engage in negative word-of-mouth (Jones, Mothersbaugh & Betty 2000).

Some researchers also suggest that perceived quality failure leads to two types of responses including exit and voice. Exit is switching to other products or suppliers whereas voice or complaining can be in a number of forms such as negative word-of-mouth, redress-seeking from suppliers and occasionally formal complaints through legal means. On the other hand, satisfaction leads to loyalty and positive word-of-mouth (East, 1997). Complaining relieves the conflict that happened from dissatisfaction as well as makes the customer less dissatisfied in the future. Appropriate responses to complaints help the company to prevent switching (Nyer, 2000). The findings of research done by Nyer (2000) showed that encouraging dissatisfied consumers to express their feelings and opinions causes an increase in the level of satisfaction and product evaluation. In addition, complaining also influences actual purchasing behavior.

2.1.4 Information Search

Consumer behavior, which relates to action of individuals or groups to acquire, use and dispose of products, services, ideas or experiences, normally involves the process of searching information and actual product purchase (Arnould, Price & Zinkhan, 2004). Consumer information search shows that different types of information sources vary between goods versus services decisions, which definitely affect predictive expectations, satisfaction and switching behavior (Keaveney & Parthasarathy, 2001). Past research in consumer information search behavior has indicated that consumer motivation and knowledge are influential in their further search activities (Jee & Lee, 2002). Before making a purchase decision or switching the service providers, information search is generally employed by the consumers in order to reduce perceived risks of uncertainty over purchase, which happen from a lack of knowledge and information. It is also found that greater perceived risk involving purchase or switching decisions leads to more participation in product-related conversations and word-of-mouth discussions (Murray, 1991). Besides, the consumers engage in information search when they feel that the amount and quality of information available are insufficient or in conflict with the past experiences (Assael, 1981).

Sources of Information

Information search, thus, involves the consumer buying process when the consumers are looking for reading materials, talking with friends or visiting stores to learn about products or services (Kotler, 2000). In fact, internal information in

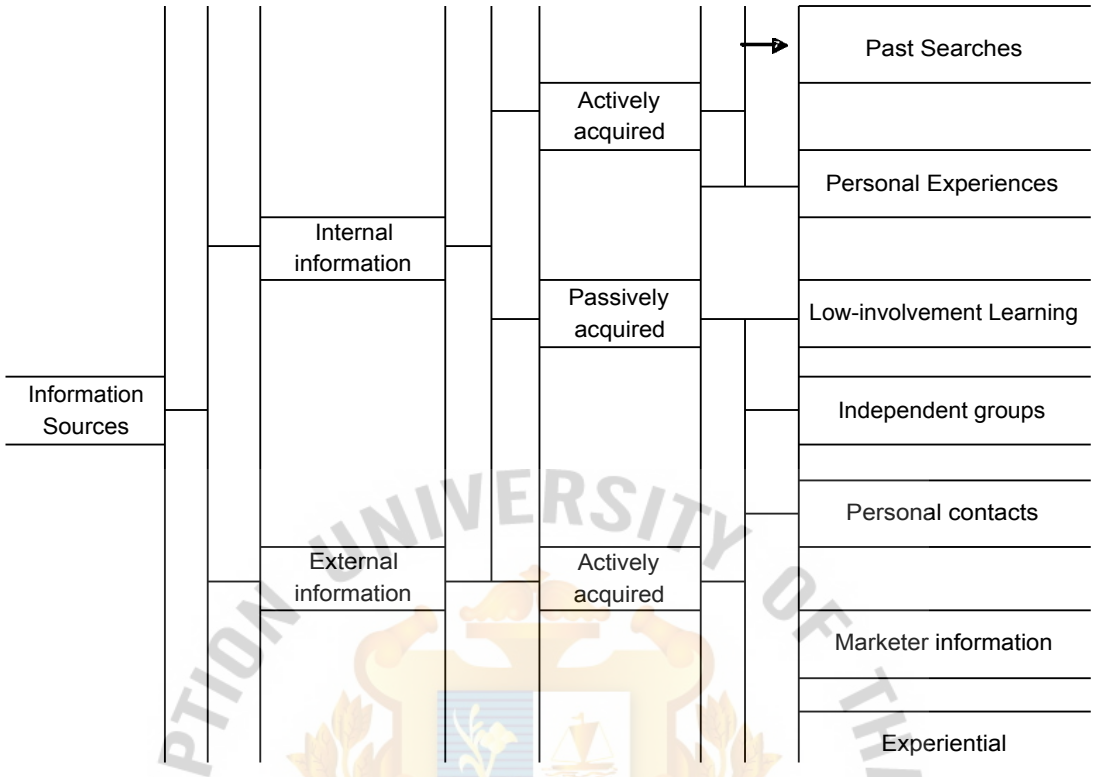
the long-term memory is originally obtained from external sources, and then transformed and stored as a memory. Apart from this, the consumers also acquire the information from external sources such as word-of-mouth communications with friends, media, brochures (Hawkins, Best & Coney, 2004). The credibility of the information sources is based on the consumers' perceived intentions (Schiffman & Kanuk, 2000).

Generally, there are five primary sources of information which are as follows:

1. Personal sources such as family, friends, neighbors.
2. Commercial sources or marketer-dominated sources presenting an informing function such as advertising, salespersons, dealers, displays.
3. Public sources or independent sources performing evaluation function such as mass media, consumer-rating, government agencies.
4. Experiential sources: inspection or product trial (Kotler, 2000).
5. Memory of past searches, personal experiences and low-involvement learning (Hawkins, Best & Coney, 2004).

Based on the primary sources above, information sources linked to purchase decision can be divided into two groups: internal and external information. The subsets of each information source used for purchase decision are also shown in Figure 2.3.

Figure 2.3: Information Sources for a Purchase Decision



Source: Hawkins, Best & Coney (2004). Consumer Behavior; Building Marketing Strategy (9th ed.). New York, McGraw-Hill, pp. 531

Figure 2.3 identifies that information sources are divided into internal and external information. Internal information is acquired in two ways: actively acquired information through past searches and personal experiences and passively acquired information through low-involvement learning. For external information, information is actively obtained from word-of-mouth communication (independent groups and personal contacts), marketer-dominated sources and experiential sources.

Furthermore, the concept of consumer information sources in the study switching behavior done by Keaveney & Parthasarathy (2001) identifies that information sources are obtained from three sources: external sources of information, interpersonal sources of information and experiential sources of information. Each source of information can be elaborated as follows:

1. External sources of information

Consumers use external information search by reading about products or services in mass media, using marketer-dominated print information and researching third-party reviews of products and services in articles, books, magazines, brochures, pamphlets, advertisement, reviews and ratings (Keaveney & Parthasarathy, 2001). This is also called impersonal information which is divided into two sub-categories, which are impersonal advocate referring to print media and broadcast advertising and impersonal independent referring to information gathered from popular articles and broadcast programming (Mitra, Reiss & Capella, 1999). Normally, consumers prefer external and impersonal sources more when choosing goods, but less when choosing services. Consumers who use the information sources are interested in the real and material information about the service attributes that the predictive expectations of the service performance are more accurate (Keaveney & Parthasarathy, 2001).

In fact, customers generally participate in extensive external search before purchasing. However, it is clear that information acquisition is not free when costs of search include monetary costs such as transportation cost, parking, internet time

charged and non-monetary costs such as time, energy, psychological effect (Hawkins, Best & Coney, 2004).

2. Interpersonal sources of information

Interpersonal influence is defined as thinking or purchase behavior influenced by other people's intentional or unintentional, expressive and goal-directed communications (Arnould, Price & Zinkhan, 2004). Some customers, who have little prior experience or low confidence in their own judgment, rely on word-of-mouth opinions from other persons rather than their own decision-making processes when making product or service decisions (Keaveney & Parthasarathy, 2001). These sources of information are considered customer-dominated sources that the marketer has little control over (Mitra, Reiss & Capella, 1999). However, negative disconfirmation might happen if the services do not perform in the way that the friends or other persons have described. This strongly results in switching services or discontinuing uses (Keaveney & Parthasarathy, 2001).

The findings of several studies indicate that word-of-mouth (WOM) is particularly useful and important as a source of risk-reducing information for consumers rather than external or impersonal communication owing to clarification and feedback opportunities (Murray, 1991). There are two characteristics of information searchers influencing the responsiveness to information search, which are: (1) the preference that information searchers have

for word-of-mouth as an information source and (2) information searchers' own expertise. Expertise is the knowledge that a source possesses (Gilly et al., 1998).

In services businesses, customers normally have active contact with service providers through visits to the facilities and face-to-face interactions with employees. Nowadays, the customers, if faced with any problems, will make a contact with the service providers through e-mail messages, telephone communication while never visiting the offices. Thus, service encounter is not only one of the major factors affecting the customers' experience with the service providers but also central to creating satisfied customers (Lovelock, Wirtz & Keh, 2002)

3. Experiential source of information

The higher perceived risk associated with the purchase or service decision-making, the more consumers prefer to participate in their observation and experience. Information gathered from experience has more influence on the behavior than other sources of information. To such extent, the consumers have not only personal knowledge about service attributes in their memory but also personal experiences whether or not the services fit their needs. Not surprisingly, the predictive expectations based on experience are quite accurate and the disconfirmation level tends to be low (Keaveney & Parthasarathy, 2001).

In fact, consumers should recognize that the information search, which engages in mental and physical activities that the consumers must act, takes time,

energy and money (Hawkins, Best & Coney, 2004). To such extent, switching to another service provider requires time, effort and monetary costs of evaluating information and costs of learning about the new service routines and rules before making the decision of switching or staying (Assael, 1981).

Thailand's mobile phone market is competitive and now entering the saturation stage. The mobile phone market essentially shows the various elements of switching costs including transaction costs (the cost of time and effort in filling out the forms, etc.), and search costs (the costs of time in seeking information on prices, benefits, service, etc. from the various providers) (Lee, Lee & Feick, 2001).

2.1.5 Involvement

Involvement, which shows the psychological outcome of motivation, is regarded as the perceived level of personal value or interest induced by a stimulus in a specific situation. Involvement happens when people's needs, values or self-concept are actively developed within a given situation. High financial and social risks result in an increase in the level of consumption involvement (Arnould, Price & Zinkhan, 2004). Involvement can be defined as a function of interaction between the individual, the stimulus and the situation (Hawkins, Best & Coney, 2004). Besides, involvement is also defined as a person's perceived level relevant to the object of consideration based on inherent needs, values and interests without reference to a specific position (www.siue.edu. visited on October 21, 2004). However, individual consumers perceive the same products or services

differently and consequently have different levels of consumer involvement, either high or low involvement (Arnould, Price & Zinkhan, 2004). This reflects the consumers' subjective feelings regarding the importance of judgment process (Jee & Lee, 2002).

Involvement theory states that people participate in limited information processing in the case of low significance, low risks, brand familiarity. On the contrary, people engage in active information processing in the case of high importance, high value, high risk (Glowa, 2001).

Level of Consumer Involvement

Level of involvement can be divided into two categories which are high-involvement purchase and consumption and low-involvement purchase and consumption based on the degree of personal relevance that the products hold for that consumer (Assael, 1981). The hierarchy of effects from low involvement consumption is definitely different from the high involvement case, which can be summarized into four types of behaviors as shown in Figure 2.4.

Figure 2.4: A Classification of Four Types of Consumer Behavior

	High Involvement	Low Involvement
Significant differences between brands	**Model** - Beliefs - Evaluation - Behavior	**Model** - Beliefs - Evaluation - Behavior
	Theory - Cognitive Learning	**Theory** - Low Involvement Decision Making
	Decision Process - Complex Decision Making or Brand Loyalty	**Decision Process** - Variety Seeking through random choice or experimentation
Few differences between brands	**Model** - Behavior - Beliefs - Evaluation	**Model** - Beliefs - Behavior
	Theory - Dissonance or Attribution Theory	**Theory** - Low Involvement Decision Making
	Decision Process - Dissonance Reduction or Attribution	**Decision Process** - Inertia

Source: Assael (1981). Consumer Behavior and Marketing Action (1st ed.). Massachusetts, Kent, pp. 80

1. High-Involvement purchase and consumption

High involvement purchase is relevant to the purchases that are very important to the consumer in tetras of perceived risks and extensive problem solving through information processing (Schiffman & Kanuk, 2000). Consumers with high involvement actively participate in information search, especially

through newspapers or advertising. When high-involvement consumers spend time and effort to search information, they generally show higher satisfaction and less negative disconfirmation with the service they consume. High-involvement consumers evaluate alternatives and make comparison before making the decision. They are thus brand loyal, but use their experiences as criteria for future purchase decisions (Arnould, Price & Zinkhan, 2004).

Cognitive learning theory is employed for high involvement with significant differences between brands (Assael, 1981). It is defined as mental information processing, often in response to problem solving. Normally, individual has different cognitive manner about the products such as imagery, familiarity and previous experiences. Thus, consumers with high cognitive ability seemingly acquire additional information and process such information more than low cognitive consumers (Schiffman & Kanuk, 2000).

For high involvement with few differences between brands, dissonance or attribution theory is applied to describe this type of consumer behavior. Dissonance theory occurs after a purchase when the consumers have conflicting thoughts about beliefs or attitude objects. Another alternative theory for this type of consumer behavior is attribution theory. Attribution theory describes attitude formation and change as a result of people's thought based on their self-perceptions and experiences, which happens after the purchase. There are no prior beliefs or evaluation. The sequences of both dissonance and attribution theories

are similar in the order of behavior, then beliefs and then evaluation (Assael, 1981).

2. Low-Involvement purchase and consumption

Low involvement purchases happen for the purchases that are not very important to the consumers, have little relevance and perceived risk and require very limited information processing (Schiffman & Kanuk, 2000). Decision-making for low-involvement consumers comes from simple cognitive of the products or services and less impact from experiences. Thus, they are inactive information seekers and processors. Furthermore, substitution among brands and indifferent brand perceptions are indicative of low-involvement consumers (Arnould, Price & Zinkhan, 2004).

In relation to low-involvement with significant differences between brands, variety seeking occurs when the consumers try to diversify brands with little psychological involvement and low risk in switching to another brand. Inertia refers to the consumers who have been facing with low involvement and few differences between brands. The inert consumers will either randomly choose a brand or create spurious loyalty from their familiarity or avoidance of decision processing (Assael, 1981).

Characteristics of Consumer Involvement

Involvement is influenced by personal needs, goals, characteristics, situational and decision factors relating to search behavior, information processing and persuasion (Arnould, Price & Zinkhan, 2004). Following this, involvement can be grouped into 4 types as follows:

- **Cognitive involvement**

Comprehensive brand comparison along with sharp thinking and processing information about the goal involves cognitive involvement (Arnould, Price & Zinkhan, 2004). Cognitive involvement also concerns measurement of ego involvement, risk perception and purchase value (Schiffman & Kanuk, 2000).

- **Affective involvement**

Affective involvement refers to comprehensive feelings and emotional energy, stimulated by advertising to encourage people to have experience (Arnould, Price & Zinkhan, 2004).

- **Enduring involvement**

Enduring (or intrinsic) involvement involves a relatively natural permanent phenomenon (Se-Hyuk, 1996). It happens when consumers show interest in offering or activity over a long period of time (Arnould, Price & Zinkhan, 2004). Intrinsic sources of personal relevance ('ISPR') are used for recognizing the levels of enduring involvement in relation to consumers' feeling and knowledge formation. ISPR can be derived from past experience and stored in a consumer's long-term memory (Martin & Marshall, 1999).

- **Situational involvement**

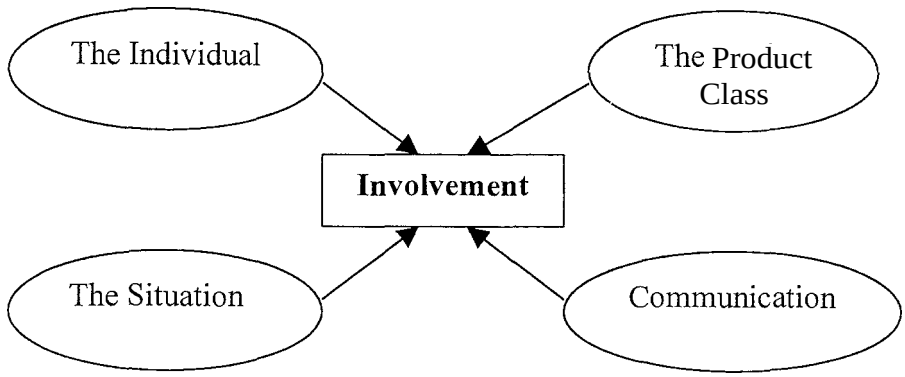
Situational involvement refers to short-term or transitory feeling of involvement and is influenced by characteristics of the decision situation such as off-season sales, advertising (Martin & Marshall, 1999; Park, 1996, Se-Hyuk, 1996). The model of situation sources of personal relevance (SSPR) is employed for recognition of level of situation involvement. SSPR are situation-specific, involve indication and stimuli of personally relevant perception of consumers (Martin & Marshall, 1999).

Ganesh, Arnold and Reynolds (2000) studied the differences between switchers and non-switchers in terms of involvement, which are categorized into two aspects: purchase involvement and ego involvement.

1. Purchase Involvement

Purchase involvement is considered as the outcome of customers' interaction with the purchase situation. It is associated with the concerned level of purchase process caused by customers' need when making the decision. It refers to the cost, effort or investment in a purchase. Customers have experienced changes in purchase involvement along with the relevant change in environment. Thus, the cognitive evaluation based on prior experience results in higher purchase involvement (Ganesh, Arnold and Reynolds, 2000). High purchase involvement leads to an extensive search under a specific situation (Jee & Lee, 2002).

Figure 2.5: Factors influencing Purchase Involvement



Source: www.siue.edu. visited on October 21, 2004

Figure 2.5 depicts the purchase involvement which is affected by the four main factors, which are the individual, the product class, the situation and communication. Perceived risk is directly associated with purchase involvement influenced by personal needs and goals, product class, specific situation and word-of-mouth communication.

2. Ego Involvement

Ego involvement, which is similar to enduring involvement, is defined as an on-going concerned level for a particular product class based on the individual's self concept, values and ego. It is relatively independent of purchase situations. It has long been acknowledged that changes in the level of ego involvement are associated with stresses and strains of customers' experience. Stayers have experienced a high degree of familiarity with and have developed a

favorable attitude toward their current service providers. Thus, stayers are likely to exhibit a higher level of ego involvement than switchers (Ganesh, Arnold and Reynolds, 2000).

Ego involvement is also defined as the state of identification happening between the individual and activity in association with the level of enjoyment and self expression toward the activity (Young, Williams & Roggenbuck, 1991). Ego involvement affects the product decision when the individual involves consciousness of one's self identity, feelings of importance, personal status and self-esteem (Schultz, 2001).

Measuring Involvement

Many different quantitative measures have been employed to assess the degree of involvement associated with products, promotions, purchases, consumption experiences. The acceptable method is a continuum rather than dichotomy while many use multi-item scales (Schiffman & Kanuk, 2000).

The revised Personal Involvement Inventory, so called RPII, measures involvement through a seven-point scale or on a semantic differential scale. There are three main advantages of RPII, which are to include in a survey or experiment when it contains only ten items, to divide into two overall factors-cognitive and affective consistent with the involvement theory, and to measure a wide variety of

stimulus objects, including products, ads or purchase decision (Arnould, Price & Zinkhan, 2004).

2.1.6 Loyalty

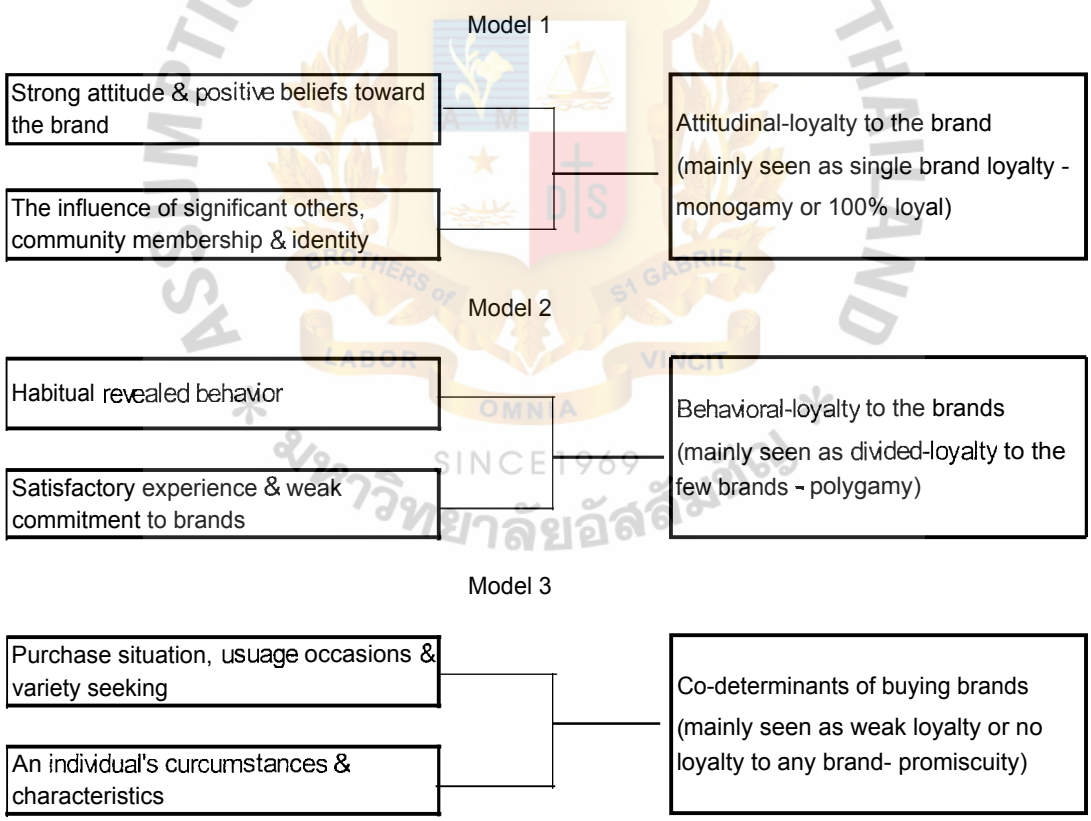
Nature of loyalty includes customer loyalty and brand loyalty. Actually, the terms brand loyalty and service loyalty are defined in the same way. Generally, loyalty measures can be categorized as either behavioral or attitudinal (Thiele & Mackay, 2001). Loyalty, in general, is measured by repurchase intention and price tolerance (Fornell, 1992). Besides, loyalty is also defined as repeated purchase of specific products or services during a certain period of time (Yi & Jeon, 2003). Loyalty is created by using financial, social and structural bonding processes (Jenkinson, 1996). Thus, the degree of commitment to particular brands depends on switching costs, the availability of substitutes, perceived risks and satisfied experiences in the past (Zeithelm & Bitner, 2003)

Customer loyalty is defined as the relationship between an individual attitude in the direction of an entity (i.e. brand, service) and patronage behavior (Schiffman & Kanuk, 2000). Besides, customer loyalty also refers to the future commitment to re-patronize the preferred products or services even though there are some situations and marketing efforts such as promotion potentially causing switching behavior (Arnould, Price & Zinkhan, 2004). Customer loyalty is also the feeling of affection for product or services, which leads the customers to many forms of customer behavior (Jones & Sasser, 1995). Consequently, customer

retention can be achieved in two basic ways, which include building up true attitudinal and behavioral loyalty and putting up switching barriers such as cost of switching to another service provider (Patterson & Smith, 2003). Bitner (1990) mentioned that service loyalty might be affected by the factors including time and money, lack of alternatives, switching costs and habit.

Uncles, Dowling and Hammond (2002) summarized that there are three popular conceptualizations, which are described and depicted in Figure 2.5 below.

Figure 2.6: Conceptualization of Customer Loyalty



Source: Uncles, Dowling & Hammond (2002). Customer Loyalty and Customer Loyalty Programs, Journal of Consumer Marketing. www.marketing.unsw.edu.au.

Model 1: Loyalty is primarily referred to attitude leading to a relationship with the brand.

The measure of these attitudes can take place by interviewing the customers how much they like the brand, feel committed to the brand whether they will recommend it to others, and have positive beliefs and feelings about it compared to competing brands. The key success factors are to predict brand's purchase and to determine repeat patronage. The attitudinal perspective is relevant to the objective of this research.

Model 2: Loyalty is mainly defined in terms of exposed behavior.

From this point of view, loyalty is defined as a continuing tendency to buy the selected brand, out of several brands. The reason is that the consumers repeat purchasing the same brand, not because of any strong prior attitude or deep commitment, but because it is not worth the time and trouble searching for an alternative. In addition, the consumers may consider that it is not worth making their effort to decide on alternative brands when all are likely satisfactory.

Model 3: Buying is influenced by the individual's characteristics, circumstances and/or the purchase situation.

Individual's characteristics include the desire for variety, habit, the need to conform, the tolerance for risk, etc. Individual circumstances include budget effects and time pressure. Examples of purchase situation are product availability, promotion, specific use. These factors, thus, co-determine the status of loyalty.

Besides this, loyalty can be divided into four categories including loyalty, spurious loyalty, latent loyalty and no loyalty as shown in Figure 2.6 below.

Figure 2.7: Brand Loyalty as a Function of Relative Attitude and Patronage Behavior

Relative Attitude	Repeat Patronage	
	High	Low
High	Loyalty	Latent Loyalty
Low	Spurious Loyalty	No Loyalty

Source: Schiffman & Kanuk (2000) .Consumer Behavior (7th ed.)._ New Jersey: Prentice Hall, pp.192 (From: Dick Alan S. and Basu, Kunal (1994). Customer Loyalty: Toward an Integrated Conceptual Framework. Journal of the Academy of Marketing Science. Vol. 22, pp. 99-113

According to figure 2.6, brand loyalty refers to the customers who have high relative attitude and high degree of repeat patronage. Some theories mentioned that this is the relationship between brand loyalty and high involvement. Following this, high involvement leads to active, extensive information search whereas spurious loyalty exists in the group of customers who have low relative attitude with little differentiation among brands in low-involvement aspects, but engage in high repeat patronage (Schiffman & Kanuk, 2000). The degree to which a customer's evaluation of one product or brand

dominates that of other alternatives is called relative attitude (Olsen, 2002). Spurious loyalty also refers to repeat purchasing of a brand without commitment, but relates to habitual purchasing with a low level of involvement (Assael, 1981).

Measures of Loyalty

Customer loyalty has been operationalized as behavior and attitude (Lee, Lee & Feick, 2001). Apart from these two measures, the additional measure is differentiation loyalty (Thiele & Mackay, 2001).

1. Behavioral loyalty

Behavioral loyalty is measured by actual purchases observed over a period of time or as a low differential needed for switching. The examples of behavioral loyalty's aspects are hard-core loyalty and repeat purchase probability (Lee, Lee & Feick, 2001).

2. Attitudinal loyalty

Attitudinal loyalty is measured in terms of stated preferences, commitment or purchase intentions. It is found that some behaviorally-loyal customers show attitudinal disloyalty as intention to switch in the future is observed. The measures of attitudinal loyalty are attitude toward the act, brand, verbal probability and preference (Lee, Lee & Feick, 2001). In another sense, attitudinal loyalty, which relates to the degree of psychological attachment exposed by each consumer, includes cognitive, affective and conative elements (Yi & Jeon, 2003). This also relates to Model 1 in Figure 2.5.

3. Differentiation loyalty

Differentiation loyalty is determined when a firm or brand protects buyers from competing brands (Thiele & Mackay, 2001).

According to the research done by Ganesh, Arnold & Reynolds (2000), the two-factor solution of the customer loyalty measures, active loyalty and passive loyalty, was employed.

1. **Active loyalty,** which is similar to the concept of affective loyalty, is defined as customer behavior besides repeat patronage, such as word-of-mouth and expansion of service usage (Ganesh, Arnold & Reynolds, 2000). It is driven by a static and current assessment of the service providers (Wangenheim & Bayon, 2001). In terms of affective loyalty, it can be defined as a psychological concept caused by the individual's need to continue a particular program (Se-Hyuk, 1996). In reality of the business world, customer referral and word-of-mouth are significantly important aspects in acquiring new customers (Jones & Sasser, 1995).

2. **Passive loyalty,** which is similar to conative loyalty, refers to consumer behaviors related to the customers' willingness of repeat patronage with the current service provider and defenselessness to competitive actions (Ganesh, Arnold & Reynolds, 2000). In fact, intent to repurchase can be measured at any time mainly through asking the customers (Jones & Sasser, 1995). Passive loyalty is driven by switching costs and the effect of changes in marketing variables

(Wangenheim & Bayon, 2001). Conative component is generally expressed in the form of consumer's intention to buy (Schiffman & Kanuk, 2000).

The measure of loyalty in terms of active and passive loyalty conforms to the research done by Lee, Lee & Feick (2001) when the active loyalty is measured by the willingness to recommend the current service provider to friends and associates while the passive loyalty is measured by repurchase intent and resistance to switching to competitors' services in view of better offers.

2.2 Previous studies related to the research

Keaveney & Parthasarathy (2001) used an online service in their exploratory study of switching behavior and found that the roles of selected attitudinal, behavioral, and demographic factors were effective in discriminating between switchers and continuers. Independent variables included information influence (external, interpersonal and experiential influences) that customers used for decision-making, service usage (frequency, intensity and overall), attitudinal of risk-taking propensity and demographic (income and education). Extension of the study included measures of satisfaction and involvement. The sample size was estimated by using power analysis and recommended procedures for discriminant function analysis. Questionnaire was sent to 443 respondents who had agreed to participate in the study. The study found that continuers had more prior experience than switchers with the service after purchasing in the form of increased usage. It meant that there was a relationship between service usage and continuance. In relation to information influence, the research found that lower use of external, impersonal sources of information when making decision for online service was associated with higher service switching. On the other hand, reduced reliance on the experiential sources was related to increased service switching behavior. Finally, the decision-making of subscription for online service switcher was influenced by word-of-mouth rather than through research or previous experiences.

Ganesh, Arnold & Reynolds (2000) studied whether the three groups of a bank's customers (dissatisfied switchers, satisfied switchers and stayers) differed in their overall satisfaction, satisfaction with the individual aspects of the banking service (people factors, location convenience, ease of transaction and cost), purchase and ego involvement, active and passive loyalty and demographic characteristics (sex, marital status, age, household income and education). Sampling units were selected from the telephone directory in proportion to alphabetical listings. Data was collected through telephone interview by using script. Of total 828 calls, there were 200 usable responses whereas the rest were no answer, busy signal, refusal to answer, no contact and unusable responses because of missing values. ANOVA was the statistical technique for examining group means on the overall satisfaction while factor analysis was employed to measure involvement and loyalty. Then, discriminant analysis was used to measure the discriminants among the three groups of customers. The findings indicated that the three groups of bank's customers differed significantly in terms of their satisfaction with the current service provider, purchase and ego involvement processes and loyalty toward the service provider. The dissatisfied switchers were significantly found to engage in active loyalty behaviors, whereas stayers, who exhibited higher satisfaction than satisfied switchers but lower satisfaction than the dissatisfaction switchers were likely to exhibit only passive loyalty.

Edvardsson & Ross (forthcoming) used the telecommunication market in Sweden in their study of customer complaints and switching behavior. The CIT-based method (Critical Incident Technique) developed by Ross (1999) was employed to identify and describe the switching process from the customers' perspective. This method means that the customers are asked to identify specific and critical incidents, which they remember at the time of the interview. Then, the stories are written down, analyzed and sorted in different groups. The first phase studied the complaint behavior in collection of the data by interviewing with 23 customers who had ever made the complaint. Of total 209 customers, 33 customers were interviewed for the second phase, which focused on the reasons why they switched from one telecom operator to another. In the research, there were three categories of critical incidents from the first phase, which were technical problem, pricing and billing and miscellaneous regarding disconnection, transfer of phone number, information regarding hypersensitivity to electricity, installation of extra phone jack and dissatisfaction with the instruction regarding a new system. The results of findings were summarized into 3 aspects which are causes (i.e. frequency of switch, complaints about costs), course of event (i.e. was offered a quick solution to the problem, was treated well and promised connection) and results or the effects of customer's future relationship (i.e. satisfied or dissatisfied leading to strengthened or weakened relationship). For the second phase, the most critical incidents that caused the customers to switch to other service providers were found that included:

- problems with core service (e.g. technical problem)
- treatment by the service providers that causes positive or negative feelings
- information (e.g. an acceptance explanation of the problem)
- correction of the problem and how and when this takes place.

To such extent, the customers could be classified into 3 groups. The first group was situation-trigger related switching process in which the customers consider and plan to change once there are something new happening. Thus, interaction and communication between the service provider and the customers in this group is very important to avoid the switching path. Group 2 refers to influence-trigger related switching path. There were two groups of customers in this group based on the scale of less extreme (switching often without reasons) to extreme (customers who are interested in and demand competent service and support when they need them). This group of customer remains loyal as long as nothing new happens. The last one refers to reaction customer group, who were classified as loyal customers feeling secure in their relationship with the service providers. They are dependent on customer support and this is a reason why they often complain. Finally, it can be concluded that the combination of the effect of negative word-of-mouth, switching and reduced consumption will negatively affect the productivity and profitability of the customers' relationships.

Chaisompong (2001) studied consumer product involvement for mobile phones. The study investigated the influence of demographic factors (age, household income and education level) on customer product involvement (perceived product importance, perceived risk, hedonic value and symbolic value). The findings indicated that age, household income and education level were not associated with the perceived product importance and hedonic value. Age and household income factors were related with perceived risk of the product while only age factor was associated with symbolic value. Furthermore, the product importance and symbolic value were critical parts of consumer product involvement for mobile phone.

Sansinrungsri (2003) studied the influencing determinants in customer service switching for book rental business. Some causes of service switching behavior developed by Keaveney (1995) including book rental rate, location, operation hours, desired book availability, physical surrounding and service personnel were selected to examine the degree to which each factor related to the switching behavior. The 120 respondents, who were the customers of two book rental shops located around Assumption University, were interviewed through questionnaires. The results, which used discriminant analysis, indicated that there were significant relationships between those six variables and switching behavior. The most influential factor affecting switching behavior was location of shop whereas the least influential factor was operation hours. Furthermore, the findings showed that the switchers perceived predictor variables as identifiable and significantly different from the continuers' point of view.

Sritanatorn (2003) studied what factors led to mobile phone service switching among AIS, DTAC, TA Orange prepaid system users in Bangkok. Keaveney (1995)'s model of service switching behavior was used as a guideline for this research. Thus, the five factors including pricing, accessibility of the location, level of core service, level of service encounter and competition were examined for the switching behavior of mobile phone users among AIS, DTAC and TA Orange. Cluster analysis was employed as a statistical test whereas the data collection came from 384 respondents using structured questionnaires. The findings concluded that all independent factors were causes of service switching. In addition, the pricing, accessibility of the location and level of core service were related to high percentage shift between AIS', DTAC's and TA Orange's prepaid users.

Sutthipongkoon (2003) studied the relationship between functions of brand and response from Nokia mobile phone's buyers and users in Bangkok. Four brand functions in the study including guarantee, personal identification, social identification and status were employed as independent variables. Dependent variable was consumer response, which consisted of intention to purchase line extension products, recommendation and price premium. The respondents were buyers and users of Nokia mobile phones residing in Bangkok. The findings showed that guarantee, personal identification and status correlated with consumer responses. Thus, these factors influenced Nokia mobile phone users to be more willing to purchase line extension products, to recommend the brand to others and

to pay the price premium for the brand. On the other hand, there were no relationships between social identification functions and consumer response.

CHAPTER 3

RESEARCH FRAMEWORKS

This chapter includes four sections consisting of theoretical framework, conceptual framework, research hypotheses and operationalization of the independent and dependent variables.

Prior researches relate switching behavior and intentions to perception of service quality, (dis)satisfaction and service encounter failures (Ganesh, Arnold & Reynolds, 2000). Furthermore, the model of service switching behavior developed by Keaveney (1995) is generally employed as a guideline for further studying the service switching behavior in various service industries, such as, mobile phone services and book rental services. Besides, there are some previous researchers who studied the degree to which the role of information usage, service usage, risk-taking propensity, satisfaction and involvement influences switching behavior. These cover banking service industry and online service but not the mobile phone service industry.

This research, therefore, engages in the study of the influences of information search, involvement and customer loyalty on DTAC customers' switching behavior. The research framework is based on the literature reviewed in Chapter Two.

3.1 Theoretical Framework

The theoretical framework of this research is developed by using the previous studies done by Keaveney & Parthasarathy (2001) for information search and Ganesh, Arnold & Reynolds (2000) for involvement and customer loyalty.

3.1.1 Information Search

The theoretical framework relating to information sources employs Keaveney & Parthasarathy (2001)'s prior study in the switching behavior of internet users. Keaveney & Parthasarathy (2001) identified three main different sources of information including external sources, interpersonal sources and experimental sources, the details of each source can be described as follows:

- External sources :-
  - Reading from printed media
  - Advertising through TV and radio
- Interpersonal sources:-
  - Asking opinion from salesperson
  - Asking opinion from friends, relatives
  - Asking opinion from previous customers
- Experiential sources:-
  - Reliance on past experiences
  - Trial

3.1.2 Involvement

Ganesh, Arnold & Reynolds (2000) employed the two aspects of involvement – purchase involvement and ego involvement for studying the differences between switchers and non-switchers, details of which are as follows:

- **Purchase involvement:-**
  - Comparing prices and offers among various service providers
  - Comparing the service attributes among service providers
  - Discussing about the choices with other people
  - Evaluating the pros and cons of DTAC after purchasing or switching
- **Ego involvement:-**
  - Brand image plays a major role in decision-making
  - Importance of feeling right when choosing DTAC
  - Taking many factors into account before purchasing or switching

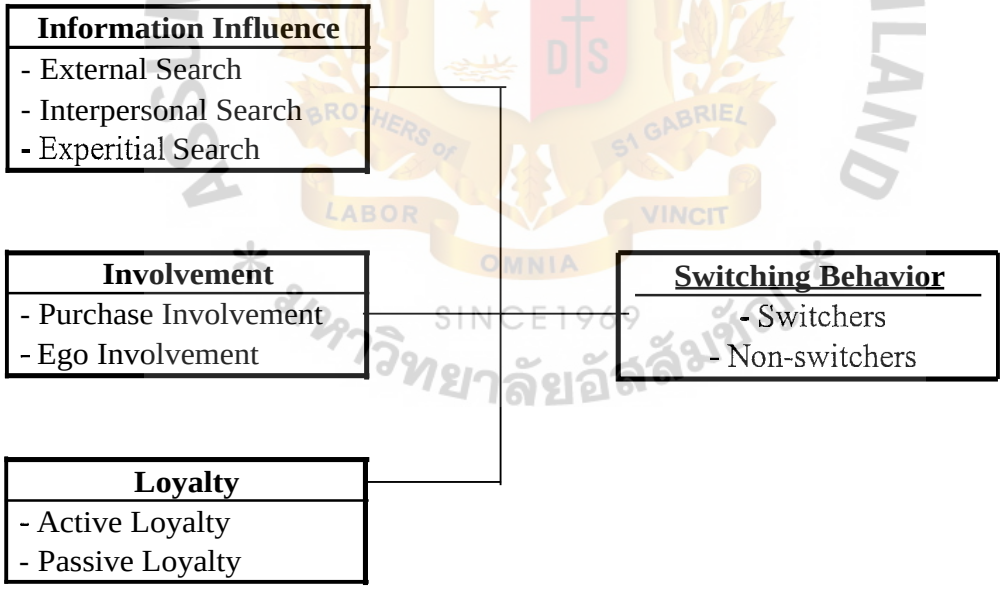
3.1.3 Customer Loyalty

Using the aforementioned loyalty literature in chapter two, this research employs the prior research done by Genesh, Arnold & Reynolds (2000). It consists of active loyalty and passive loyalty whose attributes are determined as follows:

- **Active loyalty:-**
  - Willingness to recommend preferred services to friends and associates
  - Expansion of service usage
- **Passive loyalty:-**
  - Resistance to switching to other service providers
  - Price sensitivity

3.2 Conceptual Framework

Figure 3.1: Conceptual Framework



3.3 Research Hypotheses

Unproven propositions in marketing research are specified as hypotheses, which are generally employed to define research problems in the form of statistical techniques. There are two general forms of hypotheses comprising null hypothesis and alternative hypothesis. Null hypothesis, symbolized by Ho, states that no significant differences between population groups over the measured factors are expected. If the data are accepted with no significant variance from the expectations, the null hypothesis is not rejected. The hypothesis, which is used as an alternative to the rejection of null hypothesis, is called alternative hypothesis, symbolized by Ha (Churchill, 1996; http://math.bu.edu).

In this research, the hypothesis used to test whether or not the independent variables discriminate dependent variables, which is as follows:-

H1 o: The information search, involvement and customer loyalty cannot distinguish the switching behaviors of DTAC mobile phone users.

H1a: The information search, involvement and customer loyalty can distinguish the switching behaviors of DTAC mobile phone users.

3.4 Concepts and **Operationalization** of Variables

Table 3.1: Operational component of influencing variables

Concept	Conceptual Definition	Operational Component	Level of Measurement
Information Search	- External information sources	Q4: Reading available information from printed media (such as brochures, pamphlets, point-of-sale display, others information given by service providers, third-party report, magazine, newspaper) Q5: Paying attention to advertising through TV and radio	Interval scale
	- Interpersonal Information sources	Q6: Asking opinion from sales person Q7: Asking opinion from friends, relatives Q8: Asking opinion from previous customers	
	- Experiential information sources	Q9: Rely on past experiences Q10: Try sample before purchasing / switching	

Concept	Conceptual Definition	Operational Component	Level of Measurement
Involvement	- Purchase Involvement	Q11: Comparing prices and offers among various service providers Q12: Comparing the service attributes among service providers Q13: Discussing about the choices with other people Q14: Evaluating the pros and cons of DTAC after purchasing or switching	Interval Scale
	- Ego Involvement	Q15: Brand image plays a major role in decision-making Q16: Important to feel right for choosing DTAC Q17: Taking many factors into account before purchasing or switching	
Customer Loyalty	- Active Loyalty	Q18: Definitely recommend DTAC to friends and associates Q19: Intend to use more services offered by DTAC	Interval Scale
	- Passive Loyalty	Q20: Not switch to any other service providers despite having better packages or value-added services to be offered by other service providers Q21: Remain using DTAC despite raising price	

Concept	Conceptual Definition	Operational Component	Level of Measurement
Switching Behavior	- Consumer behavior associated with termination of service usage with the previous service providers (other than DTAC) and then move to use services from DTAC.	Q1:- Switchers - Non-Switchers	Nominal Scale

CHAPTER 4

RESEARCH METHODOLOGY

The research methodology is employed to solve the research problems by using statistical tests. In this chapter, the research methodology illustrates the step by step procedures of the study, including methods of research used, respondents and sampling procedures, research instruments, data collection techniques, and statistical treatment of data.

4.1 Methods of Research Used

Research design refers to the framework or plan for a study that specifies methods and procedures for collecting and analyzing data. In addition, the sources of information, design technique, the sampling methodology, schedule and cost of research are determined (Zikmund, 2003).

In this study, primary data collected through the process of survey was deemed an appropriate technique for this study. Survey is defined as a research technique which gathers information from a sample group of people through questionnaires. Generally, surveys try to identify what is happening or to find out the reasons for a specific marketing activity. Survey is a research technique which provides a quick, inexpensive, efficient and accurate means of evaluating information as collecting information by using questionnaires is made through interviews with the respondents either by mail, over the telephone or face-to-face

(Zikmund, 2003). Some questionnaires are designed to examine customer perceptions which are constructed to evaluate different possible causes of marketing problems and to identify the appropriateness of alternative strategies.

4.2 Respondents and Sampling Procedures

4.2.1 Target Population

The target population in this study was DTAC's pre-paid and post-paid subscribers, who lived in Bangkok Metropolitan area and are over 18 years of age. Selecting this group of population was based on the reasons that they would clearly understand and have their own ideas about the products as well as make the final decision whether to stay with the current service providers or to switch to other providers.

With regard to the information available, there were 6,550,496 total subscribers as of 31 December, 2003. However, there was no sub-group of subscribers in terms of age or living areas. The researcher has, therefore, applied this figure to determine the sample size. This should provide a larger sample size than using the sub-group of subscribers and, thus, yield more accurate primary data. The method of sampling selection is detailed in the following section.

Sampling Unit

The sampling unit in this research was an individual, who was using DTAC mobile phone system, residing in Bangkok area and was over 18 years of age. Any individual who was using DTAC mobile phone system together with any other mobile phone system was excluded.

Sample Size

Even though the sampling unit in this research was specified as DTAC mobile phone users residing in Bangkok area with an age of over 18 years old, the sample size in this study was calculated from the target population of 6,550,496 subscribers because the sub-group data of subscribers in relation to age, and area of residence were not available. The sampling size of 384 was derived from the table of Anderson (Table 4.1) based on the expected rate of 95% confidence level and 5% sampling error. However, 400 respondents were set as the sample size for this study so as to minimize errors.

Table 4.1: Theoretical sample size for different sizes of population and a 95 percent level of certainty

Population (Sampling Frame)	Required Sample for Tolerable Error			
	5%	4%	3%	2%
100	79	85	91	96
500	217	272	340	413
1,000	277	375	516	705
5,000	356	535	897	1,622
10,000	381	593	1,044	2,290
100,000	382	596	1,055	2,344
1,000,000	384	599	1,065	2,344
25,000,000	384	600	1,067	2,400

Source: Anderson, G.(1996). Fundamentals of Education Research, 1996, pp.202

4.2.2 Sampling Element and Method

Sampling Procedures

Generally, there are two techniques comprising probability samples and non-probability. The choice should be based on consideration such as the nature of the research, variability in the population as well as statistical and operational considerations (Malhotra, 2004). Non-probability sampling is defined as a sampling procedure wherein the selection of population element is based in part on the researcher's judgment (Kinnear and Taylor, 1996).

Non-probability sampling is used for this research due to the fact that the telephone directory of DTAC mobile phone users is unavailable. Nevertheless, this technique, which is in the type of convenience method, saved cost of and time

for collecting data. Following this, the questionnaires were distributed in the five places selected by the researcher's own judgment based on the following criteria:

a) Shops, stores or service centers with high people traffic.

b) Locations in Bangkok area divided into five main sections. The five places selected for distributing questionnaires, all with the number of 80, included:

1) Maboonkong
2) Central World Plaza
3) Siam Square
4) Lotus Supermarket, Bangkae Branch
5) Lotus Supermarket, Nongjok Branch.

4.3 Research Instruments / Questionnaire

Self-administered questionnaires were distributed to the target population so as to obtain the primary data. The questionnaires comprised three parts relating to general information, investigation of switching behavior and record of personal data of the respondents.

Switching behavior between two groups of DTAC mobile phone users (switchers and non-switchers) discriminated by information search, involvement and customer loyalty was examined by two types of scales of measurements. The five point Likert-scale items was applied for interval scale when examining information search, involvement and customer loyalty, while a nominal scale was used to test overall switching behavior.

The questionnaires consisted of three parts:

Part 1: The first part had three questions examining the previous switching experiences among the operators of mobile phone systems, reasons for switching and duration of using DTAC mobile phone system.

Part 2: The second part had 18 questions examining the switching behavior of DTAC mobile phone users with regard to information search, involvement and customer loyalty.

Part 3: This part had 4 questions asking about demographic profile or general data of respondents in terms of gender, age, education level and income.

4.4 Collection of Data / Gathering Procedures

Both primary and secondary data were used for this research. The primary data were obtained through the process of survey with an assistance of questionnaires. The secondary data were gathered from textbooks, internet, theses, journals, newspapers and magazines relevant to the topic of this study.

Regarding the collection of primary data through the questionnaires, the researcher distributed the questionnaires to the 400 respondents who were using DTAC mobile phone service at the specific places as mentioned in Table 4.3. The respondents were specifically DTAC's pre-paid and post-paid subscribers, who lived in Bangkok Metropolitan area and were over 18 years old. The data were collected at 6 p.m. to 8 .30 p.m on weekdays and 11.00 a.m. to 8.30 p.m. on weekends during the period of December 1-18, 2004.

4.4.1 Pre-testing

Pre-testing engages in trial run with the group of respondents so as to sort out the problems in the instructions or design of a questionnaire (Zikmund, 2003). Pre-test process was conducted in order to test the reliability of the questionnaires. The 30 questionnaires for this study were distributed to the respondents as pilot testing but only 20 questionnaires were employed for reliability testing in this research while the rest were unusable due to missing value, the respondents not paying enough attention to answering the questionnaires as they were busy shopping under sales promotion at Central Department Store – Chidlom Branch. Based on the usable questionnaires, errors or better structure were collected and adjusted so the communication between researcher and respondents was clearly understood and unbiased.

Reliability is the extent to which a degree of measures is free from random errors and therefore, produces consistent results. Low degree of reliability may be derived from many factors such as misunderstanding about questions (Zikmund, 2003). In addition, the reliability is the ratio of the true score to the observed score variance. For this research, Cronbach's alpha, which is the most commonly used for testing reliability coefficient, was employed to measure internal consistency of items (www.nyu.edu, visited on 5 November, 2004). Alpha ranges in value from 0 to 1 (Coakes & Steed, 2003). If the alpha is greater than or equal to 0.6, it indicates a reliable measure of reliability (Sekaran, 1992). For this research, the alphas for information search, involvement and customer loyalty, as

per details in Appendix 3, were 0.6867, 0.8351 and 0.8375, respectively. It, therefore, can be concluded that the reliability of measure was strong.

4.5 Statistical Treatment of Data

The primary data gathered from questionnaires were analyzed by using the Statistical Package for Social Sciences ("SPSS') program for both descriptive and inferential analyses. Descriptive analysis refers to the conversion of raw data by rearranging, ordering and manipulating them into a form of descriptive information that makes them easy to understand. The most common ways to summarize data are averages, frequency distributions and percentage distributions (Zikmund, 2003). For this research, the data were tabulated in the form of frequency distribution when one variable was measured at a time. The table of frequency distribution shows frequency counts, percentages and cumulative percentages for all the values associated with that variable. Cross-tabulation is used to examine how one variable links with other variables in a single table (Malhotra, 2004). As for inferential analysis, hypothesis testing was conducted to examine whether or not DTAC mobile phone users' switching behavior was discriminated by information search, involvement and customer loyalty by using the discriminant analysis technique.

4.5.1 Discriminant Analysis

The discriminant analysis generates a weighted linear combination of the three independent variables on which the two groups differ as much as possible

(Wuensch, 2004). The basic idea of underlying discriminant function analysis is to determine whether groups differ with regard to the mean of variable, and then to use that variable to predict group membership (www.statsoft.com, visited on 29 September, 2004). Discriminant analysis has two steps: 1) an F test (Wilks'Lambda) is used to test if the discriminant model as a whole is significant, and 2) if the F test shows significance, then the individual independent variables are assessed to see which differ significantly in mean by group and these are used to classify the dependent variable (www2.chass.ncsu.edu, visited on 4 April, 2005).

Discriminant analysis is, thus, applied to test the hypotheses, in which the dependent variables are divided into two groups – switchers and non-switchers. The basic requirement of discriminant analysis is that the level of measurement for the dependent variable is nominal scale while the independent variables are interval or ratio scale (Hair et al., 1998). Key terms and concepts of discriminant analysis are described as follow:

1) Discriminating variables refer to independent variables, also called predictors.

2) The criterion variable refers to dependent variable, also called the grouping variable.

3) Discriminant function is constructed as a linear combination of discriminating variable, which is as follows:

$$D = b0 + b1X1 + b2Xx2 + \quad + bk\,xk$$

Where: D Discriminant score

bs = Discriminant coefficients or weights

Xs = Independent variables or predictors

There is one discriminant function for 2-group discriminant analysis, but for higher functions in multiple discriminant analysis, of which the number of functions is the lesser of (g-1), where g is the number of categories in the grouping variable (www2.chass.ncsu.edu, visited on 4 April, 2005).

In using discriminant analysis, the research objectives of this study were achieved by analyzing the various results tables, which are as follows:

1. Test of Equality of Group Means Table can specify which predicting factors can be used to classify the respondent into switchers and non-switchers.
2. Summary of Canonical Discriminanct Functions Table shows the result of eigenvalue, which reflects the percentage of variance explained in the dependent variable. The large eigenvalue is associated with a strong function.
3. Wilks' lambda, which is used in test of significance, is the ratio of within-groups sums of squares to the total sums of squares. The smaller the lambda for an independent variable, the more that variable contributes to the discriminant function. Lambda varies from 0 to 1, with 0 meaning group means differ and 1 meaning all group means are the same. The F test of Wilks' lambda shows which variables' contributions are significant.

$$\text{Wilks' lambda function} = \frac{\text{Within - group Sum Square}}{\text{Total Sum Square}}$$

$$\text{F Test} = \frac{\text{Between – group Mean Square}}{\text{Error Mean Square}}$$

4. The Cononical Discriminant Function Coefficients Table indicates the most important predicting factor.
5. Functions at Group Centroids are the mean values of each group of the dependent variable for each function. Two-group discriminant analysis has two centroids, of which two scores are equal in absolute value but have opposite sign (www.cs.uu.nl/docs, visited on 18 October 2004).
6. The Classification Results Table shows the quality of the model. For two-group discriminant analysis with a 50-50 split in the dependent variable, the expected percentage is 50%. For unequally split n-way groups of different sizes, the expected percent is (g1/N)*g1+(g2/N)*g2,…., (gn/N)*gn, with given g being the number of categories in the grouping variable (www2.chass.ncsu.edu, visited on 4 April, 2005).

4.6 Comparison of Research Framework and Methodology between the Empirical Research and This Research Study

Several researches have studied various aspects of the mobile phone industry and so did this research. However, the focused areas among those studies are different, hence a comparison between the empirical researches and this research on various elements of the study is shown in the table below:

Table 4.2 Comparison of research framework and methodology between the empirical researches and this research

Content	Empirical Researches			This Research
	Sritanatorn K.(2003)	**Chaisompong** N. (2001)	**Sutthipongkoon** M.(2003)	
Subject	Remark 1	Remark 2	Remark 3	Remark 4
Independents Variables	- Pricing - Accessibility to Location - Level of Core Service - Level of Service Encounter - Competition	Demographic Factors - Age - Household income - Education Level	- Guarantee - Personal Identification - Social Identification -Status	- Information Search (External, Interpersonal and Experiential Searches) - Involvement (Purchase and Ego Involvement) - Loyalty (Active and Passive Loyalty)
Dependent Variables	- Switching behavior	Involvement - Perceived product importance - Perceived Risk - Hedonic Value - Symbolic Value	- Intention to purchase line extension - Recommendation - Price Premium	- Switching Behavior
Target Population	Prepaid mobile phone users of AIS, DTAC and TA Orange	Individual living in Bangkok who has likelihood to buy mobile phone	Buyers and Users of Nokia mobile phone	DTAC Mobile Phone Users
Statistical Techniques	Cluster Analysis and K-Means Method	Correlation	Structural Equation Modeling (SEM) using Linear Structural Relations (LISREL) for confirmatory factor analysis	Discriminant Analysis

Remark 1: A Study of Factors Leading to Mobile Phone Service Switching amongst – AIS, DTAC, TA Orange Prepaid Systems Users in Bangkok

Remark 2: A Study of Consumer Product Involvement For Mobile Phone

Remark 3: A Study of the Relationship between Functions of Brand and Response of Nokia Mobile Phones' Buyers and Users in Bangkok

Remark 4: Influence of information search, involvement and loyalty on switching behavior: A Case Study of DTAC Mobile Phone Users in Bangkok Area

CHAPTER 5

DATA ANALYSIS

This chapter is divided into two sections as follows: Section one is the descriptive statistics in relation to respondents' characteristics. Section two relates to hypotheses testing between independent and dependent variables.

5.1 Descriptive Statistics Analysis

Descriptive statistics refer to the methods involving the collection, presentation, and characteristics of a set of data so as to describe the features of that set of data (www.city.timmins.on.ca, visited on 23 July, 2004). For this study, descriptive statistics were analyzed as general information about the respondents, unrelated to the objectives of this study. The analysis included two parts as follows:

5.1.1 General Information of DTAC Mobile Phone Users

- Switching Experience
- Reasons of Switching
- Usage Period of DTAC Mobile Phone System

5.1.2 Respondent Characteristics

- Gender
- Age
- Education Level
- Income Per Month

However, this section is to demonstrate the respondents' characteristics not related to the objectives of this study.

5.1.1 General Information of DTAC Mobile Phone Users

Table 5.1: Switching Experience

Switching Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Switcher	216	54.0	54.0	54.0
	Non-switcher	184	46.0	46.0	100.0
	Total	400	100.0	100.0	

Table 5.1 shows the respondents, who are using DTAC mobile phone users. They are divided into two groups – switchers and non-switchers. Of the total 400 respondents, there are 216 switchers, accounting for 54% of the respondents while the rest are non-switchers or DTAC mobile phone users who have never used other mobile phone systems other than DTAC.

Table 5.2: Reasons for switching from other mobile phones systems to **DTAC**

Reasons of Switching

	No		Yes		Total	
	Count	%	Count	%	Count	%
Dissatisfaction with pricing	56	25.9%	160	74.1%	216	100.0%
Dissatisfaction with service quality	180	83.3%	36	16.7%	216	100.0%
Dissatisfaction with signal quality	125	57.9%	91	42.1%	216	100.0%
Dissatisfaction with network coverage	191	88.4%	25	11.6%	216	100.0%
Dissatisfaction with location of service center	204	94.4%	12	5.6%	216	100.0%
Dissatisfaction with inconvenience	197	91.2%	19	8.8%	216	100.0%
Move out from service areas	207	95.8%	9	4.2%	216	100.0%
Other reasons	194	89.8%	22	10.2%	216	100.0%

Table 5.2 shows the reasons for switching given by the 216 switchers. The 184 non-switchers, who have had no switching experience, did not answer this question while the switchers are able to give more than one reason. The major reason for switching from the other mobile phone systems to DTAC is dissatisfaction with pricing, accounting for 74.1% of total switchers, followed by dissatisfaction with signal quality (42.1% of total 216 switchers). The other reasons in terms of try-outs of the other mobile phone systems and personal need for a change of one's mobile phone number, account for 10.2% of the total switchers.

Table 5.3 Usage Period of **DTAC** Mobile Phone System

How long have you used **DTAC's** mobile phone system?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	76	19.0	19.0	19.0
	More than 1 year but less than 2 years	117	29.3	29.3	48.3
	More than 2 years but less than 3 years	91	22.8	22.8	71.0
	Longer than 3 years	116	29.0	29.0	100.0
	Total	400	100.0	100.0	

There is not much difference in the usage period of DTAC mobile phone system among the respondents as shown in Table 5.3. The 117 respondents or 29.3% of the respondents have used DTAC mobile phone system for more than 1 year but less than 2 years. Similarly, the number of respondents using DTAC mobile phone system longer than 3 years are 116, accounting for 29% of the respondents, followed by 91 respondents or 22.8% of the total respondents who have used DTAC mobile phone system for more than 2 years but less than 3 years. The last group accounting for 76 respondents or 19% of the total respondents has used DTAC mobile phone system for less than 1 year.

5.1.2: Respondent Characteristics

Table 5.4: Gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	159	39.8	39.8	39.8
	Female	241	60.3	60.3	100.0
	Total	400	100.0	100.0	

Table 5.3 shows the gender of the total 400 respondents in frequency table. Males constitute 39.8% of the total respondents. The rest (241 or 60.3%) are female.

Table 5.5: Age

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-27 years old	184	46.0	46.0	46.0
	28-38 years old	156	39.0	39.0	85.0
	39-47 years old	39	9.8	9.8	94.8
	More than 47 years olds	21	5.3	5.3	100.0
	Total	400	100.0	100.0	

The largest group of the respondents as shown in Table 5.4 is aged between 18-27 years old, accounting for 46% or 184 respondents. The second largest group with 39% or 156 respondents, is aged between 28-38 years old. The 9.8% or 39 of the total respondents are between 39-47 years old. The smallest group at 5.3% or 21 of the total respondents is over 47 years old.

Table 5.6: Education Level

Education Level

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	High School graduate or less	60	15.0	15.0	15.0
	Diploma / Certificates	136	34.0	34.0	49.0
	Bachelor Degree	187	46.8	46.8	95.8
	Master Degree or higher	17	4.3	4.3	100.0
	Total	400	100.0	100.0	

Table 5.5 shows the education level of the respondents. The largest group of the respondents having a bachelor's degree accounts for 46.8% or 187 of the total respondents. The second largest group at 34% or 136 respondents has diplomas or certificates. The 60 respondents or 15% of the total respondents have a high school diploma or lower.

Table 5.7: Income Per Month

Income per month

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 10,000 baht	126	31.5	31.5	31.5
	10,001 - 20,000 baht	199	49.8	49.8	81.3
	20,001 - 30,000 baht	60	15.0	15.0	96.3
	More than 30,001 baht	15	3.8	3.8	100.0
	Total	400	100.0	100.0	

As shown in Table 5.6, the 199 respondents (49.8% of the total respondents) are the largest group having income in the range of baht 10,001 – 20,000 per month. The second largest group of the respondents has income of less than baht 10,000 per month. A total of 60 respondents or 15% of the total has income of between baht 20,001 – 30,000 per month. The last group accounting for 15 respondents or 3.8% of the total has income higher than baht 30,001 per month.

5.2 Hypotheses Testing

Inferential statistics are about the methods relating to the estimation of a characteristic or decision-making of a population based on sample results (www.city.timmins.on.ca, visited on 23 July, 2004). For this study, the hypotheses were established to test the relationship between three main independent variables (information search, involvement and customer loyalty) and a dependent variable (DTAC mobile phone users' switching behavior). The statistical technique employed was discriminant analysis, which was an appropriate form for assessing strength of relationship and classifying the two groups of DTAC mobile phone users (switchers and non-switchers). The significance level (a) was at 0.05 or 95% confidence [(1-a) * 100%]. As a result, the null hypothesis (Ho) was accepted when the significance level was higher than 0.05. On the contrary, it was rejected when the significance level was lower than 0.05.

Table 5.8: Tests of Equality of Group Means

Tests of Equality of Group Means

	Wilks' Lambda	F	df1	df2	Sig.
Information Search					
External Sources	.977	9.474	1	398	.002
Interpersonal Sources	.965	14.628	1	398	.000
Experiential Sources	.728	148.371	1	398	.000
Involvement					
Purchase Involvement	1.000	.044	1	398	.833
Ego Involvement	.988	4.758	1	398	.030
Customer Loyalty					
Active Loyalty	.978	8.924	1	398	.003
Passive Loyalty	1.000	.147	1	398	.702

Table 5.8 shows the Wilks' lambda and univariate F ratio carried out for assessment of significance between each independent variable and dependent variable. The results show that external information sources, interpersonal information search and experiential information search, ego involvement and active loyalty influence discrimination in the switching behavior of DTAC mobile phone users (switchers and non-switchers) as the Sig. values of these aspects are lower than the alpha level of 0.50 (Sig. < 0.05). The rest comprising purchase involvement and passive loyalty do not distinguish the switching behavior of DTAC mobile phone users (switchers and non-switchers) as their significant values are higher than 0.50 (Sig. > 0.05)

Table 5.9: Standardized Canonical Discriminant Function Coefficients

Standardized Canonical Discriminant Function Coefficients

	Function 1
Information Search	
External Sources	-.269
Interpersonal Sources	-.351
Experiential Sources	.972
Involvement	
Purchase Involvement	.120
Ego Involvement	-.229
Customer Loyalty	
Active Loyalty	-.248
Passive Loyalty	.015

Table 5.9 shows the relative importance of these independent variables in predicting the dependent. The larger the standardized coefficient, the greater the contribution of the respective variables to the discrimination between groups. The results indicate that experiential source of information is the major important factor influencing the switching behavior of DTAC mobile phone users (switchers and non-switchers).

Table 5.10: Functions at Group Centroids

Functions at Group Centroids

Switching Behavior	Function 1
Switcher	.702
Non-switcher	-.824

Unstandardized canonical discriminant functions evaluated at group means

Functions at group centroids shown in Table 5.10 indicate the average discriminant score for the two groups of DTAC mobile phone users. Group centroid for switchers is 0.702 whereby the non-switchers have the group centroid of -0.824. This means that both groups are different.

Table 5.11: Eigenvalue

Eigenvalue

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	.582(a)	100.0	100.0	.606

a First 1 canonical discriminant functions were used in the analysis.

Table 5.11 shows the Eigenvalue and the Canonical Correlation. The Eigenvalue in this research equals 0.582, indicating that the spread of group means is not so high. The Canonical Correlation, which shows the relationship between discriminant score of the group, indicates the acceptable level at 0.606.

Table 5.12: Wilks' Lambda

Wilks' Lambda

Test of Function(s)	Wilks' Lambda	Chi-square	df	Sig.
1	.632	180.910	7	.000

Wilks' Lambda is used to test the proportion of total variance in the discriminant scores, not explained by the differences among groups. From Table 5.12, Wilks' Lambda of 0.632 has a significant value (Sig. value = 0.000) , thus, the group means appear to differ.

Table 5.13 Classification Results

Classification Results(a)

Switching Experience			Predicted Group Membership		Total
			Switcher	Non-switcher	
Original	Count	Switcher	172	44	216
		Non-switcher	46	138	184
		Switcher	79.6	20.4	100.0
		Non-switcher	25.0	75.0	100.0

a. 77.5% of original grouped cases correctly classified.

Classification results are employed to assess the accuracy of discriminant function. The classification accuracy should be at least 25% greater than of that achieved by chance (Keaveney & Parthasarathy, 2001). Table 5.14 shows that 77.5% of the original grouped cases are correctly classified. The group of switchers accounting for 79.6% are correctly classified and the 75% of non-switchers group are correctly classified. Thus, this discriminant function is considered satisfactory and can be used to classify the switching behavior of DTAC mobile phone users.

5.3 Summary of Descriptive Statistics of Independent Variables

Table 5.14: Group descriptive statistic

Dependent Variables	Means for the Independent Variables **							Sample Size
	Information Search			Involvement		Customer Loyalty		
	X1	X2	X3	X4	X5	X6	X7	
Switchers	3.8611	3.3997	3.5579	4.0660	3.7577	3.6991	2.4444	216
Non-switchers	4.0924	3.6775	2.7283	4.0761	3.8786	3.8696	2.4755	184
Total	3.9675	3.5275	3.1763	4.0706	3.8133	3.7775	2.4588	400

**

X1 = External sources of information
X2 = Interpersonal sources of information
X3 = Experiential sources of information
X4 = Purchase involvement
X5 = Ego involvement
X6 = Active loyalty
X7 = Passive loyalty

According to the results of means shown in Table 5.15, the results, deriving from the 400 observations, can be described as follows:

1. All variables of information search show the differences in means for both groups of DTAC mobile phone users.

2. For involvement, the results show the means of purchase involvement for both groups is equal whereas the mean of ego involvement for the two groups is slightly different.

3. There is a slight difference in the mean of active loyalty whereby the mean of passive loyalty for both groups is indifferent.

CHAPTER 6

SUMMARY FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

This chapter includes three sections. The first section summarizes the findings of research objectives and hypotheses testing. The second section describes the conclusions of the study associated with the discussion of important findings. The last section describes recommendations for future research.

6.1 Summary of Findings

Discriminant analysis is employed for hypothesis testing at 95% of confidence level. The objectives of this study are to study whether the two groups of DTAC mobile phone users (switchers and non-switchers) are discriminated by information search, involvement and customer loyalty and to identify which one can distinguish switchers from non-switchers. From the findings described in Chapter 5, the result shows that discriminant function is significant (Sig. value = 0.000) at Wilk Lambda of 0.632. Following this, five out of seven determinants have power to distinguish switchers from non-switchers as detailed in Table 6.1 below.

Table 6.1: Summary of Results from Hypothesis Testing

	Wilks' Lambda	Sig.	Discriminant Factor
Information Search			
External Sources	.977	.002	Yes
Interpersonal Sources	.965	.000	Yes
Experiential Sources	.728	.000	Yes
Involvement			
Purchase Involvement	1.000	.833	No
Ego Involvement	.988	.030	Yes
Customer Loyalty			
Active Loyalty	.978	.003	Yes
Passive Loyalty	1.000	.702	No

The results shown in Table 6.1 reveal that switchers of DTAC mobile phone users are distinguished from non-switchers by five determinants including external information sources, interpersonal information search and experiential information search, ego involvement and active loyalty. Another two determinants comprising purchase involvement and passive loyalty do not influence the discrimination in switching behavior between the two groups of DTAC mobile phone users.

6.2 Conclusions

The number of the respondents in this research is 400 consisting of 216 switchers and 184 non-switchers. The majority of the respondents are female, accounting for 241 out of total 400 respondents. Most of them are aged between 18 and 27. A total of 47% of respondents have bachelor's degree. The largest group of respondents has income in the range of baht 10,001 – 20,000. Actually, there is not much difference in the usage period of DTAC mobile phone system among the respondents, in that, 29% of the respondents have used DTAC mobile

phone system for more than 1 year but less than 2 years, which is similar to the number of respondents using DTAC mobile phone system for longer than 3 years. For switchers, who switched from other service providers to DTAC mobile phone system, the main reason for switching is dissatisfaction with pricing, accounting for 74% of the respondents whereby the minor factor leading to switching is moving out from the service areas which accounted for only 4% of the respondents.

According to the result of hypothesis testing, the research concludes that the independent factors that can distinguish switchers from non-switchers are five out of seven studied variables. These are external information sources, interpersonal information search and experiential information search, ego involvement and active loyalty. Each variable's characteristics can be summarized as follows:

1. **Information Search**

- **External sources of information**

External information sources for this research include reading information in printed media and paying attention to advertising through TV and radio. According to the results of the study, the two groups of DTAC mobile phone users, representing 80% of respondents, engage in external sources of information search when making a purchase decision or switching the service provider. However, it is indicated that non-switchers with weighed mean of 4.0924 use more external sources of information than switchers, whose weighed mean is at 3.8611. This factor, thus, influences switching behavior of DTAC mobile phone users (switchers and non-switchers).

- **Interpersonal sources of information**

Interpersonal information acquired through opinions from salespersons, friends, relatives and customers is a factor influencing the discrimination between the two groups of DTAC mobile phone users (switchers and non-switchers). The result of the study shows that non-switchers with the weighed mean of 3.6775 are more likely than switchers to rely on interpersonal information source.

- **Experiential sources of information**

Experiential sources of information, which include reliance on past experience and trial, are also factors influencing the discrimination between the two groups of DTAC mobile phone users. Switchers with weighed mean of 3.5579 rely on experiential information sources more than non-switchers. Reliance on past experience is the most important source of information for switchers while non-switchers rely more on trial.

In conclusion, the results of this research show that all sources of information search are influential factors that distinguish switchers from non-switchers. DTAC mobile phone users engage in information search before making a purchase decision or switching the service providers, the findings of which can be supported by the study of Murry (1991). Furthermore, the results of the research show that switchers and non-switchers have obtained their information from different sources, which is in line with the study of Keaveney & Parthasarathy (2001) on the concept of preferences for different sources of information relevant to customers' perception and experiences.

2. **Involvement**

■ **Purchase Involvement**

The results of this research show that purchase involvement has no power to distinguish switchers from non-switchers. The average weighed means of purchase involvement for both groups of DTAC mobile phone users (switchers and non-switchers) were at scale 4, which indicates quite high purchase involvement. The results are supportive of Keaveney & Parthasarathy's (2001) study, which found that involvement customers engage in greater pre-purchase search.

■ **Ego Involvement**

Ego involvement is one of the influential factors, which distinguish two groups of DTAC mobile phone users. The average weighed means of ego involvement for both groups of DTAC mobile phone users were at scale 3 to 4. However, the research shows that brand image is less important for switchers than non-switchers when making a purchase decision or switching the service providers. According to the study of Ganesh, Arnold & Reynolds (2000), ego involvement is influenced by experiences and is significant in discriminating the two groups of DTAC mobile phone users (switchers and non-switchers).

3. Customer Loyalty

- Active loyalty

The results of this research found that active loyalty also has a power to distinguish switchers from non-switchers. The average weighed means of active loyalty for switchers and non-switchers show slight differences at 3.6991 and 3.8696, respectively. This implies that non-switchers are more likely than switchers to recommend DTAC to their friends and associates and to have intention of using more services in the future. This is confirmed by Ganesh, Arnold & Reynolds' (2000) study that non-switchers, who have never experienced dissatisfaction, exhibit more active loyalty than switchers.

- Passive loyalty

The results of this research show that passive loyalty has no power to distinguish switchers from non-switchers. Average means of both groups of DTAC mobile phone users are equal at scale 2.4. In addition, both switchers and non-switchers similarly focus on pricing and value-added services when making purchasing or switching decision.

The findings of this study are useful for DTAC in developing appropriate marketing strategies and business plan. The important implication for DTAC is that five out of seven studied factors including external information sources, interpersonal information sources, experiential information sources, ego involvement and active loyalty have power to distinguish switchers from non-

switchers while purchase involvement and passive loyalty are not the influential factors in discriminating the two groups of DTAC mobile phone users. Thus, several approaches should be considered so as to ensure customers' understanding of the services and products and to stimulate persuasive word-of-mouth matching with the target groups of DTAC mobile phone users. Furthermore, DTAC management team does not need to separately develop marketing strategies and plans with an aim to prevent switching owing to the finding that both groups are mainly concerned with pricing and value-added services.

6.3 Recommendations

Based on the results of this study, the researcher would like to provide the following recommendations for DTAC to develop the appropriate marketing strategies to fit its customers' need.

- To use appropriate sources of information suitable for the groups of **DTAC** mobile phone users

The results show that switchers are distinguished from non-switchers by all sources of information search. As switchers and non-switchers use different types of information sources to evaluate their purchase or switching decision. Switchers, who had experiences with the mobile phone services, use their experiences together with other sources of information when switching. On the contrary, non-switchers do not use their own prior experiences or knowledge when purchasing a mobile phone system. Incentive in terms of trial is likely to motivate the potential customers to acquire some experiences with DTAC

products. However, both groups of DTAC mobile phone users employ high degree of external sources of information. Thus, DTAC should train its service employees as well as DTAC's dealers and franchisees to acquire knowledge and understanding of the company's products and servicing processes so as to ensure effective communication, thereby preventing switching. Consequently, this leads to the enhancement of not only customer satisfaction but also persuasive WOM information. Finally, implementing the appropriate sources of information help DTAC reduce advertising expenses.

- **To create customer loyalty**

Owing to the intense competition in mobile phone industry, value-added services are also one of the important marketing strategies for DTAC to maintain its existing customer base as well as to acquire new subscribers. The higher degree of customer loyalty leads to positive WOM recommendation and encouraging more usage.

- **To set the attractive promotion**

The results show that pricing is the key driver for DTAC mobile phone users when making a purchase decision or switching the service providers. The attractive pricing promotion should be developed to match the income level. The largest group of this study accounting for 81.3% have income of less than Baht 20,000 per month. Nowadays, all service providers employ pricing strategy to increase the number of subscribers. DTAC, thus, should focus on competitive pricing program to prevent switching as well as to acquire new subscribers. A

well-communicated approach of information and product-knowledge to the customers is recommended for enhancing WOM referral of not only more service usage to the existing customers but also to attract new customers to the firm.

- To encourage involvement

According to the findings about involvement, switching behavior of DTAC mobile phone users is discriminated when determined by ego involvement but purchase involvement is not the factor in discriminating the two groups of DTAC mobile phone users. In such event, DTAC should develop customer retention strategies and customer acquisition plans at both pre- and post-purchase stages of the customers' decision process. Over the pre-purchase stage, DTAC should boost customer involvement in the decision-making process by means of more accessible and attractive approach for information search, increase in trial and other experiential opportunity through its DTAC dealers and franchise shops. For the post-purchase stage, marketing strategies should be developed to increase customer satisfaction, involvement and service usage, leading to lower possibility of customer switching.

Suggestions for further research

This research was conducted to examine what factors of information search, involvement and customer loyalty influence the discrimination between switchers and non-switchers. Some suggestions for further research are offered.

- Further research might examine the generalizability of results across other types of service such as banking, insurance, health-care and other membership-based services.

- The study of relationship between switching behavior and other relevant variables such as demographic factors, duration of usage are also recommended for further research.

- As described in the literature review about switching cost, further research might examine the degree to which acquiring information, involvement and customer loyalty are affected by switching cost.

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Appendix A:

English and Thai Questionnaires

QUESTIONNAIRE

This questionnaire is designed for studying the influence of information search, involvement and loyalty on switching behavior of DTAC's mobile phone users. The survey is conducted as a partial fulfillment of the academic requirement for the degree of Master of Business Administration, Assumption University. Your response is very useful for this research. Thank you in advance for your precious time and efforts in answering this questionnaire.

Part I: General Information

Please put X on the item you agree with or is accurate.

1. Had you ever used any other mobile phone systems before switching to DTAC?

   ____Yes ____No (Go to No. 3.)

2. What is the main reason for switching the service providers? (can answer more than one)

   Dissatisfaction with the previous service providers due to (can answer more than one)

   ____ Pricing ____ Service quality

   _____ Signal quality ____ Inconveniences of location

   _____ Network coverage

   Job relocation / Move the living place out from the service areas

   Other reasons _____

3. How long have you used DTAC's mobile phone system?

   Less than 1 year

   More than 1 year but less than 2 years

   More than 2 years but less than 3 years

   Longer than 3 years

Part II: Behavioral and attitudinal factors influencing on switching behavior

Please mark X in the space that best describes your decision-making when purchasing or switching to the service provider.

Information Search	Strongly agree 5	Agree 4	Neutral 3	Disagree 2	Strongly disagree 1
External sources					
4. You read available information from printed media (brochures, pamphlet, point-of-purchase display, others information given by service providers, third-party report, magazine, newspaper) before purchasing or switching to DTAC.					
5. You pay attention to advertising through TV, Radio before purchasing or switching to DTAC.					
Interpersonal sources					
6. You ask the opinion of the sales person before purchasing or switching to DTAC.					
7. You ask the opinion from friends, relatives before purchasing or switching to DTAC.					
8. You ask the opinion from previous or current DTAC's users before purchasing or switching to DTAC.					
Experiential sources					
9. You rely on past experiences before purchasing or switching to DTAC.					
10. You ask for trial at DTAC's shops or dealers before purchasing/ switching					

Involvement	Strongly agree 5	Agree 4	Neutral 3	Disagree 2	Strongly disagree 1
Purchase involvement 11. You constantly compare the prices and offers by various service providers.					
12. You compared the service attributes (quality, network, value-added products, service encounter, convenience, etc.) among service providers before you selected DTAC.					
13. You have discussed about your choice with other people after purchasing / switching service provider.					
14. You have evaluated the pros and cons of DTAC after purchasing or switching.					
Ego Involvement 15. The brand image plays a major role in your decision.					
16. It is important for you to choose DTAC that 'feels' right					
17. You took many factors into account before purchasing or switching to DTAC.					

Loyalty	Strongly agree 5	Agree 4	Neutral 3	Disagree 2	Strongly disagree 1
Active Loyalty 18. You would definitely recommend DTAC to your friends and associates.					
19. In the future, you intend to use more services offered by DTAC.					
Passive Loyalty 20. You would not switch to any other service providers even though they offer better packages or value-added services.					
21. You would still continue to be DTAC's customer although it raises the price.					

Part III: Personal Data

Please mark X in the space that is appropriate for you.

22. Gender

Male Female

23. Age

18 – 27 years old 28 – 38 years old

39 – 47 years old More than 47 years old

24. Education Level

High School graduate or less Diploma / Certification

Bachelor Degree Master Degree or higher

25. Income per month

Less than baht 10,000 Baht 10,000 – 20,000

Baht 20,001 – 30,000 More than baht 30,001

Thank you for your kindness to answer this questionnaire

แบบส บถาม

แบบสอบถามนี้เป็นส่วนหนึ่งของวิทยานิพนธ์ ระดับปริญญาโท เพื่อศึกษาปัจจัยที่มีผ
กระทบต่อพฤติกรรมก ารเปลี่ยนระบบการใช้บริการโทรศัพท์มือถือเคลื่อนที่ ผู้ใช้บริการระบบโทรศัพท์มือถือ
เคลื่อนที่ของดีแทค ทั้งนี้ข้อมูลที่ได้จากแบบสอบถามจะนำไปใช้เพื่อประโยชน์ทางการศึกษาเท่านั้น
กรุณาสละเว เและให้ความร่วมมือในการตอบแบบสอบถาม

ส่วนที่ 1: ข้อ_____

ากรณาทำเครื่องหมายกากบาท (X) หน้าคำตอบท่านเลือก

3. ท่านเคยใช้ระบบเครือข่ายบริการโทรศัพท์มือถือเคลื่อนถือระบบอื่นๆ ก่อนที่จะเปลี่ยนมาใช้ระบบเครือข่ายบริการ โทรศัพท์มือถือเคลื่อนถือของ ดีแทค

   เคย 13.1LAU (i13-11,tiVraLriN 3)

4. ท่านมีเหตุผลใดในการเปลี่ยนระบบเครือข่ายบริการโทรศัพท์มือถือเคลื่อนถือจากระบบเดิมมาใช้ (สามารถ ตอบได้มากกว่า 1 ข้อ)

   ไม่พอใจกับการให้บริการของระบบเครือข่ายบริการโทรศัพท์มือถือระบบเดิม ในเรื่อง
   (สามารถ.ลือกได้มากกว่า 1 it)

   _____ ราคา คุณภาพการให้บริการ
   _____ คุณภาพของสัญญาณ พื้นที่ให้บริการ
   _____ ความสะดวกในเรื่องที่ตั้งของศูนย์บริการ
   _____

   ที่อยู่อาศัย ไปยังที่ไม่มีสัญญาณของระบบโทรศัพท์มือถือเคลื่อนที่ของ ดีแทค
   เหตุผลอนๆ _____

4. ท่านใช้บริการระบบ.ครือข่ายบริการโทรศัพท์มือถือเค นถือของ ดีแทคมานานเท่าไร

   น้อยกว่า 1 ปี
   เกินกว่า 111 แต่ไม่เกิน 2 ปี
   เกินกว่า 211 แต่ไม่เกิน 311
   เกินกว่า 3 ปี

ส่วนที่ 2: พฤติกรรมและทัศนคติเกี่ยวกั ารบริโภคที่มีผลต่อการเปลี่ยนระ บเครือข่ายบริการโทรศัพท์

กรุณาทำเครื่องหมายกากบาท (X) ในช่อง หน้าคำตอบที่ท่านคิดว่าเหมาะสมในการตัดสินใจในการซื้อหรือเ ปลี่ยนระบบเครือข่ายบริการโทรศัพท์มือถือเคลื่อนถือ(โดยอาศัยประสบการณ์ของท่านในการซื้อหรือเป ยนระบบเครือข่ายบริการโทรศัพท์มือถือเคลือนถือ)

การค้นหาข้อมูลประกอบการตัดสินใจ	เห็นด้วยอย่างยิง 5	เห็นด้วย 4	ไม่มีความเห็น 3	ไม่เห็นด้วย 2	ไม่เห็นด้วยอย่ างยิง 1
4. คุณอ่านจากข้อมูลทีมีอยู่ — แผ่นพิมพ์โฆษณ า จุดขายสินค้า สื่อโฆษณาต่างๆ, นิตยสาร แ ะ หนังสือพิมพ์					
5. คุณดูจากโฆษณ าทางโทรทัศน์ วิทยุ					
6. คุณสอบถามความเห็นจ ากผู้ข าย					
7. คุณสอบถามความเห็นจากเพื่อน ญาติ					
8. คุณสอบถามคว ามเหนจาก กค้าอืนของ ดีแทค					
9. คุณอาศัยประสบก ารณ์ทีมีอยู่					
10. ุณทดลองใช้จ ากตัวแทนจำหน่ายหรือศูนย์บริการของ Ma w)					
Involvement					
11. คุณได้เปรียบเทียบราคาและข้อเสนอของแ ะระบบเครือข่ายบริการโทรศัพท์มือถือเคลื่อนถือ					
12. ก่อนต ัดสินใจเลือกดีแทค คุณเปรียบเทียบคุณสมบัติของบริการของ เต่ละระบบเครือข่ายบริการโทรศัพท์มือถือเคลื่อนถือ(คุณภาพ เครือข่าย บริการเสริม การบริการ ความสะดวก ·lm)					
13. หลังจ ากตัดสินใจเลือกดีแทค คุณได้พูดคุยกับคนอื่นๆ เกี่ยวกับ ดีแทค					
14. ห งจากตัดสินใจเลือกดีแทค คุณได้มีการพิจารณาถึงข้อดี และข้อเสียของดีแทค					
15. ยี่ห้อเป็นปัจจัยสำคัญในการตัดสินใจของคุณ					
16. ความรู้สึ ว่าการตัดสินใจเลือกดีแทคเป็นการตัดสินใจที่ถูกต้อง เป็นสิงสำคัญสำหรับคุณ					
17. คุณได้พิจารณาถึงปัจจัยหลายๆ ย่างก่อนตัดสินใจเลือกดีแทค					

Loyalty	เห็นด้วยอย่างยิ่ง 5	เห็นด้วย 4	ไม่มีความเห็น 3	ไม่เห็นด้วย 2	ไม่เห็นด้วยอย่างยิ่ง 1
18. คุณจะแนะนำดีแทคให้กับเพื่อนและคนรอบข้างของคุณอย่างแน่นอน					
19. ในอนาคต คุณตั้งใจที่จะใช้บริการอย่างอื่นของดีแทคเพิ่มขึ้น					
20. คุณจะไม่เปลี่ยนระบบเครือข่ายบริการโทรศัพท์มือถือเคลื่อนที่จากดีแทคไปยังระบบอื่นๆ ถึงแม้ว่าระบบอื่นๆ จะมีบริการเสริมอื่นๆ					
21. คุณจะยังคงใช้บริการของดีแทคต่อไปถึงแม้ว่าจะมีการปรับราคาขึ้น					

ส่วนที่ 3: ข้อมูลส่วนตัว

กรุณาทำเครื่องหมายกากบาท (X) ในช่อง

22. เพศ

23. อายุ

18 — 27 ปี
28 — 38 ปี
39 — 47
มากกว่า 48 ปี

24. ระดับการศึกษา

มัธยมศึกษาหรือต่ำกว่า
นุปริญญา
สายวิชาชีพ
ปริญญาโท

25. Income per month

ต่ำกว่า 10,000 บาท
10,001 — 20,000 บาท
20,001 — 30,000 บาท
มากกว่า 30,001 บาท

ขอขอบคุณเป็นอย่างสูงที่สละเวลาในการตอบแบบสอบถามฉบับนี้

Appendix B:

Overview of DTAC's Background

OVERVIEW of DTAC's BACKGROUND

Total Access Communication PCL. ("TAC") was found in August 1989 as mobile phone operator. Then, TAC, in March 2001, launched new brand name 'DTAC' whose market share at the end of year 2003 was 29.30%, behind Advance Info Services PCL. Overview of DTAC can be summarized as follows:

Major Shareholders

As of 10 March, 2004, TAC's major shareholders consisted of UCOM holding 41.64% stake, followed by Telenor and TOT, which held the 29.94% and 9.03% stakes, respectively (TAC, 2003).

Revenue Sharing

Under the concession contract, TAC is liable to share its revenue with CAT at fixed percentages as follows:

Year	1991-1994	1995	1996-2005	2006-2010	2011-2018
% of concession fee	12	25	20	25	30

Source: TAC, 2002

Slogan

"DTAC makes it easy" is DTAC's slogan under the concept that DTAC's customers are at the core of what DTAC does. EASY refers to Effective, Accessible, Sincere and Yours. TAC's annual report for the year 2002 clearly mentioned the meaning of these words as follows:

- *Effective: We set goals and we achieve them without wasting time and resources. It requires each and every one of us to be accountable to ourselves, our colleagues, our customers and our investors (TAC, 2002 pp.2).*

- *Accessible: Accessibility is the key to good communication. We are always friendly and approachable, we listen to what others have to say and we respond with well thought through answers and solutions (TAC, 2002 pp.10).*

- *Sincere: We are sincere in everything we say and do. We work tirelessly, selflessly (and always with a smile) to ensure that our promises and obligations are fulfilled. We openly share information colleagues and work together to find best solutions (TAC, 2002 pp.24).*

- *Yours: Above all, we have, are dedicated to being a positive and influential Force in the lives of all our customers, colleagues, stakeholders and the Thai Community at large. We use our innovative skills to make the world better place through both the solutions that we deliver and the manner in which we do so. We are part of the community and we are always at your service (TAC, 2002 pp.36).*

Vision

DTAC's vision as per TAC's annual report for the year 2002 stated that

"DTAC will be Thailand's telecommunication service company of choice, meeting the needs for communication and interaction among of people, businesses and communities that we serve" (TAC, 2002 pp.16).

Mission

DTAC's mission in TAC's annual report for the year 2002 stated that

"To be a world class telecommunication company which:

- *understands customer needs and provides innovative and effective solutions on a timely basis*
- *provides a challenging and rewarding work environment where employees flourish*
- *is trusted by all our stakeholders"(TAC, 2002 pp.16).*

Branding

The "DTAC" brand was launched in March 2001 with a slogan of "Makes It Easy". This supported its policy of transparent charging principles, fair pricing of innovative products and focusing on customer services (TAC, 2003).

Product types and packages

DTAC's customers can be divided into 2 groups: postpaid customers and prepaid customers. DTAC also offers various packages for each product type in the view that DTAC's customers are able to select a suitable package based on variable charging scheme depending on the level of usage (TAC, 2002).

As of 15 March, 2004, product packages for postpaid and prepaid markets offered by DTAC can be summarized in Table 1.2 and Table 1.3 as follows:

Table 1.2 Postpaid package by DTAC

Package	MY	Dlite	Dmedium	Dmax	Family	Maximize
Monthly Fee	No	THB 250	No	No	No	No
Bundle Fee	Start with THB 350	No	THB 750	THB 1,200	Start with THB 250	THB 1,200
Free minutes / month (minutes)	75	No	250	600	75	600
Tariff rates	After 75 minutes, a reduced airtime charge for every minute nationwide	THB 4 per minute nationwide	THB 3 per minute nationwide	THB 2 per minute nationwide	Same as MY	THB 2 per minute with 20% discount per call for more usage
Charging Method	Per-second billing	Same as MY	Same as MY	Same as MY	Same as MY	Same as MY

Source: TAC, 2003

Table 1.3 Prepaid package by DTAC

Package	Happy Dprompt	Baby SIM
Starter Kit	THB 500	THB 199
Free Minute / month	THB 100 with 40 day time span	THB 50 with 40 day time span
Monthly Fee	No	No
Tariff Rate (Airtime rate)	THB 5 / minute for normal time, nationwide THB 2.50 / minute for happy time, nationwide	THB 5 / minute nationwide
Charging Method	Per-second billing	Per-second billing
Refill card structure	THB 50 with 3 day time span THB 200 with 20 day time span THB 300 with 30 day time span THB 400 with 50 day time span	THB 50 with 5 day time span THB 200 with 30 day time span THB 300 with 45 day time span THB 400 with 50 day time span

Source: TAC, 2003

Value Added Services ("VAS")

DTAC offers VAS to its mobile phone users including Short Message Service (SMS), mobile internet portal, a nationwide GPRS (General Packet Radio Service) capability, wireless LAN and VPN services for the corporate market and MMS (Multimedia Message Service).

Customer Service

As at year 2002, service centers, DTAC shops and franchised shops had expanded to 500 locations throughout the country and had been developed to provide one-stop points of services with 10 service centers in Bangkok and 12 centers upcountry. Both DTAC's existing customers and the other persons who are interested in using DTAC's mobile phone system can obtain information about DTAC's products from these customer service centers.

Distribution channels

DTAC's distribution channels have been central in acquiring subscribers over the past 3 years. These include DTAC shops, independent dealers and non-telecom outlets. As at the end of 2002, there were 11 DTAC shops operated by DTAC itself, 396 franchised stores, 818 registered independent dealers with 1,500 outlets and 11, 685 non-telecom outlets such as convenience stores, mini-marts and gas stations (50-60% of which were up-country) (TAC, 2002).

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Market Development

Even though it is believed that the mobile phone market will continue to grow at a slower rate than in the past, all mobile phone operators have been facing with stiff competition as a result of the on-going liberalization of the Thai telecommunication market attracting possible new entrants (TAC, 2003). Due to intense competitive, mobile phone operators including DTAC have changed their marketing strategies to focusing on not only subscriber growth and market share but also increasing revenues and profitability. *To cope with the current circumstance, DTAC, in TAC's annual report for the year 2003, describes its marketing strategies as follows.*

1. *To be a leader launching innovative products for both voice and data services.*
2. *To meet the needs of market segments.*
3. *To cooperate with partners to develop business solutions and expand network distribution.*
4. *To enhance the quality of customer services; and*
5. *To improve the quality of the cellular network.*

Appendix C:

Reliability Test

Table 1: Reliability Test for Information Search

****** Method 1 (space saver) will be used for this analysis ******

RELIABILITY ANALYSIS - SCALE (ALPHA)

1. EX_READ External Source - Read inf. from printed
2. EX_ADV External Source - Advertising
3. IN_SALES Internal Source - Salesperson
4. IN_FRIEN Internal Source - Friends / Relatives
5. IN_CUST Internal Source - Previous or Current DT
6. EXP_EXPE Experiential Source - Past Experiences
7. EXP_TRAI Experiential Source - Trail

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	26.0000	12.9474	3.5982	7

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
EX_READ	22.1500	9.9237	.5258	.6231
EX_ADV	22.4000	10.1474	.4066	.6498
IN_SALES	22.7500	7.3553	.8885	.4834
IN_FRIEN	22.0000	10.2105	.4145	.6482
IN_CUST	22.3500	9.2921	.4893	.6246
EXP_EXPE	21.8500	10.8711	.4472	.6501
EXP_TRAI	22.5000	12.2632	-.0786	.8076

Reliability Coefficients

N of Cases = 20.0 N of Items = 7

Alpha = .6867

Table 2: Reliability Test for Involvement

****** Method 1 (space saver) will be used for this analysis ******

RELIABILITY ANALYSIS - SCALE (ALPHA)

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	26.5500	25.1026	5.0103	7

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
P_PRICE	22.4500	18.8921	.6785	.7997
P_QUALI	22.5000	19.1053	.7366	.7947
P_DISCUS	22.9500	18.5763	.6022	.8099
P_EVALUA	22.5500	18.6816	.5658	.8161
E_BRAND	22.8500	18.0289	.5122	.8309
E_FEEL	23.5500	18.8921	.5064	.8271
E_FACTOR	22.4500	20.4711	.6333	.8120

Reliability Coefficients

N of Cases = 20.0 N of Items = 7

Alpha = .8351

Table 3: Reliability Test for Loyalty

****** Method 1 (space saver) will be used for this analysis ******

RELIABILITY ANALYSIS - SCALE (ALPHA)

Statistics for	Mean	Variance	Std Dev	N of Variables
SCALE	11.9000	7.5684	2.7511	4

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Alpha if Item Deleted
L_RECOM	8.6000	4.7789	.6129	.8177
L_USE	8.5500	5.2079	.6240	.8186
L_REMAIN	9.1500	3.7132	.7842	.7399
L_CONTI	9.4000	4.2526	.6894	.7853

Reliability Coefficients

N of Cases = 20.0 N of Items = 4

Alpha = .8373

Appendix D:

Results of Discriminant Analysis

		Case Number	Actual Group	Highest Group				Second Highest Group			Discriminant Scores
				Predicted Group	P(D>d | G=g)	P(G=g | D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g | D=d)	Squared Mahalanobis Distance to Centroid	Function 1
Original	1	2	2	0.557		0.567	0.345	1	0.433	0.883	-0.237
	2	2	2	.44		0.912	0.596	[illegible]	0.088	5.285	-. 597
	3	1	1	0.296		.94	1.091	[illegible]	.0	6.512	1 747
	4	[illegible]	1	0.412		0.918	0.[illegible]3	[illegible]	0.082	5.509	1 5 [illegible]
	5	2	1(**)	0.576		0.527	0.313	[illegible]	0.423	0.986	0.1 [illegible]
	6	[illegible]	2	0.024		[illegible]	5.098	1	.0[illegible]	.323	-3.0 2
	7	[illegible]	2	0.069		0.981	3.303	1	0.019	11 132	-2.612
	8	[illegible]	1	0.8		0.825	0.054	2	0.175	3.16	0.9 5
	9	[illegible]	1	0.762		0.83[illegible]	0.088	2	0.16	3.32	0.9 8
	0	1	2 (**)	0.933		0.[illegible]5	0.002	1	0.215	2.59	-0.9 9
	[illegible]	2	2	0.723		0.846	0.126	1	0.154	3.53	-1 1 9
	2	1	1	.99		0.266	0	2	0.234	2.37	.7 5
	3	1	2(**)	0.625		0.821	0.239	1	0.2 9	[illegible] 6	.318
	[illegible]	1	1	0.[illegible]		0.756	[illegible]	2	0.2 4	2.264	.6 8
	5	[illegible]	2	0.955		0.7[illegible]	0.003	[illegible]	0.222	2.502	-0.881
	[illegible]	2	2	0.7[illegible]		0.676	.68	[illegible]	0.32[illegible]	1 5 9	-0.5 2
	[illegible]	[illegible]	2	0.822		0.8[illegible]9	0 6	[illegible]	0.1 [illegible]	2 0 6	-1.049
	8	[illegible]	2	0.798		0.685	0 065	[illegible]	0.3 5	1 6 6	-0 569
	9	[illegible]	2	0.701		0.64[illegible]	0 148	[illegible]	0.3 [illegible]9	1 3 5	[illegible]
	20	1	1	0.[illegible]6		0.954	1 916	2	0.036	8.4 2	2.086
	21	1	1	0.907		0.723	0 014	2	0.202	2.	[illegible]89
	22	2	2	0.486		0.908	0 485	[illegible]	0.092	4.9 8	-1 521
	23	1		0.883		0.801	0 022	[illegible]	0.199	2.8 1	0.[illegible] 9
	24	[illegible]		0.558		0.564	0 352	[illegible]	0.4 6	0.8 1	0 [illegible]9
	2[illegible]	1		0.268		0.9[illegible]6	1 228	[illegible]	0.0 4	6.9 2	.81
	26	[illegible]		0.681		0.60[illegible]	0 2[illegible]1	[illegible]	0.394	1 0 4	0.222
	27	1		0.983		0.768	0	[illegible]	0.232	2.3 7	0.724

		Case Number	Actual Group	Highest Group				Second Highest Group			Discriminant Scores
				Predicted Group	P(D>d | G=g)	P(G=g | D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g | D=d)	Squared Mahalanobis Distance to Centroid	Function 1
Original		1	1		1		0.0 8		0 6	3.38	1 015
		1	2 *)		1		0.0 9		0 8	3.05	1.045
		1			1	0.633	0.1		0 36	1.25	0 295
		1	1		1		0.2 5		0.249	1.375	
		1			1		2.2 7		0 03	9 35	2.215
		1			1	0.752	0 0 1		0.24	2.23	0.66
		1		0.439	1	0.913	0.5 9		0.087	5.293	1.476
					1	0.957	1.6 1	1	0.043	7.01	.094
			2(**)	0.466	1	0.513	0.5 1	1	0.487	63	-0.096
		1	1		1		0.1		0.21	1.229	.264
		1	1		1	949	1.3 9		0.051	7.1 9	1.855
		1	1	0.439	1	0.913	0.599		0.087	5.293	1.476
		1	(**)	0.545	1	.56	0.367		.4	0.848	-0.218
		1	2(**)	0.533	1	0.553	0.389	1	4	0.8 5	
				0.595	1	587	0.78	1	4 3	09 09	-0.29
			2(**)	0.919	1	789	.(		0.21	2.65	-0.926
				0.404	1	.92	0.69		.0	5.58	-1.659
			1(**)	0.8	1	818	0.049		0.182	059	525
			2	0.4	1	516	052		484	0.649	0.103
			2	0.2	1	.65	0.12		.3	1.369	-0.468
		1	1	446	1	911	..	2	0.08	5.236	1.464
		1	1	0.8	1	825	0.064		0.175	168	0.955
			1(*	49	1	532	0.46		0.468	0.71	00
				88	1	29	002		0.2 1	2.78	-0.956
		1	1	.81	1	.69	0.050		.31	1.655	0.462
		1	1	0.706	1	851	0.14		149	626	1.08
				0.506	1	898	0.441	1	0.102	4.80	1.489
				0.835	1		0.04	1	0.3	1 737	616
				0.988	1	0.758	0	1	024	2.286	-0.81
				0.61	1	59	0.255		0.403	1.0 4	0.3

				Highest Group				SecondHighest Group			Discriminant Scores
		Case Number	Actual Group	Predicted Group	P(D>d G=g)	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Function 1
Original	58	2	2	0.559	1	0.568	0.31	1	0.42	0.808	0.14
	59		1	0.979	1	0.977	0.001	2	0.02	2.43	-2.29
	60	2	1 (**)	0.825	1	0.696	0.09	2	0.34	1.7	-1.21
	61	1	1	0.829	1	0.717	0.10	2	0.23	3.0	-0.98
	62	1	1	0.833	1	0.716	0.045	2	0.24	3.0	-0.92
	63	1	1	0.872	1	0.819	0.051	2	0.21	3.0.	-0.92
	64	2	2	0.987	1	0.858	0.212	1	0.212	2.28	-0.83
	65	1	1	0.969	1	0.752	0.001	2	0.28	2.215	-0.64
	66	1	1	0.856	1	0.809	0.033	2	0.21	2.916	-0.83
	67	2	2	0.979	1	0.869	0.001	1	0.21	2.11	-0.85
	68	1	1	.672	1	86	0.101	2	01	3.83	1.18
	69	1	2(*)	0.554	1	0.569	.15	1	0.45	0.874	0.23
	70	1	1	0.926	1	0.947	261	2	0.03	7.02	1.85
	71	1	1	0.001	1	0.998	10.765	2	0.02	23.114	3.93
	72	2	1 **	0.35	1	0.745	0.004	2	0.255	2.14	.64
	73	2	2	0.492	1	0.901	0.422	1	0.01	4.89	-1.5 .
	74	1	1	0.113	1	0.973	2.545	2	0.02	9.68	2.288
	75	1	1	0.781	1	0.672	0.028	2	0.33	1.558	0.44
	76	1	2 **	0.775	1	0.875	0.081	1	0.35	1.545	0.59
	77	1	2 **	0.98	1	0.869	0.001	1	0.21	2.4.	0.85
	78	2	1 **	0.54	1	0.857	0.326	2	0.443	0.83	0.09
	79	1	2 **	0.795	1	0.883	0.057	1	0.32	1.606	0.57
	80	1	1	0.352	1	0.729	0.849	2	0.01	5.992	1.63
	81	2	1 **)	0.742	1	.686	0.109	2	.34	1.433	0.33
	82	2	2	0.929	1	0.886	0.008	1	0.24	2.63	0.14
	83	1	2 **)	0.522	1	0.884	0.329	1	0.16	4.374	-1.389
	84	2	2	0.822	1	0.817	0.047	1	0.183	3.043	1.02
	85	2	1 **)	0.474	1	0.518	0.052	2	0.482	0.658	.013
	86	2	2	0.96	1	0.823	3.541	1	0.027	11.61	2.26
	87	2	2	0.907	1	0.793	0.054	1	0.207	2.7	.91

		Case Number	Actual Group	Highest Group				Second Highest Group			Discriminant Scores
				Predicted Group	P(D>d G=g)	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Function 1
Original	88	1	1	1.37	1	0.927	0.805	2	0.073	5.875	.946
	89	1	2(**)	0.452	1	.91	0.566	1	.09	5.192	1.526
	90	2	2	0.349	1	0.931	0.828	1	0.069	6.069	-1.261
	91	2	1(**)	0.611	1	0.825	0.259	2	0.175	4.142	1.211
	92	2	2	0.552	1	0.888	0.353	1	0.112	4.498	-1.419
	93	1	1	0.201	1	0.852	0.142	2	0.148	3.648	.9086
	94	1	1	0.204	1	0.851	0.144	2	0.149	3.635	1.082
	95	1	1	0.032	1	0.987	4.348	2	0.013	13.04	2.282
	96	1	1	0.223	1	0.951	1.502	2	0.049	35	1.882
	97	1	1	0.559	1	0.559	1.332	2	0.441	.9844	0.094
	98	1	1	0.56	1	0.886	0.338	2	0.114	4.447	1.283
	99	1	1	0.926	1	0.787	0.075	2	0.213	2.621	0.795
	100	1	1	0.956	1	0.727	0.003	2	0.273	2.501	0.257
	101	1	2 **)	0.94	1	0.781	0.085	1	0.219	2.548	-0.894
	102	1	1	0.729	1	0.827	0.065	2	0.173	3.203	0.965
	103	1	1	0.814	1	0.691	0.055	2	0.309	1.668	0.462
	104	1	1	0.265	1	.67	0.085	2	1.33	4.509	0.941
	105	2	2	0.443	1	0.912	0.588	1	0.088	5.26	-1.591
	106	2	2	0.889	1	0.799	0.019	1	0.201	2.776	-0.764
	107	1	1	0.296	1	0.684	0.062	2	0.316	1.607	0.443
	108	2	2	0.225	1	0.652	0.124	1	0.348	1.379	-0.522
	109	1	1	0.121	1	0.963	1.822	2	0.037	.35	2.022
	110	1	1	0.225	1	0.832	0.082	2	0.168	3.284	0.908
	111	2	1(**)	0.406	1	0.909	0.691	2	0.081	5.56	1.526
	112	1	1	0.559	1	0.573	0.324	2	0.427	.0916	0.433
	113	2	2	0.132	1	0.969	2.240	1	0.031	00.3	-.231
	114	2	2	0.669	1	0.625	0.185	1	0.375	4207	-0.396
	115	1	1	0.232	1	0.695	0.128	2	0.345	1.401	0.350
	116	2	2	0.818	1	0.683	0.053	1	0.302	1.468	0.590
	117	2	2	0.888	1	0.721	.072	1	0.279	1.192	0.687

		Case Number	Actual Group	Highest Group				Second Highest Group			Discriminant Scores
				Predicted Group	P(D>d | G=g)	P(G=g | D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g | D=d)	Squared Mahalanobis Distance to Centroid	Function 1
Original	118	1	1	0.953		0.778	0.004	2	0.222	2.515	0.26
	119	1	1	0.979		0.77	0.006	2	0.23	2.412	0.229
	120	2	2	0.618		0.823	0.248	1	0.127	4.1	1.323
	121	2	1(**)	0.693		0.632	0.156	2	0.363	1.281	0.300
	122	2	1	0.984		0.257	0	2	0.243	2.221	0.683
	123	2	1(**)	0.108		0.539	0.437	2	0.461	0.249	0.041
	12	1	2(**)	0.699		0.64	0.5	1	0.36	1.298	-0.432
	12	2	2	0.196		0.853	0.153	1	0.142	3.675	-1.215
	12	1	1	0.969		0.751	0.002	2	0.249	2.213	0.663
	12	1	1	0.908		0.793	0.013	2	0.702	2.625	0.8.2
	128	1	1	0.192		0.962	2.108	2	0.033	8.871	2.154
	129	1	1	0.982		0.769	0.001	2	0.231	2.401	0.225
	130	1	1	0.031		0.988	4.633	2	0.012	13.135	2.855
	131	2	2	0.922		0.726	0.008	1	0.254	2.058	-0.732
	132	1	1	0.621		0.86	0.18	2	0.14	3.802	1.122
	133	2	1	0.659		0.868	0.194	2	0.187	3.871	1.143
	134	1	1	0.992		0.782	0.005	2	0.218	2.56	0.276
	135	1	2(**)	0.77		0.673	0.085	1	0.327	1.524	-0.532
	136	2	2	0.255		0.948	1.298	1	0.052	7.108	-1.964
	13	1	2(**	0.524		0.548	0.406	1	0.452	0.7 1	-0.182
	13	1	2 **	0.713		0.646	0.136	1	0.354	1.342	0.456
	13	1	2 **	0.306		0.939	1.05	1	0.061	6.509	1.849
	14	2	2	0.76		0.836	0.093	1	0.164	3.355	1.129
	14	2	1 **)	0.942		0.78	0.004	2	0.22	2.537	0.268
	14	1	2 **)	0.881		0.718	0.022	1	0.282	1.836	-0.625
	14	1	2 *)	0.559		0.887	0.342	1	0.113	4.458	1.409
	14	2	2	0.565		0.885	0.331	1	0.115	4.419	-1.4
	14	2	2	0.229		0.654	.12	1	0.346	1.393	0.428
	14	2	2	.66		0.621	0.9[illegible]	1	0.179	1.162	0.385
	14	2	2	0.421		0.516	0.519	1	0.4 4	0.5 5	0.104

				Highest Group				Second Highest Group			Discriminant Scores
		Case Number	Actual Group	Predicted Group	P(D>d | G=g	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Function 1
Original	144	2	2	0.171	1	0.963	1.828	1	0.037	8.893	2.115
	145	1	1	0.988	1	0.758	0	2	0.212	2.282	0.686
	150	2	1(**)	0.502	1	0.535	.45	2	0.465	0.233	0.032
	151	2	1(**)	0.321	1	0.916	0.64	2	0.084	5.439	1.508
	152	1	1	0.282	1	0.628	0.02	2	0.372	1.567	0.425
	153	2	1 **)	0.502	1	0.535	.45	2	0.465	0.233	0.032
	154	2	1 **)	0.321	1	0.546	0.413	2	0.454	0.282	-0.0
	155	2	2	0.375	1	0.936	0.788	1	0.02	5.829	1.712
	156	1	1	0.834	1	0.699	0.08	2	0.301	1.233	0.492
	157	1	1	0.249	1	0.663	0.103	2	0.337	1.455	0.382
	158	2	2	0.257	1	0.832	0.095	1	0.163	2.369	-1.135
	159	2	2	0.952	1	0.745	0.004	1	0.255	2.149	-0.267
	160	1	1	0.995	1	0.76	0	2	0.24	2.31	0.698
	161	2	1 **)	0.502	1	0.793	0.014	2	0.207	2.702	0.815
	162	2	1 **)	0.514	1	0.542	0.428	2	0.458	0.263	0.049
	163	1	1	0.961	1	0.726	0.002	2	0.224	2.482	0.251
	164	1	2(*)	0.266	1	0.621	0.088	1	0.379	1.512	-0.527
	165	1	2(*)	0.991	1	0.766	0	1	0.234	2.366	-0.816
	166	1	2(*)	0.991	1	.7	0.002	1	.27	2.003	-0.213
	167	1	1	0.947	1	.7	0.004	2	.22	2.537	0. 28
	168	1	2 *	0.875	1	0.710	0.025	1	0.284	1.874	0662
	169	1	2 *	0.795	1	0.531	0.461	1	0.469	0.212	-0.142
	170	1	1	0.223	1	0.954	1.486	2	0.046	7.538	1.921
	171	1	2 **	0.256	1	0.837	0.096	1	0.163	3.375	135
	172	2	2	0.467	1	0.514	0.529	1	0.486	0.039	-0.092
	173	1	1	0.972	1	0.753	0.001	2	0.247	2.255	0.667
	174	2	2	0.692	1	0.854	0.156	1	0.146	3.695	-1.22
	175	2	2	0.587	1	0.881	..3	1	0.119	4.301	1.322
	176	2	2	0.626	1	0.821	0.232	1	0.129	4.055	1.311
	177	2	2	0.884	1	0.637	0.166	1	0.363	1.254	0.418

		Ca e b er	Act al 0 roup	Highest Group				Second Highest Group			Discriminant Scores
				Predicted Group	P(> 0=g)	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	0 o p	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Function 1
Ori nal	178	1	1	0.428	.1	0.915	0.6ZZ	2	0.085	5.376	1.494
	179	1	1	0.659	.1	0.863	0.195	2	0.13Z	3.8Z4	1.144
	180	.1	1	0.377	1.	0.92	[illegible]	Z	0.025	5.808	1.586
	181	1	.1	0.539	.1	0.89	0.Z28	Z	0.109	4.58Z	1.31Z
	182	1	1	0.805	1	0.68	0.761	2	0.313	1.638	0.455
	183	Z	1(**Z	0.5Z3	[illegible]	0.5ZZ	0.Z8	Z	0.323	.22	0Z 8
	184	2	1(**)	.34	1	0.932	. 1	Z	0.068	6.153	1.656
	185	2	1(**Z	0.512	.1	0.89Z	0.429	Z	0.103	4.259	1.35Z
	186	2	2	0.265	.1	0.621	0.089	1	0.329	.51	-0.5
	187	2	1 **)	0.674	.1	0.628	0.1ZZ	2	0.3ZZ	1.223	0.282
	188	1	2 **Z	0.614	1	0.874	0.255	1	0.126	4.12Z	-1 3 9
	189	1	1.	0.048	.1	0.985	3.8	Z	0.015	12.26	2.6 Z
	190	2	Z	0.271	.4	0.945	1.214	1	0.055	6 909	-1.92
	191	1	1	0. 84	1	0.25Z	0	Z	0.243	2.269	0.68Z
	192	2	2	0.99Z	.1	0.263	[illegible]	1	0.23Z	2.34	-0. 29
	193	2	2	0.90Z	1	0.229	0.014	1	0.221	1.988	-0.Z0
	194	.1	1	0.95Z	1.	0.277	0.003	n1	0.523	.5	0.757
	195	Z	2	0.818	.1	0.693	0.053	1	0.30Z	1.682	0.59
	196	2	Z	0.226	.1	0.846	0.123	1	0.154	3.525	1Z
	197	1	1	0.509	.1	0.833	0.436	Z	0.10Z	4.284	1.363
	198	1	1	0.814	.1	0.821	0.055	2	0.129	3.103	0.93Z
	199	1	.1	0.553	1	0.888	0.349	Z	0.11Z	4.48Z	1.293
	200	1	1	0.611	.4	0.8Z4	0.250	2	0.126	1.14	1
	201	.1	1	0.701	.1	0.852	0.14Z	Z	0.148	3.649	1.0 8
	202	2	2	0.214	.1	0. 55	1.54Z	1	0.05	7.66	-2 166
	203	2	2	0.205	v.	0.957	1.60Z	1	0.043	7.888	-2. 192
	204	Z	Z	.59	1	0.585	.2	1	0.415	0.926	-0.286
	205	.1	2(**	0.629	.4	0.605	0.233	1	0.395	1 09	.342
	206	.1	1	0. 71	.1	0.ZZ2	0.001	2	0.228	2.341	0.23
	207	.1	1	0.Z14	.1	0.64Z	0.195	2	0.353	1.34	0.33

				Highest Group				Second Highest Group			Discriminant Scores
		Case Number	Actual Group	Predicted Group	P(D>d G=g)	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Function 1
Original	208	2	2	1**	1	0.792	0.013	1	0.208	2.688	-0.937
	209	2	1**	0.908	1	0.798	0.013	2	0.202	2.692	0.818
	210	1	1	0.757	1	0.837	0.006	2	0.163	3.327	1.012
	211	2	2	0.991	1	0.786	0.008	1	0.214	2.604	-0.911
	212	1	2	0.685	1	0.609	0.225	2	0.391	1.107	0.228
	213	1	1	0.586	1	0.788	0.296	2	0.212	4.288	1.246
	214	1	1	0.919	1	0.789	0.01	2	0.211	2.65	0.808
	215	2	2	0.807	1	0.823	0.05	1	0.177	3.135	-0.968
	216	2	2	0.125	1	0.962	1.84.	1	0.038	8.316	-2.131
	217	2	2	0.479	1	0.521	0.50	1	0.479	0.669	0.115
	218	1	1	0.821	1	0.694	0.05	2	0.306	1.692	0.476
	219	2	2	0.571	1	0.574	0.32	1	0.426	0.921	-0.253
	220	2	2	0.503	1	0.899	0.44.	1	0.101	4.822	-1.434
	221	2	2	0.961	1	0.776	0.00	1	0.224	2.483	-0.873
	222	1	1	0.884	1	0.72	0.02	2	0.28	1.907	0.556
	223	2	1(**)	0.492	1	0.532	0.46	2	0.468	0.717	0.022
	224	1	2**	0.912	1	0.732	0.01	2	0.268	2.024	0.398
	225	2	1(**)	0.502	1	0.535	0.45	2	0.465	0.733	0.032
	226	2	2	0.601	1	0.827	0.273	1	0.123	4.201	-1.317
	227	1	1	0.942	1	0.782	0.005	2	0.218	2.18	0.276
	228	2	2	0.615	1**	0.824	0.259	1	0.126	4.119	-1.327
	229	1	1	0.891	1	0.798	0.019	2	0.202	2.77	0.81
	230	1	1	0.484	1	0.903	0.49	2	0.097	4.952	1.402
	231	2	1(**)	0.858	1	0.808	0.092	2	0.192	3.81	0.881
	232	1	1	0.472	1	0.906	0.518	2	0.094	5.045	1.422
	233	2	1(**	0.847	1	0.812	0.09	2	0.188	2.952	0.895
	234	1	1	0.982	1	0.756	0.00	2	0.244	2.261	0.679
	235	2	2	0.29	1	0.942	1.118	1	0.058	6.627	-1.882
	236	2	2	0.308	1	0.938	1.01	1	0.062	6.485	-1.841
	237	2	2	0.165	1	0.964	1.92	1	0.036	8.501	-2.213

		Case Number	Actual Group	Highest Group				Second Highest Group			Discriminant Scores
				Predicted Group	P(D>d | G=g)	P(G=g | D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g | D=d)	Squared Mahalanobis Distance to Centroid	Function 1
Original	238	2	2	0.36	1	0.928	0.838	1	0.072	5.963	-1.74
	239	1	1	0.416	1	0.9[illegible]2	0.66	2	0.083	5.4[illegible]2	1.5[illegible]5
	240	1	1	0.684	1	0.633	0.166	2	0.362	1.253	0.295
	241	2	2	0.73	1	0.828	0.021	1	0.122	3.213	-1.09
	242	2	2	0.462	1	0.908	0.541	1	0.092	[illegible]	-[illegible]56
	243	2	2	0.063	1	0.982	3.458	1	0.018	11.[illegible]66	-2.384
	244	1	1	0.565	1	0.521	0.331	2	0.429	0.906	0.127
	245	2	2	0.342	1	0.931	0.884	1	0.069	6.086	-1.765
	246	1	2(**)	0.635	1	0.608	0.226	1	0.392	1.106	-0.349
	247	2	2	0.342	1	0.931	0.885	1	0.069	6.088	[illegible]
	248	2	2	0.68[illegible]	1	0.631	0.169	1	0.369	1.[illegible]3	[illegible]13
	249	2	2	0.16[illegible]	1	0.965	1.963	1	0.035	8.571	-2.2[illegible]
	250	2	2	0.03	1	0.982	4.386	1	0.013	13.024	-2.9[illegible]2
	251	2	2	0.51	1	0.543	0.422	1	0.452	0.769	-0.175
	252	1	1	0.55	1	0.563	0.358	2	0.437	0.864	0.104
	253	1	1	0.58	1	0.88	0.292	2	0.12	4.274	1.243
	254	2	2	0.52[illegible]	1	0.884	0.32	1	0.118	4.579	-1.39
	255	2	2	0.493	1	0.959	1.692	1	0.041	2.998	-2.125
	256	1	1	0.622	1	0.622	0.[illegible]29	2	0.323	1.218	0.279
	257	1	2(**)	0.243	1	0.841	0.107	1	0.159	3.438	.152
	258	2	2	0.912	1	0.73	0.012	1	0.27	2.[illegible]	-0.713
	259	[illegible]	1	0.149	1	0.962	2.082	2	0.033	8.[illegible]	2.145
	260	[illegible]	1	0.983	1	0.752	0	2	0.243	2.268	0.6[illegible]2
	261	[illegible]	1	0.813	1	0.681	0.056	2	0.309	1.[illegible]6	0.4[illegible]6
	262	1	1	0.339	1	0.658	0.114	2	0.342	1.424	0.369
	263	2	2	0.736	1	0.951	1.406	1	0.049	2.3[illegible]2	.01
	264	2	2	0.006	1	0.995	7.432	1	0.005	[illegible]95	3.5[illegible]2
	265	1	2(**)	0.752	1	0.839	0.1	1	0.161	3.396	[illegible]111
	266	2	2	0.394	1	0.292	0.018	1	0.203	2.758	0.958
	267	1	[illegible]	0.332	1	0.658	0.112	2	0.342	1.419	0.367

		Case Number	Actual Group	Highest Group				Second Highest Group			Discriminant Scores
				Predicted Group	P(D>d IG=g)	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Function 1
	268	1	1	0.512	1	0.541	0.481	2	0.459	0.258	0.046
	269	2	2	0.871	1	0.804	0.026	1	0.196	2.853	0.982
	228	2	2	0.494	1	0.901	0.962	1	0.099	4.883	-1.588
	221	2	2	0.016	1	0.992	5.809	1	0.008	15.49	-3.233
	222	1	1	0.551	1	0.563	0.396	2	0.432	0.855	0.106
	223	2	2	0.748	1	0.668	0.103	1	0.332	4.452	0.503
	224	2	2	0.256	1	0.946	4.231	1	0.054	10.962	-1.938
	225	1	1	0.634	1	0.608	0.222	2	0.392	4.103	0.226
	226	1	1	0.266	1	0.835	0.089	2	0.165	3.33	1
	222	1		0.223	1	0.674	0.084	2	0.326	4.532	0.413
	228	2	2	0.981	1	0.904	0.496	1	0.096	4.876	52
	229	1	1	0.986	1	0.762	8	2	0.233	2.383	0.219
	280	1	1	0.094	1	0.926	2.8	2	0.024	10.24	2.326
	281	1	2 *)	0.819	1	0.81	0.052	1	0.18	3.02	.053
	282	2	2	0.224	1	0.954	1.422	1	0.046	2.519	-2.04
	283	2	2	0.23	1	0.628	0.026	1	0.372	1.566	0.549
	284	2	2	0.59	1	0.89	0.360	1	0.11	4.53	-1.472
	285	2	2	0.88	1	0.718	0.022	1	0.282	1.89	-0.625
	286	2	2	0.92	1	0.735	0.009	1	0.265	2.35	-0.72
	282	2	1 *	0.294	1	0.683	0.008	2	0.312	1.600	0.441
	288	2	2	0.246	1	0.91	4.842	1	0.05	7.322	-1.985
	289	1	1	0.286	1	0.942	1.139	2	0.058	6.72	1.2
	290	2	2	0.226	1	0.944	1.178	1	0.056	6.823	-1.91
	291	1	1	0.864	1	0.712	0.021	2	0.288	1.838	0.58
	292	2	1 **	0.508	1	0.539	0.932	2	0.461	0.7	0.041
	293	2	2	0.889	1	0.928	0.29	1	0.022	5.699	1.685
	294	1	1	0.576	1	0.629	0.174	2	0.321	1.23	0.25
	295	2	2	0.355	1	0.929	0.852	1	0.021	6.015	1.75
	296	2	2	0.039	1	0.202	0.041	1	0.398	1.252	0.62
	292	1	1	0.268	1	0.834	0.087	2	0.166	3.319	0.59

		Case Number	Actual Group	Highest Group				Second Highest Group			Discriminant Scores
				Predicted Group	P(D>d IG=g)	P(G=g ID=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g ID=d)	Squared Mahalanobis Distance to Centroid	Function 1
Original	298	2	2	0.503	1	0.886	0.33[illegible]	1	0.114	4.432	-1.4 3
	299	1	1	0.880	1	0.8	0.024	2	.2	2.791	0.846
	300	2	2	0.282	1	0.943	1.158	1	0.057	6.274	1.9
	301	2	1 **)	0.554	1	0.565	.35	2	0.435	0.874	0.1 1
	302	1	1	0.492	1	0.902	0.473	2	0.098	9.904	1.39
	303	1	1	0.706	1	0.643	0.142	2	0.357	1.322	0.3 [illegible]
	304	1	1	0.707	1	0.671	0.088	2	0.329	4.514	0.4 6
	305	1	1	0.755	1	0.838	0.097	2	0.102	3. 8	1.0 [illegible]
	306	1	1	0.315	1	0.937	1.009	2	0.063	0.407	1.707
	307	1	2 **	0.896	1	0.724	0.017	1	0.276	1.998	-0.79
	308	1	1	0.324	1	0.930	0.972	2	0.065	0.312	1.68
	309	1	1	.84	1	0.814	0.041	2	0.180	2.988	0.90
	310	1	2 **	0.520	1	0.894	0.404	1	0.106	4.677	-1.4
	311	2	1 **	0.971	1	0.777	0.801	2	0.228	2.441	0.73
	312	1	2 **	0.684	1	0.633	0.166	1	0.367	1.254	0.4
	313	2	2	0.150	1	0.960	2.009	1	0.035	8.067	-2.24
	314	1	2(**)	0.832	1	0.699	0.095	1	0.301	1 73	-0.6
	315	1	1	0.390	1	0.934	0.887	2	0.069	6.093	1.64
	316	1	2 **)	0.601	1	0.862	0.192	1	0.138	3.863	-2 3
	317	1	2 **)	0.950	1	0.777	0.003	1	0.223	2.504	-0.8
	318	1	1	0.88	1	0.718	0.023	2	0.282	1.897	0.55
	319	1	1	0.782	1	0.678	0.076	2	0.322	1.563	0.42
	320	2	1(**	0.873	1	0.715	0.025	2	0.285	1.869	0.54
	321	1	1	0.379	1	0.925	0.773	2	0.070	5.787	1.58
	322	1	2 **)	0.460	1	0.513	0.533	1	0.487	0.635	-0.0
	323	1	1	0.097	1	0.970	2.753	2	0.074	10.149	2.3
	324	1	1	0.928	1	0.737	0.008	2	0.203	2.065	0.6
	325	2	2	0.787	1	0.677	0.077	1	0.323	1.561	.54
	326	1	1	0.710	1	0.648	0.132	2	0.352	1.353	0.33
	327	2	2	0.689	1	.61	0.221	1	.39	1.117	0.35

				Highest Group				Second Highest Group			Discriminant Scores
		Case Number	Actual Group	Predicted Group	P(D>d IG=g)	P(G=g ID=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g ID=d)	Squared Mahalanobis Distance to Centroid	Function 1
Origin	328	1	2 **	0425	1	05	.51	1	0481	066	0 11
	329	1	1	.13	1	097	2.295	2	003	9.25	2.27
	330	1	1	0656	1	0639	15	N	086	1.292	0.3
	331	N	1 **	0653	1	0557	037	2	0443	0834	0089
	332	1	1	0651	1	0897	043	N	0 03	4 763	358
	333	1	1	0.338	1	0933	0912	2	0067	6 17	1.66
	334	1	1	.98	1	0255	0001	N	0245	2.254	0.67
	335	1	1	N	1	0858	1.6	2	004	7.88	983
	336	1	2 **)	0.684	1	0633	0166		0367	254	0418
	337	N	N	0.253	1	0665	009	1	0833	1.47	-0 51
	338	1	1	0.553	1	0888	0352	2	0 1	4.583	1.45
	339	1	1	0.348	1	0931	0881	N	006	6.028	1.641
	340	N	1(*	0 85	1	0.51	0534	N	0 488	9633	0029
	341	N	N	0.7 8	1	0684	0066	1	0316	614	0368
	342	1	1	0.405	1	092	0692	2	.08	5.564	1.534
	343	1	1	0.8	1	081	0085	N	019	2.834	0.888
	344	N	1(**)	0.58	1	088	0809	N	011	4.338	1.258
	345	1	2(**	0.743	1	.6	0 08	1	0 31	436	0196
	346	N	1(**	0.485	1	0525	04 8	N	0 475	0685	003
	347	1	1	0.111	1	0 2	2.5 3	N	0 02	2 43	2.97
	348	1	1	0.801	1	0825	0 0 3	N	0175	3.163	0854
	349	N	1(**	0.526	1	0894	04 3	N	0106	4.621	337
	350	1	1	0.28	1	0 4	1 4	N	005	6.89	1.262
	351	1	1	.N	1	0852	1 9	N	0148	3.657	083
	352	1	1	02N	1	0854	1.4	N	0.046	7.545	2 4
	353	N	1(**	035	1	0245	0.0 4	N	0255	143	0.14
	354	N	N	018	1	0858	1 1		0142	3.763	-1.238
	355	N	1 *	0904	1	0254	0.0 5	N	0206	24	0.8 3
	356	N	N	016	1	0862	1 3		013	3.867	-1.264
	35	1	2 **	071	1	028	001	1	012	3.212	-1.09

		Case Number	Actual Group	Highest Group				Second Highest Group			Discriminant Scores
				Predicted Group	P(D>d G=g)	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Function 1
Original	358	2	1(**)	0.452	1	0.504	0.565	2	0.496	0.601	-0.04
	359	1	1	0.093	1	0.972	2.8 2	2	0.023	10.[illegible]8	2.382
	360	2	2	0.597	1	0.588	).28	1	0.4[illegible]2	0985	-0.2 5
	361	1	1	0.1 8	1	0.965	1.998	2	0.035	8 644	2.116
	362	1	1	0.247	1	0.949	1.339	2	0.051	7 804	1. 6
	363	2	2	0.764	1	0.835	0 0[illegible]	1	0.1[illegible]5	3 332	-[illegible].125
	364	1	1	0.625	1	0.859	0 175	2	0.141	3 285	1.121
	365	1	[illegible]	0.4[illegible]4	[illegible]	0.[illegible]905	0.512	2	0.095	5 829	1 4 8
	366	2	2	0.325	1	0.826	0.[illegible]88	1	0.02[illegible]	5 828	-[illegible].712
	367	2	2	0.896	1	0.29[illegible]	0.01[illegible]	1	0.[illegible]03	2.[illegible]4)	0 956
	368	2	2	0.[illegible]41	1	0.[illegible]968	2.164	[illegible]	0.03[illegible]	8 986	2 29
	369	2	2	0.[illegible]68	1	0.[illegible]73	0.00[illegible]	1	0.[illegible]27	2.453	-0.86
	370	2	2	0.[illegible]27	1	0.754	0.001	1	0.246	2.[illegible]43	0.79
	371	1	1	0.[illegible]59	1	0.908	0.547	[illegible]	0.092	5 1[illegible]2	1.442
	372	2	1(**)	0.622	1	0.602	0.243	[illegible]	0.398	1.06)	021
	373	2	1(**)	0.[illegible]02	1	0.535	).45	[illegible]	0.465	0.[illegible]33	0.032
	374	1		0.[illegible]38	1	0.89[illegible]	).38	2	0.108	[illegible] [illegible]93	1.319
	375	1	1	0.[illegible]89	1	0.845	).[illegible]2	2	0.155	3 509	1.049
	376	2	1(**)	0.[illegible]05	1	0.531	0 466	[illegible]	0.469	0.[illegible]13	).02
	377	[illegible]	2	0.[illegible]06	1	0.688	).06	[illegible]	0.312	1.641	-0.579
	378	2	1(**)	0.[illegible]45	1	0.[illegible]43	0 0 5	[illegible]	0.[illegible]52	2.123	0633
	379	2	2	).82	1	0.819	0.0 2	1	0.181	3 0[illegible]6	-1.052
	380	2	. 2	0.178	1	0.962	1.8 2	[illegible]	0.038	8 2[illegible]	-[illegible].17
	381	1	1	0.514	1	0.89[illegible]	0 4 7	2	0.103	4.254	1.[illegible] 5
	382	[illegible]	1	0.508	[illegible]	0.539	0.4. 7	2	0.461	0 [illegible]49	0. 001
	383	1	1	0.[illegible]45	1	95	1.3 1	[illegible]	).05	[illegible] 231	1.[illegible]85
	384	2	[illegible]	0.854	1	0.[illegible]08	0.0 4	1	0.29[illegible]	1 801	0 .04
	385	[illegible]	2	0 029	1	0.989	4 [illegible]11	1	0.011	13.[illegible]2	[illegible].002
	386	1	1	0.[illegible]3	1	0.[illegible]98	0.0 8	[illegible]	0.20[illegible]	2 76	0.837
	387	1	1	0.[illegible]43	1	).89	0.3 1	[illegible]	).11	4 56	1.31[illegible]

		Case Number	Actual Group	Highest Group				Second Highest Group			Discriminant Scores
				Predicted Group	P(D>d G=g)	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Group	P(G=g D=d)	Squared Mahalanobis Distance to Centroid	Function 1
Original	388	2	2	0.193		0.[illegible]59	1.698	1	0.04	8.006	.122
	389	2	2	0.[illegible]2		0.051	0.126	1	0.34	1.322	-0.469
	390	2	2	0.[illegible]33		0.[illegible]	0.938	1	0.06	[illegible]26	-1.7[illegible]3
	391	2	2	0.[illegible]82		0.299	.02	1	0.20	2.[illegible]6	902
	392	2	2	0.02[illegible]		0.989	4.845	1	0.01	13.8 2	.026
	393	2	1(**)	0.[illegible]		0.021	0.193	2	0.32	[illegible]182	0.263
	394	1	1	0.[illegible]08		0.[illegible]98	0.438	2	0.102	4.291	[illegible]364
	395	1	1	0.615		0.874	0.253	2	0.12	4.12	1.205
	396	2	2	0.59[illegible]		0.587	0.28[illegible]	1	0.413	0.988	-0.292
	397	2	2	0.129		0.[illegible]7	2.299	1	0.[illegible]3	9.258	-[illegible].34
	398	1	1	0.812		0.82	0.054	2	0.[illegible]8	[illegible].091	0.[illegible]34
	399	1	1	0.[illegible]		0.8[illegible]3	0.152	2	0.142	[illegible].075	[illegible]093
	400	1	1	0.171		0.9[illegible]	[illegible].875	2	0.032	8.380	2.071

[illegible]

[illegible]

** Misclassified case