FACTORS INFLUENCING CONSUMER BRAND CHOICE OF TOP 3 TAXI BOOKING MOBILE APPLICATIONS IN BANGKOK: UBER, GRABTAXI AND EASY TAXI

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Factors Influencing Consumer Brand Choice of Top 3 Taxi Booking Mobile Applications in Bangkok: Uber, GrabTaxi and Easy Taxi (109 pp.)

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ABSTRACT

Taxis are the popular transportation in Bangkok because travelling by taxi is very convenient and also time-saving in some scenario compare with other public transportation. On the other hand, travelling by taxi also found a lot of problem as well. In recent year, people use more of smart phone and electronic gadget. Smart phone and mobile application technology is growing up more popular in Thailand. The E-hailing innovation came to take part in taxi industry and it works very well in Bangkok. But the question is what are the factors that influence people to make decision on brand choice? This paper proposes a framework of factors influencing consumer brand choice of top 3 taxi booking mobile applications in Bangkok: Uber, GrabTaxi and Easy Taxi. This research is conducted to show the relationship between influential factor and consumer brand choice.

The research analysis is based on qualified 400 questionnaires that were collected from October, 2015 until January, 2016 by random population who experience this E-hailing service of Uber, GrabTaxi and Easy Taxi in Bangkok.

According to the objective of this research, the research focuses on the result of the factors that influence people to make decision on brand choice. The result has been

gathered from the questionnaires done by the people who use service from one of three taxi apps' brand. The following is the study of relationship between marketing mix, mobile apps, brand, consumer behavior and consumer brand choice of top three taxi booking apps.

Furthermore, business people, firms, developer, and marketing expert can enhance more effectiveness of consumers need, increase customer base and grow the business in this industry using marketing strategies to fulfill consumers' need.

Keywords: *Brand choice, Taxi booking, Uber, GrabTaxi, Easy taxi, Mobile applications, Bangkok*

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TABLE OF CONTENTS

Page

TABLE OF CONTENTS (Continued)

Page

TABLE OF CONTENTS (Continued)

Page

TABLE OF CONTENTS (Continued)

Page

LIST OF TABLES

Page

LIST OF TABLES (Continued)

Page

LIST OF FIGURES

Page

CHAPTER 1

INTRODUCTION

1.1 Background

Nowadays, convenience is one of the most important factors for people who live in the cities especially people who does not have car or often use public transportation. Taxi is one of the most convenient transportations in Bangkok, the capital of Thailand. People choose taxi to make their life more convenient, faster and easier to reach their destination.

However, they sometimes have problem to catch the taxi. For example, passenger cannot find any taxi in the area, or being overcharged. Some taxi driver is rude or gives a bad service, such as, refuse to go by meters, refused to take passengers, did not know the directions, and lacked of service mind. Department of land transport identify that there are almost 30,000 number of passengers complain that taxi refuse passengers (Department of land transport, 2015).When people start to notice these problems, it leads to the creation of taxi booking mobile application which aims to see the better changes in the society.

In Bangkok, there are 3 most popular taxi applications: Uber, GrabTaxi and Easy Taxi. These 3 applications have little differences in details, but they have same purpose which is to make people life more convenient; however, the popularity and number of users are different.

The advantages of taxis booking mobile applications is that the driver tends to get less refuse to take the passengers; moreover, passengers can check driver’s profile

and leave feedback for another user after using the service. They can check their lost items from application, and for the payment method they can pay by credit card and get rid of the drivers that don't have changes in some applications. Plus, these taxi applications offer discount and promotion that normal taxi has never offered to passengers.

1.2 Statement of Problem

In 2013, there are around 120,000 of taxis in Thailand, and around 80,000 taxis are registered in taxi companies which are more than 40 companies in Bangkok. There are around 108,500 taxis in Bangkok which is such a large number of taxis, but passengers still have problem using the service. For example, passenger cannot find any taxi in the area, or being overcharged. Some taxi driver is rude or gives a bad service, such as, refuse to go by meters, refused to take passengers, did not know the directions, and lacked of service mind. (Modernine TV, 2013)

In October 2011-September 2012 and October 2012-September 2013, it was the most often reported time of problems in using taxis by 20,162 passengers. The below table is the problems of using taxi in Bangkok in October 2011-September 2012 and October 2012-September 2013.

Table 1.1: Taxi problem reported

Sequence	**Plaint**	Oct 2011-Sep 2012	Oct 2012-Sep 2013	**Total**
		Number	**Number**	
1	Refused to take passengers	10,330	9,832	20,162
2	Being rude	2,642	1,981	4,623
3	Delivered to wrong destination	2,153	3,614	5,767
4	Took passengers to a detour	1,066	995	2,061
5	Driving in a reckless manner	834	587	1,421
6	Refused to go by meters	787	1,426	2,213
7	Used equipment incorrect (fast meters, dark tinted windows)	677	435	1,112
8	Charged excess fare	482	522	1,004
9	Others(dressing, smoking)	501	791	1,292
Total		19,472	20,183	39,655

Source: Taxi Problem Reported. (2013). *Prachachat*.

Retrieved from http://www.prachachat.net/news_detail.php?

newsid =1371625073

According to the statistics above, it was such a huge problem for people who often used taxis service, this leads to the solution of taxi booking mobile applications which are aim to see better services. There are many taxi booking mobile applications launching in Bangkok and many cities across the world, but what factors bring these 3

applications to be the top 3 taxi applications are. They might give the solution of better taxi services or fulfill the customer satisfactions.

1.3 Intention and Reason for Study

In this research, the researcher's purpose is to study the factors influencing consumer brand choices of top 3 taxi booking mobile applications in Bangkok: Uber, GrabTaxi and Easy Taxi. Another reason is that researcher is interested in the idea of business startup in transportation field and technology of new generation who notices the weakness of the current system and uses the creative ideas and technologies to solve the problem.

1.4 Research Objectives

The objective of this research could be separated into 3 major objectives:

1. To study the marketing factors influencing consumer brand choices of top 3 taxi booking mobile applications in Bangkok: Uber, GrabTaxi and Easy Taxi.
2. To study consumer behaviors influencing consumer brand choices of top 3 taxi booking mobile applications in Bangkok: Uber, GrabTaxi and Easy Taxi.

1.5 Research Questions

1. What is the most influential factor in marketing mix toward consumer brand choices of top 3 taxi booking mobile applications in Bangkok: Uber, Grabtaxi and Easy Taxi?

2. Is social media and influential people related to their purchasing decision of top 3 taxi booking mobile applications in Bangkok: Uber, GrabTaxi and Easy Taxi?
3. Is the role or function of application important for brand choice?

1.6 Scope of Study

The questionnaires which concern with the consumer brand choices by focusing on the possible mode such as marketing mix (7Ps), applications, brand name, consumer behavior and demographic will be used in this independent study.

The researcher uses questionnaire as an instrument of survey and defined the scope of study as follow:

1.6.1 Scope of Content

In this study, the researcher examined and identified the relationship of marketing mix, mobile application, brand, and consumer behaviors toward top 3 taxi booking mobile applications: Uber, GrabTaxi and Easy Taxi in Bangkok, Thailand. This study is a quantitative research based on the concept of the factor influencing consumer brand choices as well as related research.

1.6.2 Scope of Demographic, Samples and Location.

The researcher identified population and sample as taxi passengers located in Bangkok, Thailand. This research will be survey on the people who

have used or often used the taxi booking mobile applications: Uber, GrabTaxi and Easy Taxi within Bangkok.

1.6.3 Scope of Related Variables.

In this study, variables are presented accordingly to the proposed hypothesis as follow;

Dependent variable

Consumer brand choice of top 3 taxi booking mobile applications in Bangkok

Independent variable

H1 Service

H2 Price

H3 Place

H4 Promotion

H5 Physical evidence

H6 Process

H7 People

H8 Mobile Application

H9 Brand Name

H10 Consumer Behavior

Hypothesis

Hypothesis can be explained as below;

- H1o: βService, Security, Convenience = 0
- H1a: At least one of βService, Security, Convenience ≠ 0

- H2o: βReasonable, Cash payment, Credit card payment = 0
- H2a: At least one of βReasonable, Cash payment, Credit card payment ≠ 0

- H3o: βAvailability in business area, Availability in residential area, Availability of taxi number =0
- H3a: At least one of βAvailability in business area, Availability in residential area, Availability of taxi number ≠ 0

- H4o: βDiscount, Special Offers, Advertising = 0
- H4a: At least one of βDiscount, Special Offers, Advertising ≠ 0

- H5o: βCar condition, Car type, Cleanliness = 0
- H5a: At least one of βCar condition, Car type, Cleanliness ≠ 0

- H6o: βOnline booking, Service during the trip, Giving feedback = 0
- H6a: At least one of βOnline booking, Service during the trip, Giving feedback ≠0

- H7o: βFriendliness and Politeness, Knowledge and skill, Trust and credibility = 0
- H7a: At least one of βFriendliness and Politeness, Knowledge and skill, Trust and credibility ≠ 0

- H8a: βSimplicity, Clear, user-friendly navigation, Good use of color, Well-formatted content, Speed/ Fast load time, Professional web/app design = 0
- H8o: At least one of βSimplicity, Clear, user-friendly navigation, Good use of color, Well-formatted content, Speed/ Fast load time, Professional web/app design ≠ 0

- H9o: βBrand Awareness , Brand Loyalty, Brand Reputation = 0
- H9a: At least one of βBrand Awareness , Brand Loyalty, Brand Reputation ≠ 0

- H10o: βEconomic situation , Lifestyles, Influential people, Social network, Social trend = 0
- H10a: At least one of βEconomic situation , Lifestyles, Influential people, Social network, Social trend ≠ 0

The research has been conducted between October2015 – January2016 based in Bangkok, Thailand.

1.7 Limitations of Research

To study and research the topic of Factors Influencing Consumer Brand Choice of Top 3 Taxi Booking Mobile Applications in Bangkok: Uber, GrabTaxi and Easy Taxi, the researcher has to make a clear focus and limitation on the independent variables that will positively or negatively influence the dependent variable so as to keep the study and research within the specific research structure. The study is confined by focusing on only three brand taxi booking mobile applications which are Uber, GrabTaxi and Easy Taxi in Bangkok, Thailand.

In Bangkok, most of the people knew taxi booking mobile applications but there are still not many people using taxi booking mobile applications because people are get used to call taxi by traditional way which can be the obstacle to find attendant of the survey. Furthermore, in researching and collecting information, the researcher finds that 50% of the information that can be used in conducting this study is in Thai language which is not the researcher's first language. The researcher translated the information from Thai to English and tried to maintain the meanings as much as possible.

1.8 Assumptions

The main factors which are service, price, place, promotion, car condition, process, driver, mobile application, brand name and consumer behavior could affect consumer's brand choice among 3 taxi booking mobile applications Uber, GrabTaxi and Easy Taxi in Bangkok, Thailand.

1.9 Benefits of Research

- To have a better understanding the relationship between main factors (service, price, place, promotion, car condition, process, driver, mobile application, brand and consumer behavior) toward consumer brand choice to choose services among three taxi booking mobile applications in Bangkok, Thailand.
- To provide the research information to who need to develop more effective taxi booking mobile applications, to decrease and to solve the problem in using taxi and public transportation
- To study and analyze the difference of the service among Uber, Grabtaxi and Easy Taxi.
- The research result could be useful for marketing expert who interested to understand the behavior of Thai taxi's consumers.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This paper is focusing on factor influencing consumer brand choice. The researcher starts this chapter by studying on mobile applications and taxi booking mobile applications which are related to the topic of this research. In taxi booking mobile applications topic, Uber, GrabTaxi and Easy Taxi will be defined and studied. After that, brand, consumer behavior and marketing mix (7Ps) will be examined. And last, conceptual framework will be conducted and make clear overview of this research.

2.2 Mobile Applications

The American Dialect Society voted “app” (noun, an abbreviated form of application, a software program for a computer or phone operating system) as the word of the year for 2010.

The researcher followed the definition defined by Wigmore I. (2013) that a mobile app is a software application developed specifically for use on small, wireless computing devices, such as smartphones and tablets, rather than desktop or laptop computers. These mobile apps are built to make things easier for the users; they have

different design and color from their website template. Moreover, they are designed for user-friendly site navigation and high speed load time.

2.3 Taxi Booking Mobile Applications

2.3.1 Uber

Uber is a taxi E-hailing mobile application established Travis Kalanick, the Co-founder and Chief Executive Officer and Garrett M. Camp, the Co-founder and Chairman of Uber since March 2009, which headquartered in San Francisco, California. The Uber service is now available in 311 cities and 58 countries around the world. (Travis, 2015) The concept of this app is to submit trip request from the passenger's smart phone and send to nearest Uber driver who use his own car. Uber will track the Uber car to pick passengers up by location from their smart phone. When the passengers reach their destination, they can rate scores of the driver and the driver can also do the same. A receipt will be automatically sent to their email.

2.3.2 Grabtaxi

GrabTaxi is one of the most popular taxi booking mobile applications in Thailand. It is an automated location based smartphone booking and dispatch platform for the taxi industry, now operates in 6 countries in the South-east Asia which are Malaysia, Philippines, Thailand, Singapore, Vietnam, and Indonesia. (GrabTaxi, n.d.)

GrabTaxi was officially launched to the public on June 2012. As of March 2015, the number of taxi drivers registered in the network has increased to 75,000 and currently seven bookings were made every second. Now it reached a total number of 3.8 million mobile application users across Southeast Asia. (GrabTaxi, n.d.) Their purpose is to promote and introduce cost effectiveness and simplicity of mobile-based technology to both taxi company side and passenger side. Their principle is "Safety, Certainty and Speed".

2.3.3 Easy Taxi

Easy Taxi is a mobile E-hailing application founded in 2011 by four founders: Tallis Gomes, Daniel Cohen, Vinicius Gracia and Marcio William. The company official launched the app in April 2012. In the beginning, Rio de Janeiro was a test market, while its headquarters is in Sao Paulo, Brazil. Within the first year of operations, the company got more than 5000 drivers and 200,000 downloads. (Redação, 2013) Now it is available in 30 countries, 420 cities (Easy Taxi, Abdul Hannan Tago, 2014). As of December 2014, the company reached 17 million users and more than 400,000 taxi drivers joined with an Easy Taxi network.(Guimarães, 2013)

2.3.4 Top 3 taxi booking mobile application in Bangkok

Table 2.1 Comparison of 3 taxi calling apps: Easy Taxi, GrabTaxi, Uber

	Traditional taxi services	**Easy Taxi**	**GrabTaxi**	**UberX**	**Uber Black**
Cost per Km.	5Baht/Km. *increase 50Satang/ 10 Km.	5Baht/Km. *increase 50Satang/ 10 Km.	5Baht/Km. *increase 50Satang/ 10 Km.	4.5Baht/Km.	9.2Baht/Km.
Cost per minute	-	-	-	1 Baht/Minute	2.5 Baht/Minute
The minimum fare	-	-	-	45 Baht	75 Baht
Payment	Cash	Cash/ Credit card	Cash/ Credit card	Credit card	Credit card
Tolls	Pay separately from the fares	Pay separately from the fares	Pay separately from the fares	Include in receipt	Include in receipt
Share the fares	By cash	By cash	By cash	By visa	By visa
Number of cars	~108,500 (2013)	~800	~800	A little	Little
Check the fares	Meter	Meter	Meter	Estimate by app	Estimate by app
Fares start at	When getting into the car	When getting into the car	When getting into the car	When getting into the car	When getting into the car
Advance calling	-	-	Yes	-	-
Show the current location of the taxi and estimate time of waiting.	-	Yes	Yes	Yes	Yes

(Continued)

Table 2.1(Continued): Comparison of 3 taxi calling apps: Easy Taxi, GrabTaxi, Uber

	Traditional taxi services	**Easy Taxi**	**GrabTaxi**	**UberX**	**Uber Black**
Able to share trip information	-	-	Yes	Yes	Yes
Feedback	-	Yes	Yes	Yes	Yes
Android	-	Google play	Google play	Google play	Google play
iOS	-	iTunes	iTunes	iTunes	iTunes
Windows Phone	-	Windows Phone	Windows Phone	Windows Phone	Windows Phone
Taxi booking fees	20 Baht	20 Baht	25 Baht	-	-
Fares at 0-1 Km.	35 Baht	35 Baht	35 Baht	25 Baht	45 Baht
Car types	Taxi	Taxi	Taxi	Normal car with black coloured registration plate	Limousine with green coloured registration plate

Source: Gimme. (2014). *Comparison of 3 taxi calling apps: Easy Taxi, Grabtaxi, Uber*. Retrieved from http://droidsans.com/compare-taxi-caller-apps-easytaxi-grabtaxi-uber

There are a lot of Taxi booking apps in Bangkok, such as GrabTaxi, Easy Taxi, Uber, All Thai Taxi and Smart Taxi. (Five Apps, Ramirez, 2015) However, most of people still get used to traditional taxi service. In this research studies top 3 most often used apps which are GrabTaxi, Easy Taxi, Uber. Table 2.1 is the comparison of offline taxi service and top 3 apps, for Uber it was categorized into 2 types: Uber X and Uber Black.

2.4 Brand

For customer view, brand is an important part that shows the value of any products or companies. It is perceptions that represent a company, product or service; plus, it is the essence or promise of what will be delivered or experienced. Brand also refers to a name, term, design, logo, symbol or audio jingle. (Brand, n.d.) Brand can identify the image and uniqueness of the products and differentiate themselves from competitors. It also contains a level of credibility, quality, and satisfaction.

2.4.1 Brand Awareness

Awareness is the ability to perceive, to feel, or to be conscious of events, objects, thoughts, emotions, or sensory patterns. (Brand awareness, n.d.)

Brand awareness refers to the strength of a brand's presence in the consumer's mind. Brand awareness can provide a host of competitive advantages for the marketer. These include the following (Aaker, 1996):

- Brand awareness renders the brand with a sense of familiarity.
- Name awareness can be a sign of presence, commitment and substance.
- The salience of a brand will decide if it is recalled at a key time in the purchasing process.
- Brand awareness is an asset that can be inordinately durable and thus sustainable.

Brand awareness can influence consumer loyalty and decision-making by affecting the establishing and strength of brand image.

2.4.2 Brand Loyalty

Being loyal is when you say no to other brands in the same product-category even if they are better than the brand you choose. Loyalty gives an advantage to the firms, as they can handle competition in lower price and develop the products much better when having loyal consumers

Brand loyalty is important for several reasons such as reducing the production cost due to sales volume is high, spending less money on advertising, using premium price for increasing profit margin and word of mouth by loyal customers. It is very important to have loyal customers, company need to point out the advantage of the product over competitor's one.

The below figure is showing the Loyalty pyramid by David A. Aaker

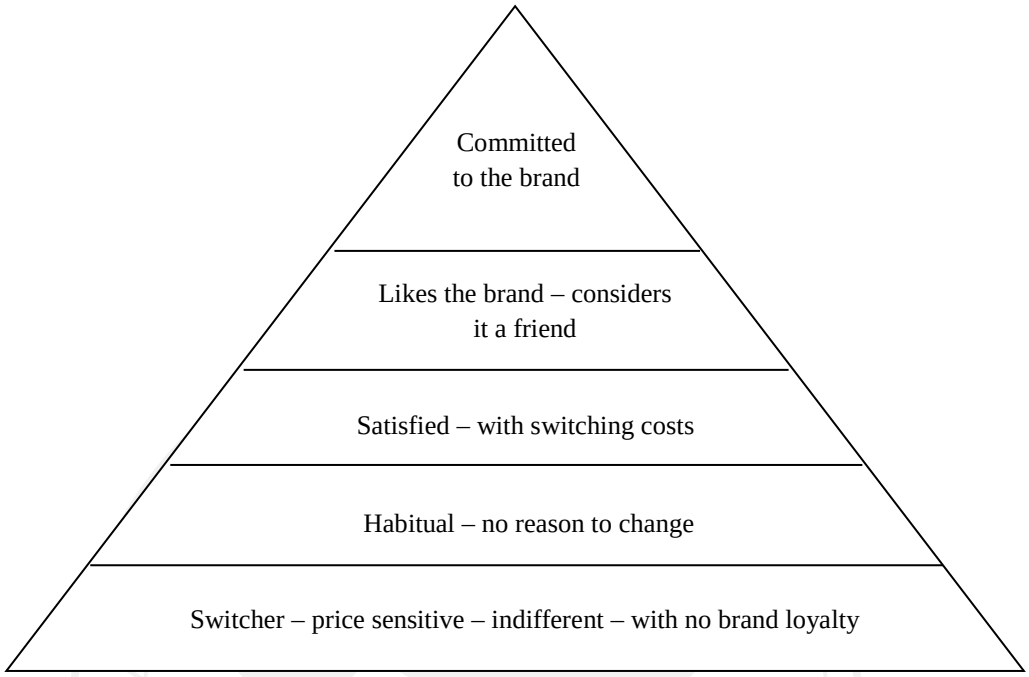

Figure 2.1: The Loyalty Pyramid

Source: Aaker, D. A. (1991). *Managing Brand Equity: Capitalizing on the Value of a Brand Name.* New York: The Free Press.

From the figure, the first level represents non loyal customers who do not care much about brand name and can change the brand if they see differences in price. So, brand does not affect their decision making.

Second level is group of customers who buy the brand out of their habit. These kinds of customers don't see any reason to change their purchasing behavior. If they cannot find the brand they often used in the shop, they are going to choose another brand instead of going to another shop.

Third, it consists of satisfied customers with switching cost.

Forth level is all about emotion, quality and experience, customers are truly like the brand and logo, they have good perception on the brand or they have a long term relationship with the brand.

Last, it represents committed customers who proud to use the brand. For them, brand can express their personality and they also give recommendation to others.

2.5 Consumer Behavior

As defined by Kuester, Sabine (2012), consumer behavior is the study of individuals, groups, or organizations and the processes they use to select, secure, use, and dispose of products, services, experiences, or ideas to satisfy needs and the impacts that these processes have on the consumer and society.

From Lynn R. Kahle, Angeline G. Close's study (as cited in Asaad Ali Karam), consumer behavior blends elements from psychology, sociology, social anthropology, marketing and economics. It helps business people to understand the decision-making processes of buyers, both individually and in groups such as how emotions affect purchasing behavior. It studies characteristics of individual consumers such as demographics and behavioral variables in an attempt to understand customer's need. It also assesses influences on the consumer from groups such as family, friends, sports, reference groups, and society in general.

2.6 Marketing Mix (7Ps)

Marketing mix is a marketing strategy tools which often crucial when determining a product or brand's offer, and is often associated with the four Ps. A four Ps classification was presented by the marketing expert E. Jerome McCarthy in 1960, which consists of product, price, promotion and place. The "seven Ps" is a marketing model added to the four Ps mentioned above. It's including physical evidence, people, and process. It is used when the relevant product is a service, not a physical good.

2.7 Rational Model

The rational model is the process of realizing a problem, establishing and evaluating planning criteria, creating alternatives, implementing alternatives, and monitoring progress of the alternatives. It is used in designing neighborhoods, cities, and regions. The rational planning model is central in the development of modern urban planning and transportation planning. The very similar rational decision-making model, as it is called in organizational behavior is a process for making logically sound decisions. (Robbins, Stephen, & Judge, 2007)

This multi-step model aims to be logical and follows the orderly path from problem identification through solution.

1. Formulating a goal(s)

2. Identifying the criteria for making the decision
3. Identifying alternatives
4. Performing analysis
5. Making a final decision.

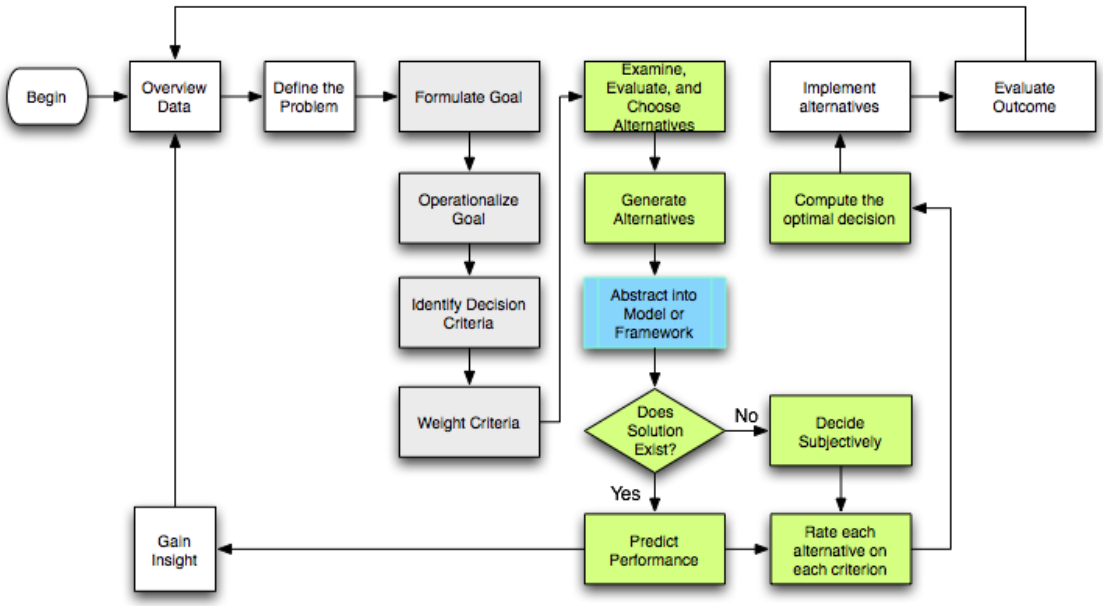

Figure 2.2: Rational Model

Source: Boundless, (2015). *Rational Decision Making*. Retrieved from https://www.boundless.com/management/textbooks/boundless-management-textbook/decision-making-10/rational-and-nonrational-decision-making-76/rational-decision-making-369-8376/

2.8 Research Framework

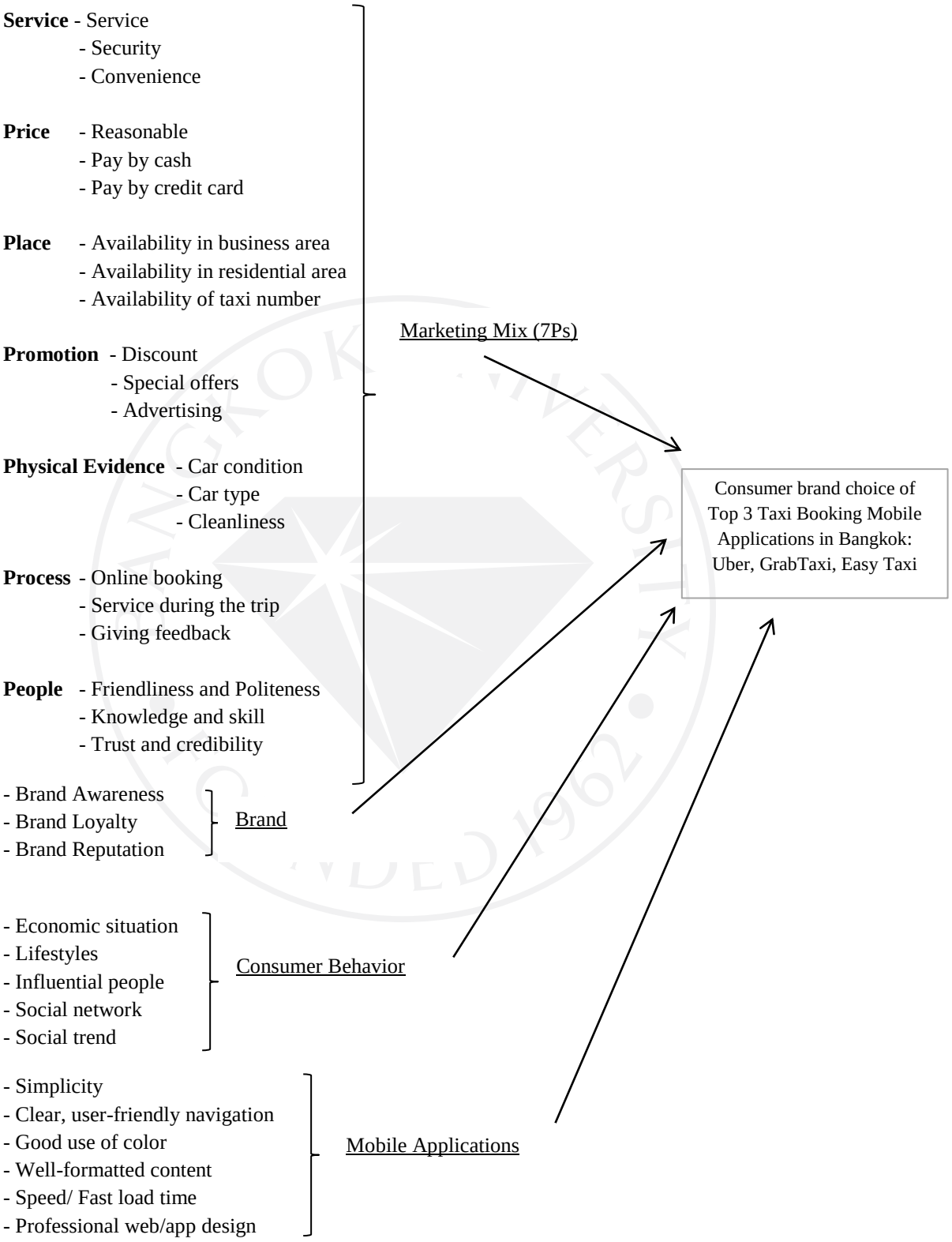

Figure 2.3: Theoretical Framework

This research studies the relationship between marketing mix (7Ps), mobile applications, consumer behavior, brand and demographic toward choices decision of top 3 taxi booking mobile applications in Bangkok. There are four sets of independent variable including marketing mix (7Ps), mobile applications, consumer behavior and brand, and 1 dependent variable which is taxi brand choice. The questionnaire will be made to be specific and conformity with conceptual framework.

Variable

Dependent variable

Consumer brand choice of top 3 taxi booking mobile applications in Bangkok

Independent variable

H1 Service

H2 Price

H3 Place

H4 Promotion

H5 Physical evidence

H6 Process

H7 People

H8 Mobile Application

H9 Brand Name

H10 Consumer Behavior

Hypotheses

As shown in the previous framework, there are 4 sets of independent variables including mobile apps, brand name, consumer behavior, and marketing mix (7Ps). Dependent variable is consumer brand choice. The information of demographic will be kept as general information of survey attendants.

- H1o: βService, Security, Convenience = 0
- H1a: At least one of βService, Security, Convenience ≠ 0

- H2o: βReasonable, Cash payment, Credit card payment = 0
- H2a: At least one of βReasonable, Cash payment, Credit card payment ≠ 0

- H3o: βAvailability in business area, Availability in residential area, Availability of taxi number =0
- H3a: At least one of β Availability in business area, Availability in residential area, Availability of taxi number ≠ 0

- H4o: βDiscount, Special Offers, Advertising = 0
- H4a: At least one of βDiscount, Special Offers, Advertising ≠ 0

- H5o: βCar condition, Car type, Cleanliness = 0
- H5a: At least one of β Car condition, Car type, Cleanliness ≠ 0

- H6o: βOnline booking, Service during the trip, Giving feedback = 0
- H6a: At least one of βOnline booking, Service during the trip, Giving feedback ≠0

- H7o: β Friendliness and Politeness, Knowledge and skill, Trust and credibility = 0
- H7a: At least one of β Friendliness and Politeness, Knowledge and skill, Trust and credibility ≠ 0

- H8a: β Simplicity, Clear, user-friendly navigation, Good use of color, Well-formatted content, Speed/ Fast load time, Professional web/app design = 0
- H8o: At least one of β Simplicity, Clear, user-friendly navigation, Good use of color, Well-formatted content, Speed/ Fast load time, Professional web/app design ≠ 0
- H9o: β Brand Awareness , Brand Loyalty, Brand Reputation = 0
- H9a: At least one of β Brand Awareness , Brand Loyalty, Brand Reputation ≠0

- H10o: βEconomic situation , Lifestyles, Influential people, Social network, Social trend = 0
- H10a: At least one of βEconomic situation , Lifestyles, Influential people, Social network, Social trend ≠ 0

CHAPTER 3

METHODOLOGY

In this chapter, the researcher explained research strategy and approaches used in this independent study. The author also provides detail about population and samples, variables, survey instruments, reliability and validity assessment, data collection, and statistic for data analysis

3.1 Research Strategy

This research is a quantitative research, the researcher uses questionnaire as a tool for data collecting process. According to Given, Lisa M. (2008), quantitative research is the systematic empirical investigation of observable phenomena via statistical, mathematical or computational techniques in natural sciences and social sciences. The main purpose of the study is to examine and identify the main factor influencing consumer brand choices of top 3 taxi booking mobile applications in Bangkok: Uber, Grabtaxi and Easy Taxi.

3.2 Populations and Samples

Populations

Target group of this study is identified as the taxi passengers in Bangkok who have used these 3 taxi apps: Uber, GrabTaxi, and Easy Taxi.

Samples

A sample from this study is user of Uber, GrabTaxi, and Easy Taxi in Bangkok. The researcher aims to collect 400 samples of taxi app's user in Bangkok.

3.3 Variables and Hypothesis

In this study, the researcher presents variables accordingly to the proposed variable and hypothesis as follow;

Dependent variable:

Consumer brand choice of top 3 taxi booking mobile applications in Bangkok

Independent variables:

H1. Service

H2. Price

H3. Place

H4. Promotion

H5. Car condition

H6. Physical environment

H7. Driver

H8. Mobile Application

H9. Brand Name

H10. Consumer Behavior

Hypothesis:

- H1o: βService, Security, Convenience = 0
- H1a: At least one of βService, Security, Convenience ≠ 0

- H2o: βReasonable, Cash payment, Credit card payment = 0
- H2a: At least one of βReasonable, Cash payment, Credit card payment ≠ 0

- H3o: βAvailability in business area, Availability in residential area, Availability of taxi number =0
- H3a: At least one of β Availability in business area, Availability in residential area, Availability of taxi number ≠ 0

- H4o: βDiscount, Special Offers, Advertising = 0
- H4a: At least one of βDiscount, Special Offers, Advertising ≠ 0

- H5o: βCar condition, Car type, Cleanliness = 0
- H5a: At least one of β Car condition, Car type, Cleanliness ≠ 0

- H6o: βOnline booking, Service during the trip, Giving feedback = 0
- H6a: At least one of βOnline booking, Service during the trip, Giving feedback ≠0

- H7o: β Friendliness and Politeness, Knowledge and skill, Trust and credibility = 0
- H7a: At least one of β Friendliness and Politeness, Knowledge and skill, Trust and credibility ≠ 0

- H8a: β Simplicity, Clear, user-friendly navigation, Good use of color, Well-formatted content, Speed/ Fast load time, Professional web/app design = 0
- H8o: At least one of βSimplicity, Clear, user-friendly navigation, Good use of color, Well-formatted content, Speed/ Fast load time, Professional web/app design ≠ 0

- H9o: β Brand Awareness , Brand Loyalty, Brand Reputation = 0
- H9a: At least one of β Brand Awareness , Brand Loyalty, Brand Reputation ≠0

- H10o: β Economic situation , Lifestyles, Influential people, Social network, Social trend = 0
- H10a: At least one of β Economic situation , Lifestyles, Influential people, Social network, Social trend ≠ 0

3.4 Survey Instruments

The researcher uses questionnaire which designed in line with the objectives of the study as an instrument to collect data in order to examine and identify the factors influencing consumer brand choices among 3 taxi booking applications: Uber, GrabTaxi and Easy Taxi. The questions will be kept short and clear as possible as it can be.

The questionnaire is divided into 4 parts.

- The first part consists of general information.
- The second part requires the information of marketing factors influencing consumer brand choices.
- The Third part deals with consumer behavior influencing consumer brand choices.
- The last part is demographic of the respondent which information collected includes gender, age, career, income level, lifestyle, etc.

In part 1, there are 2 questions. First question requires the attendant to choose the most used taxi application among Uber, GrabTaxi and Easy Taxi. The second question requires attendant to rank the level of importance of the factors influencing brand choices which are taxi service, price, place, promotion, car condition, process, driver, mobile application, brand name and consumer behavior.

Table 3.1 : Level of Information Measurement and Criteria.

Question No.	Level of Measurement	Criteria Classification
1	Nominal	1 = Uber
		2 = GrabTaxi
		3 = Easy Taxi
2	Scale	0 = No effect
		1 = Not at all important
		2 = Low important
		3 = Slightly important
		4 = Neutral
		5 = Moderately important
		6 = Very important
		7 = Extremely important

The scale to measure part 1 which is general information has divided into 8 points scale as specified in the table above. For the measurement analysis, the interval for breaking the range in measuring each variable can be calculated as follow;

$$\text{Interval class} = \frac{\text{Range (Max value} - \text{Min value)}}{Number\ of\ interval}$$

$$\text{Interval class} = \frac{8-1}{8} \approx 0.9$$

It means, approximately scores fall between the rages of:

6.3- 7 are considered as extremely important

5.4- 6.2 are considered as very important

4.5 -5.3 are considered as moderately important

3.6 – 4.4 are considered as neutral

2.7 – 3.5 are considered as slightly important

1.8 – 2.6 are considered as low important

0.9 – 1.7 are considered as not at all important

0.0 -0.8 are considered as no effect

In part 2, it is about marketing factors influencing consumer brand choices which categorized into 4 issues: Q3. marketing mix (7Ps), Q4. mobile application factor, Q5. brand name and Q6. consumer behavior. The scale to measure is divided into 5 points scale as shown in the table next page;

Table 3.2: Level of Information Measurement and Criteria.

Question no.	Level of Measurement	Criteria Classification
3-6	Scale	1 = Not at all important
		2 = Slightly important
		3 = Neutral
		4 = Important
		5 = Very important

For the measurement analysis, the interval of part 2 can be calculated as follow;

$$\text{Interval class} = \frac{5-1}{5} \approx 0.8$$

It means, approximately scores fall between the rages of:

4.21 – 5.00 are considered as very important

3.41 – 4.20 are considered as important

2.61 – 3.40 are considered as neutral

1.81 – 2.60 are considered as slightly important

1.00 – 1.80 are considered as not at all important

In part 3, attendants are asked to answer the question about consumer behavior influencing consumer brand choices, such as economic situation, influential people, social network, etc. There are 8 questions in this part regarding to the variables below;

Table 3.3: Level of Information Measurement and Criteria.

Question no.	Variable	Level of Measurement	Criteria Classification
7	Economic situation affects decision	Nominal	1 = Yes 2 = No

(Continued)

Table 3.3 (Continued): Level of Information Measurement and Criteria.

Question no.	Variable	Level of Measurement	Criteria Classification
8	Economic situation	Ordinal	1 = Excellence 2 = Very good 3 = Good 4 = Fair 5 = Poor 6 = Others
9	Frequency	Ordinal	1 = 3 times or less per week 2 = 5 times or less per week 3 = Every day
10	Influential people	Nominal	1 = Family 2 = Friends 3 = Advertising 4 = Social network 5 = Myself 6 = Others

(Continued)

Table 3.3 (Continued): Level of Information Measurement and Criteria.

Question no.	Variable	Level of Measurement	Criteria Classification
11	Social network	Nominal	1 = Facebook 2 = Twitter 3 = Instagram 4 = LinkedIn 5 = Tumblr 6 = Google+ 7 = Youtube 8 = Others
12	Social network chosen in Q12 affects decision	Nominal	1 = Yes 2 = No 3 = Others, please specific
13	Social trend affects decision	Nominal	1 = Yes 2 = No
14	Repeat customer and recommend to others	Ordinal	1 = Definitely will 2 = Probably will 3 = Definitely won't 4 = Probably won't

And the last part, the attendants are required to give personal information as below table.

Table 3.4: Level of Information Measurement and Criteria.

Question no.	Variable	Level of Measurement	Criteria Classification
15	Profession	Nominal	1 = Accountant 2 = Photographer 3 = Officer 4 = Analyzer 5 = Customer service 6 = Business owner 7 = Teacher 8 = Employee 9 = Engineer 10 = Student 11 = Sales person 12 = Freelancer 13 = Retailer 14 = Others

(Continued)

Table 3.4 (Continued): Level of Information Measurement and Criteria.

Question no.	Variable	Level of Measurement	Criteria Classification
16	Gender	Nominal	1 = Male 2 = Female
17	Age	Ordinal	1 = 20 and under 2 = 21-30 3 = 31-40 4 = 41-50 5 = 51-60 6 = 61 and over
18	Race	Nominal	1 = White 2 = Asian 3 = Hispanic or Latino 4 = Black 5 = Others

(Continued)

Table 3.4 (Continued): Level of Information Measurement and Criteria.

Question no.	Variable	Level of Measurement	Criteria Classification
19	Level of education	Ordinal	1 = High school or less 2 = High school or equivalent 3 = Vocational/technical school 4 = Some college 5 = Bachelor's degree 6 = Master's degree 7 = Professional degree 8 = Doctoral degree 9 = Others
20	Employment status	Nominal	1 = Full time employment 2 = Part time employment 3 = Self-employed 4 = Unemployed 5 = A student 6 = Retired 7 = Others

(Continued)

Table 3.4 (Continued): Level of Information Measurement and Criteria.

Question no.	Variable	Level of Measurement	Criteria Classification
21	Income per month	Ordinal	1 = ฿15,000 and less 2 = ฿15,001 – ฿25,000 3 = ฿25,001 – ฿35,000 4 = ฿35,001 – ฿45,000 5 = ฿45,001 – ฿55,000 6 = ฿55,001 and more

3.5 Validity and Reliability Assessment

The questionnaire examines to two important aspects, which are content validity and reliability in order to ensure that the respondents have a same common understanding of questionnaire. After that they can answer based on fact, feeling and experience as statistical reliability of the questionnaire.

3.5.1 Content Validity

Every questions exist on questionnaires are from conceptual framework. The researcher submitted this questionnaire to an independent study advisor and

three qualified experts who have experience in related field in order to ensure content validity.

To prove the consistency of questions, the researcher uses Index of Item Objective Congruence (IOC) method to calculate the consistency between questions and objective as below:

$$IOC = \frac{\Sigma R}{N}$$

IOC = consistency between the objective and content or questions and objective.

ΣR = total assessment points given from all qualified experts.

N = number of qualified experts.

The consistency index value will be accepted at the value of 0.5 or above.

$$IOC = \frac{\Sigma R}{N}$$

After receiving assessment result, the questions have been chosen and adapt to make sure that each question has the consistency index value more than 0.5. The assessment result of this questionnaire has the total consistency index value equal to 0.978 with one question that has IOC index less than 0.5.

3.5.2 Reliability

The researcher launches 30 sets of online questionnaire to attendants as a pilot test to examine the reliability of the questionnaire. The reliability test is processed on IBM SPSS Statistics software by using Cronbach's alpha coefficient.

Table 3.5: Criteria of Reliability

Cronbach's Alpha Coefficient	Reliability Level	Desirability Level
0.80 – 1.00	Very High	Excellent
0.70 – 0.79	High	Good
0.50 – 0.69	Medium	Fair
0.30 – 0.49	Low	Poor
Less than 0.30	Very Low	Unacceptable

Source: Vanitbuncha, K. (2003). *Statistical analysis: Statistics for management and research.* Thailand: Department of Statistic Faculty of Chulalongkon University.

If Cronbach's alpha coefficient is more than 0.70, the questionnaire reliability is acceptable (Cronbach, 1951; Olorunniwo et al., 2006). The criteria of reliability are illustrated in table 3.5.

The value of Cronbach's alpha coefficient of the 30 pre-test questionnaires is 0.976 with n of items = 45. As the result shown in table 3.6, the value of Cronbach's

alpha for general information, marketing mix (7Ps), mobile application, brand name and consumer behavior are 0.975, 0.964, 0.885, 0.853 and 0.830 respectively.

According to Olorunniwo et al. (2006) the acceptable value of alpha should be about 0.70. The overall Cronbach's alpha coefficient value from this questionnaire is all higher than the value of 0.70; therefore, the quality and accuracy of questionnaire is high in reliability level and the desirability level is excellent (Cronbach, 1951; Olorunniwo et al., 2006). As a result, all 45 items within 6 constructs are acceptable in this study based on the result of alpha value.

Table 3.6: The Result of Cronbach's Alpha Test with 30 Try-out Questionnaires.

Variables	Cronbach's Alpha	Number of Items
All parts	.976	45
General information	.975	10
Marketing Mix (7Ps)	.964	21
Mobile application	.885	6
Brand	.853	3
Consumer behavior	.830	5

3.6 Data Collection

In this study, the data used within this study is categorized into 2 types. First data is the primary data which has been collected from questionnaires. Second data is the secondary data which is information from articles, journal, research, and the internet that researcher has analyzed and studied.

Data collection has been done during October, 2015 to January, 2016 by distributing the questionnaires to sample group who use taxi booking mobile application in Bangkok via social media. The researcher divided the questionnaire into four parts, which are general information, impact of marketing factors, impact of consumer behavior and demographic.

3.7 Statistic for Data Analysis

Data analyzing process for this research is processed on a computer program and presented on a format of table of content along with description on each table. As for the statistic for data analysis, the researcher use;

1. **Multinomial Logistic Regression** method to analyze the relationship between marketing mix, mobile application, brand, consumer behavior and consumer brand choice

Anass Bayaga (2010) stated that the multinomial or polytomous logistic regression model is a simple extension of the binomial logistic regression model. It is used when the dependent variable has more than two nominal or unordered categories.

Why using multinomial logistic regression?

According to Greene (2012), in statistics, multinomial logistic regression is a classification method that generalizes logistic regression to multiclass problems, i.e. with more than two possible discrete outcomes. It is a model that is used to predict the

probabilities of the different possible outcomes of a categorically distributed dependent variable, given a set of independent variables (which may be real-valued, binary-valued, categorical-valued, etc.).

Multinomial logistic regression is applied to this research because the dependent variable in question is nominal or equivalently categorical, meaning that it falls into any one of a set of categories which cannot be ordered in any meaningful way and for which there are more than two categories.

2. **Factor analysis** method to analyze the relationship between all factors and consumer brand choice

Factor analysis is the data reduction tool that eliminates redundancy from a set of correlated variables. It represents correlated variables with a smaller set of "derived" variables.

Factors are formed that are relatively independent of one another. (Elizabeth, 2006) There are two types of variables:

- latent variables: factors

  - A variable that is not observable or is not directly measurable.

  - A variable that is measured with error or can only be measured with error.

- A latent variable can be used to represent a ‘true’ variable which is measured with error, or a single conceptual variable, or a construct which is a summarization of a complex concept. (Wall, 2006)

- observed variables

  The observed variable is the measurement that is directly observed, and some degree of random measurement error may exist such that the observed score does not perfectly match the true scores. (Newsom, 2015)

Why using factor analysis?

Factor analysis is a technique that requires a large sample size. It is based on the correlation matrix of the variables involved, and correlations usually need a large sample size before they stabilize.

The researcher uses factor analysis method because is a method of data reduction by seeking underlying unobservable variables (latent variable) that are reflected in the observed variables (manifest variables). (Institute for Digital Research and Education, n.d.)The researcher focuses on figuring out the latent variables that drive brand choice decision which is unobservable.

3. **Descriptive Statistics Analysis** by using crosstabs to see frequency and percentage to explain consumer behavior and demographic data

Descriptive statistics can be used to summarize the data which is categorical by using the crosstabs procedures. To summarize the relationship between two categorical variables, the researcher uses a cross-tabulation (also called a contingency table). A cross-tabulation (or crosstab for short) is a table that depicts the number of times each of the possible category combinations occurred in the sample data.

CHAPTER 4

RESEARCH FINDINGS AND DATA ANALYSIS

In this chapter, the researcher is presenting complete result and analysis of this study. The results received from 400 questionnaires (online surveys) which are conducted by conceptual framework and methodology in the previous chapter. The results of consumer behavior influencing consumer brand choices of top 3 taxi booking mobile applications in Bangkok: Uber, GrabTaxi and Easy Taxi will be separate within three parts:

4.1 The analysis of multinomial logistic regression method to explain the significant of general information (7 Likert scale)

4.2 The factor analysis of marketing mix (7Ps), mobile application, brand and consumer behavior. (5 Likert scale)

4.3 The analysis of consumer behavior and demographic (Multiple choice)

4.1 The analysis of multinomial logistic regression method to explain the significant of general information (7 Likert scale)

In this part, the researcher will apply multinomial logistic regression to analyze data.

As mentioned in chapter 3, in statistics, multinomial logistic regression is a classification method that generalizes logistic regression to multiclass problems, i.e. with more than two possible discrete outcomes. It is a model that is used to predict the probabilities of the different possible outcomes of a categorically distributed

dependent variable, given a set of independent variables (which may be real-valued, binary-valued, categorical-valued, etc.).

Multinomial logistic regression is applied to this research because the dependent variable in question is nominal or equivalently categorical, meaning that it falls into any one of a set of categories which cannot be ordered in any meaningful way and for which there are more than two categories.

Table 4.1: Hypothesis test: Model Fitting Information

Model	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood	Chi-Square	df	Sig.
Null	846.796			
Final	10.962	835.834	98	.000

Table 4.2: Hypothesis test: Likelihood Ratio Tests

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
product	281.363[a]	270.402	14	.000
price	247.908[a]	236.946	14	.000

(Continued)

Table 4.2 (Continued) : Hypothesis test: Likelihood Ratio Tests

Effect	Model Fitting Criteria	Likelihood Ratio Tests		
	-2 Log Likelihood of Reduced Model	Chi-Square	df	Sig.
promotion	22.066[a]	11.105	12	.520
physical evidence	150.213[a]	139.252	14	.000
process	40.979[a]	30.017	14	.008
people	317.511	306.549	12	.000
mobile application	300.552	24.166	14	.044
brand	494.917	218.530	14	.000
consumer behavior	364.615	88.229	14	.000

From table 4.2, there are 10 factors analyzed in this part:

Dependent variable

Consumer brand choice of top 3 taxi booking mobile applications in Bangkok

Independent variable

H1 Service

H2 Price

H3 Place

H4 Promotion

H5 Physical evidence

H6 Process

H7 People

H8 Mobile Application

H9 Brand Name

H10 Consumer Behavior

The result is that the model significantly fit the data very well (p-value<.05) and LRT also shows that most variables significantly impact taxi brand choices (p-value<.05) except promotion and place (availability).

- **Marketing Mix (7Ps)**

According to result, we can reject null hypothesis meaning product or service has significant on consumer brand choice by the result is statistically significant equal 0.000, price has significant on consumer brand choice by the result is statistically significant equal 0.000, physical evidence has significant on consumer brand choice by the result is statistically significant equal 0.000, process has significant on consumer brand choice by the result is statistically significant equal 0.008, people has significant on consumer brand choice by the result is statistically significant equal 0.000. Most components have enough evidence to reject with mean score on the standard test at 0.05 significance level.

Since P-value of βService < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H1o: βService, Security, Convenience = 0
- H1a: At least one of βService, Security, Convenience ≠ 0

Since P-value of βPrice < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H2o: βReasonable, Cash payment, Credit card payment = 0
- H2a: At least one of βReasonable, Cash payment, Credit card payment ≠ 0

Since P-value of βPlace > .05; therefore, we cannot reject null hypothesis and cannot conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H3o: βAvailability in business area, Availability in residential area, Availability of taxi number =0
- H3a: At least one of β Availability in business area, Availability in residential area, Availability of taxi number ≠ 0

Since P-value of βPromotion > .05; therefore, we cannot reject null hypothesis and cannot conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H4o: βDiscount, Special Offers, Advertising = 0
- H4a: At least one of βDiscount, Special Offers, Advertising ≠ 0

Since P-value of βPhysical evidence < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H5o: βCar condition, Car type, Cleanliness = 0
- H5a: At least one of β Car condition, Car type, Cleanliness ≠ 0

Since P-value of βProcess < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H6o: βOnline booking, Service during the trip, Giving feedback = 0
- H6a: At least one of β Online booking, Service during the trip, Giving feedback ≠ 0

Since P-value of βPeople < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H7o: β Friendliness and Politeness, Knowledge and skill, Trust and credibility = 0
- H7a: At least one of β Friendliness and Politeness, Knowledge and skill, Trust and credibility ≠ 0

- **Mobile application**

According to result, we can reject null hypothesis meaning mobile application has significant on consumer brand choice by the result is statistically significant equal 0.044. Therefore it has enough evidence to reject with mean score on the standard test at 0.05 significance level.

Since P-value of βMobile Application < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H8a: β Simplicity, Clear, user-friendly navigation, Good use of color, Well-formatted content, Speed/ Fast load time, Professional web/app design = 0
- H8o: At least one of β Simplicity, Clear, user-friendly navigation, Good use of color, Well-formatted content, Speed/ Fast load time, Professional web/app design ≠ 0

- **Brand**

According to result, we can reject null hypothesis meaning brand has significant on consumer brand choice by the result is statistically significant equal 0.000. Therefore it has enough evidence to reject with mean score on the standard test at 0.05 significance level.

Since P-value of βBrand < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H9o: β Brand Awareness , Brand Loyalty, Brand Reputation = 0
- H9a: At least one of β Brand Awareness , Brand Loyalty, Brand Reputation ≠ 0

- **Consumer behavior**

According to result, we can reject null hypothesis meaning consumer behavior has significant on consumer brand choice by the result is statistically significant equal 0.000. Therefore it has enough evidence to reject with mean score on the standard test at 0.05 significance level.

Since P-value of βConsumer Behavior < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H10o: β Economic situation , Lifestyles, Influential people, Social network, Social trend = 0
- H10a: At least one of β Economic situation , Lifestyles, Influential people, Social network, Social trend ≠ 0

Comparison of Uber over Easy Taxi (The reference category is Easy Taxi)

Table 4.3: Parameter Estimates (Comparison of Uber over Easy Taxi)

BRAND[a]		B	Std. Error	Wald	df	Sig.	Exp(B)	95% Confidence Interval for Exp(B)	
								Lower Bound	Upper Bound
Uber	[A201=0]	4.417	1.377	10.296	1	.001	82.845	5.579	1230.228
	[A201=1]	3.281	1.420	5.338	1	.021	26.602	1.645	430.276
	[A201=2]	1.996	1.451	1.892	1	.169	7.361	.428	126.506
	[A201=3]	3.130	1.314	5.672	1	.017	22.877	1.740	300.729

(Continued)

Table 4.3(Continued): Parameter Estimates (Comparison of Uber over Easy Taxi)

[A201=4]	.222	1.391	.026	1	.873	1.249	.082	19.086
[A201=5]	2.733	1.314	4.326	1	.038	15.377	1.171	201.975
[A201=6]	-1.929	1.596	1.460	1	.227	.145	.006	3.319
[A201=7]	2.515	1.497	2.821	1	.093	12.362	.657	232.475
[A202=0]	-.973	9113.474	.000	1	1.000	.378	.000	.[b]
[A202=1]	-3.944	1.459	7.310	1	.007	.019	.001	.338
[A202=2]	-4.835	1.505	10.319	1	.001	.008	.000	.152
[A202=3]	-3.539	1.427	6.151	1	.013	.029	.002	.476
[A202=4]	-.074	1.144	.004	1	.949	.929	.099	8.743
[A202=5]	.298	.957	.097	1	.756	1.347	.206	8.795
[A202=6]	1.187	.982	1.460	1	.227	3.277	.478	22.474
[A202=7]	0[c]	.	.	0	.	.	.	.
[A203=0]	.172	.000	.	1	.	1.188	1.188	1.188
[A203=1]	-16.008	2312.594	.000	1	.994	1.116E-7	.000	.[b]
[A203=2]	3.551	1.648	4.641	1	.031	34.853	1.378	881.782
[A203=3]	2.003	1.611	1.545	1	.214	7.408	.315	174.286
[A203=4]	-1.437	1.219	1.389	1	.239	.238	.022	2.593
[A203=5]	1.273	1.081	1.388	1	.239	3.572	.430	29.704
[A203=6]	1.891	1.066	3.147	1	.076	6.629	.820	53.584
[A203=7]	0[c]	.	.	0	.	.	.	.
[A204=0]	-3.616	.000	.	1	.	.027	.027	.027
[A204=1]	16.566	2312.594	.000	1	.994	1564301 1.575	.000	.[b]
[A204=2]	-1.955	1.513	1.671	1	.196	.141	.007	2.744
[A204=3]	-3.172	1.409	5.068	1	.024	.042	.003	.663

(Continued)

Table 4.3(Continued): Parameter Estimates (Comparison of Uber over Easy Taxi)

[A204=4]	-1.807	1.388	1.694	1	.193	.164	.011	2.494
[A204=5]	-3.430	1.331	6.641	1	.010	.032	.002	.440
[A204=6]	-2.073	1.258	2.718	1	.099	.126	.011	1.479
[A204=7]	0[c]	.	.	0	.	.	.	.
[A205=0]	-2.049	1.553	1.741	1	.187	.129	.006	2.704
[A205=1]	1.479	1.108	1.780	1	.182	4.387	.500	38.518
[A205=2]	-1.183	1.186	.995	1	.319	.306	.030	3.131
[A205=3]	-1.686	1.148	2.159	1	.142	.185	.020	1.756
[A205=4]	1.639	.730	5.045	1	.025	5.152	1.232	21.537
[A205=5]	2.319	.877	6.986	1	.008	10.166	1.821	56.758
[A205=6]	1.326	.777	2.912	1	.088	3.767	.821	17.283
[A205=7]	2.427	1.235	3.862	1	.049	11.325	1.006	127.436
[A206=0]	19.004	3611.549	.000	1	.996	1792550 30.553	.000	.[b]
[A206=1]	-1.645	1.790	.844	1	.358	.193	.006	6.449
[A206=2]	-.941	1.403	.450	1	.502	.390	.025	6.106
[A206=3]	-.956	1.333	.514	1	.473	.385	.028	5.244
[A206=4]	-.823	1.027	.642	1	.423	.439	.059	3.289
[A206=5]	-1.657	.967	2.938	1	.086	.191	.029	1.268
[A206=6]	-2.267	.826	7.531	1	.006	.104	.021	.523
[A206=7]	0[c]	.	.	0	.	.	.	.
[A207=0]	-16.980	5029.965	.000	1	.997	4.222E-8	.000	.[b]
[A207=1]	-16.325	1347.230	.000	1	.990	8.130E-8	.000	.[b]
[A207=2]	1.497	1.708	.768	1	.381	4.467	.157	127.111
[A207=3]	2.377	1.581	2.259	1	.133	10.771	.485	239.011
[A207=4]	-16.470	1266.734	.000	1	.990	7.034E-8	.000	.[b]

(Continued)

Table 4.3 (Continued): Parameter Estimates (Comparison of Uber over Easy Taxi)

[A207=5]	.144	.750	.037	1	.848	1.155	.266	5.018
[A207=6]	1.097	.670	2.681	1	.102	2.994	.806	11.129
[A207=7]	0[c]	.	.	0	.	.	.	.
[A208=0]	5.002	8451.527	.000	1	1.000	148.659	.000	.[b]
[A208=1]	3.817	1.928	3.919	1	.048	45.447	1.039	1988.433
[A208=2]	5.584	1.789	9.736	1	.002	266.078	7.976	8876.098
[A208=3]	4.589	1.654	7.696	1	.006	98.383	3.845	2517.244
[A208=4]	6.239	1.910	10.670	1	.001	512.418	12.127	21651.168
[A208=5]	4.379	1.754	6.231	1	.013	79.796	2.562	2485.281
[A208=6]	5.851	1.708	11.741	1	.001	347.539	12.234	9872.678
[A208=7]	4.842	1.612	9.020	1	.003	126.747	5.377	2987.637
[A209=0]	-69.572	.000	.	1	.	6.100E-31	6.100E-31	6.100E-31
[A209=1]	-54.938	3465.574	.000	1	.987	1.383E-24	.000	.[b]
[A209=2]	-34.539	2025.795	.000	1	.986	9.993E-16	.000	.[b]
[A209=3]	-16.513	3368.299	.000	1	.996	6.738E-8	.000	.[b]
[A209=4]	-2.038	1.310	2.422	1	.120	.130	.010	1.697
[A209=5]	-1.922	1.174	2.680	1	.102	.146	.015	1.461
[A209=6]	-47.782	2757.822	.000	1	.986	1.773E-21	.000	.[b]
[A209=7]	0[c]	.	.	0	.	.	.	.
[A2010=0]	14.785	1502.830	.000	1	.992	2637680.100	.000	.[b]

(Continued)

Table 4.3 (Continued): Parameter Estimates (Comparison of Uber over Easy Taxi)

[A2010=1]	48.865	3465.574	.000	1	.989	1666607 3773425 8980000 0.000	.000	.[b]
[A2010=2]	30.817	2025.796	.000	1	.988	2420138 4617169 .516	.000	.[b]
[A2010=3]	29.087	2025.795	.000	1	.989	4290576 826478. 334	.000	.[b]
[A2010=4]	-2.023	1.478	1.874	1	.171	.132	.007	2.396
[A2010=5]	-3.451	1.397	6.103	1	.013	.032	.002	.490
[A2010=6]	-2.355	1.566	2.260	1	.133	.095	.004	2.045
[A2010=7]	0[c]	.	.	0	.	.	.	.

From the result, the significant factors influencing choosing Uber over Easy Taxi include 6 variables. For service, P-value of βService is less than .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H1o: βService, Security, Convenience = 0
- H1a: At least one of βService, Security, Convenience ≠ 0

And the below variables are also get the same result;

- H4. promotion
- H5. physical evidence
- H6. process
- H8. mobile application

- H10. consumer behavior

Comparison of GrabTaxi and Easy Taxi (The reference category is Easy Taxi)

Table 4.4: Parameter Estimates of Comparison of GrabTaxi over Easy Taxi (Same as table 4.3 given)

GrabTaxi	[A201=0]	5.167	1.338	14.907	1	.000	175.458	12.733	2417.753
	[A201=1]	4.626	1.374	11.332	1	.001	102.065	6.907	1508.319
	[A201=2]	4.090	1.372	8.886	1	.003	59.732	4.058	879.178
	[A201=3]	3.614	1.266	8.152	1	.004	37.106	3.105	443.437
	[A201=4]	2.214	1.252	3.130	1	.077	9.154	.787	106.419
	[A201=5]	3.529	1.262	7.823	1	.005	34.083	2.875	404.078
	[A201=6]	2.176	1.198	3.299	1	.069	8.812	.842	92.231
	[A201=7]	3.089	1.465	4.444	1	.035	21.945	1.242	387.617
	[A202=0]	19.527	6690.398	.000	1	.998	3023586 73.541	.000	.[b]
	[A202=1]	-3.375	1.383	5.958	1	.015	.034	.002	.514
	[A202=2]	-4.326	1.477	8.575	1	.003	.013	.001	.239
	[A202=3]	-1.441	1.206	1.428	1	.232	.237	.022	2.515
	[A202=4]	1.075	1.002	1.151	1	.283	2.930	.411	20.881
	[A202=5]	.908	.901	1.016	1	.313	2.480	.424	14.493
	[A202=6]	.877	.910	.929	1	.335	2.403	.404	14.301
	[A202=7]	0[c]	.	.	0	.	.	.	.
	[A203=0]	31.634	.000	.	1	.	5476049 1805097 .550	547604 918050 97.550	54760491 805097.55 0

(Continued)

Table 4.4 (Continued) : Parameter Estimates of Comparison of GrabTaxi over Easy Taxi (Same as table 4.3 given)

[A203=1]	16.234	2576.785	.000	1	.995	1122792 3.418	.000	.[b]
[A203=2]	-.420	1.482	.080	1	.777	.657	.036	11.988
[A203=3]	1.098	1.411	.606	1	.436	2.999	.189	47.629
[A203=4]	-.654	1.034	.400	1	.527	.520	.069	3.943
[A203=5]	1.027	.989	1.077	1	.299	2.792	.402	19.413
[A203=6]	1.895	.991	3.661	1	.056	6.656	.955	46.394
[A203=7]	0[c]	.	.	0	.	.	.	.
[A204=0]	-37.177	8991.284	.000	1	.997	7.147E-17	.000	.[b]
[A204=1]	-17.978	2576.785	.000	1	.994	1.557E-8	.000	.[b]
[A204=2]	-3.994	1.479	7.288	1	.007	.018	.001	.335
[A204=3]	-2.304	1.274	3.270	1	.071	.100	.008	1.213
[A204=4]	-2.596	1.222	4.511	1	.034	.075	.007	.818
[A204=5]	-5.016	1.261	15.820	1	.000	.007	.001	.079
[A204=6]	-2.241	1.191	3.539	1	.060	.106	.010	1.098
[A204=7]	0[c]	.	.	0	.	.	.	.
[A205=0]	.791	1.002	.624	1	.430	2.206	.310	15.706
[A205=1]	-14.610	864.336	.000	1	.987	4.518E-7	.000	.[b]
[A205=2]	-32.308	1288.081	.001	1	.980	9.309E-15	.000	.[b]
[A205=3]	1.399	.821	2.903	1	.088	4.050	.810	20.237
[A205=4]	1.517	.696	4.757	1	.029	4.560	1.166	17.825
[A205=5]	2.391	.842	8.063	1	.005	10.921	2.097	56.874
[A205=6]	1.094	.738	2.200	1	.138	2.987	.704	12.681
[A205=7]	4.436	1.145	14.999	1	.000	84.399	8.942	796.564

(Continued)

Table 4.4 (Continued) : Parameter Estimates of Comparison of GrabTaxi over Easy Taxi (Same as table 4.3 given)

[A206=0]	31.211	6414.208	.000	1	.996	3587539 5092345 .170	.000	.[b]
[A206=1]	-31.587	2053.616	.000	1	.988	1.914E- 14	.000	.[b]
[A206=2]	-.539	1.172	.212	1	.645	.583	.059	5.803
[A206=3]	.511	1.160	.194	1	.659	1.667	.172	16.192
[A206=4]	-.208	.906	.053	1	.819	.812	.138	4.796
[A206=5]	-1.345	.912	2.174	1	.140	.261	.044	1.557
[A206=6]	-1.168	.778	2.252	1	.133	.311	.068	1.430
[A206=7]	0[c]	.	.	0	.	.	.	.
[A207=0]	-12.777	.000	.	1	.	2.825E-6	2.825E- 6	2.825E-6
[A207=1]	45.504	2226.220	.000	1	.984	5783595 0694748 700000. 000	.000	.[b]
[A207=2]	31.368	1288.081	.001	1	.981	4196157 5289989 .290	.000	.[b]
[A207=3]	-1.371	1.281	1.145	1	.285	.254	.021	3.126
[A207=4]	.387	.978	.157	1	.692	1.473	.217	10.018
[A207=5]	.749	.645	1.347	1	.246	2.114	.597	7.488
[A207=6]	.353	.614	.331	1	.565	1.424	.427	4.746
[A207=7]	0[c]	.	.	0	.	.	.	.
[A208=0]	20.111	2922.834	.000	1	.995	5422404 92.690	.000	.[b]

(Continued)

Table 4.4 (Continued) : Parameter Estimates of Comparison of GrabTaxi over Easy Taxi (Same as table 4.3 given)

[A208=1]	5.647	1.890	8.925	1	.003	283.380	6.974	11515.158
[A208=2]	4.693	1.771	7.024	1	.008	109.141	3.395	3508.646
[A208=3]	5.417	1.570	11.900	1	.001	225.298	10.376	4892.209
[A208=4]	6.874	1.839	13.975	1	.000	967.087	26.315	35541.181
[A208=5]	6.245	1.645	14.412	1	.000	515.602	20.511	12961.356
[A208=6]	6.688	1.684	15.764	1	.000	802.807	29.565	21799.418
[A208=7]	5.525	1.599	11.937	1	.001	250.945	10.922	5765.508
[A209=0]	-19.401	2922.833	.000	1	.995	3.751E-9	.000	.[b]
[A209=1]	-22.598	2922.833	.000	1	.994	1.534E-10	.000	.[b]
[A209=2]	-3.964	1.283	9.544	1	.002	.019	.002	.235
[A209=3]	17.223	2691.021	.000	1	.995	30183574.767	.000	.[b]
[A209=4]	-1.896	1.269	2.235	1	.135	.150	.012	1.804
[A209=5]	-1.530	1.151	1.767	1	.184	.217	.023	2.067
[A209=6]	.273	1.229	.049	1	.824	1.315	.118	14.627
[A209=7]	0[c]	.	.	0	.	.	.	.
[A2010=0]	-2.115	1.526	1.920	1	.166	.121	.006	2.403
[A2010=1]	15.159	2922.833	.000	1	.996	3833337.211	.000	.[b]
[A2010=2]	1.105	1.779	.386	1	.534	3.019	.092	98.618
[A2010=3]	-3.271	1.300	6.328	1	.012	.038	.003	.486
[A2010=4]	-3.113	1.400	4.947	1	.026	.044	.003	.691
[A2010=5]	-3.957	1.317	9.022	1	.003	.019	.001	.253
[A2010=6]	-4.870	1.459	11.137	1	.001	.008	.000	.134
[A2010=7]	0[c]	.	.	0	.	.	.	.

(Continued)

Significant factors influencing choosing GrabTaxi over Easy Taxi include 5 variables. For service, P-value of βService is also less than .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H1o: βService, Security, Convenience = 0
- H1a: At least one of βService, Security, Convenience ≠ 0

And the below variables are also get the same result;

- H4. promotion
- H5. physical evidence
- H8. mobile application
- H10. consumer behavior

4.2 The factor analysis of marketing mix (7Ps), mobile application, brand and consumer behavior. (5 Likert scale)

As stated in chapter 2, the researcher uses factor analysis method because is a method of data reduction by seeking underlying unobservable variables (latent variable) that are reflected in the observed variables (manifest variables). In machine learning and statistics, factor analysis is the process of reducing the number of random variables under consideration, and can be divided into feature selection and feature extraction. The researcher focuses on figuring out the latent variables that drive brand choice decision which is unobservable.

Varimax, which was developed by Kaiser (1958), is indubitably the most popular rotation method by far. In statistics, a varimax rotation is used to simplify the expression of a particular sub-space in terms of just a few major items each. The actual coordinate system is unchanged; it is the orthogonal basis that is being rotated to align with those coordinates. The sub-space found with principal component analysis or factor analysis is expressed as a dense basis with many non-zero weights which makes it hard to interpret. (Kaiser, 1958) For varimax a simple solution means that each factor has a small number of large loadings and a large number of zero (or small) loadings. This simplifies the interpretation because, after a varimax rotation, each original variable tends to be associated with one (or a small number) of factors, and each factor represents only a small number of variables. In addition, the factors can often be interpreted from the opposition of few variables with positive loadings to few variables with negative loadings. (Herv´e Abdi, 2003)

In this part, there are 35 factors analyzed so the researcher chooses factor analysis: variemax method.

Table 4.5: Factor Analysis: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	18.997	54.277	54.277	18.997	54.277	54.277	8.689	24.826	24.826
2	2.419	6.912	61.189	2.419	6.912	61.189	4.840	13.830	38.656
3	1.910	5.458	66.647	1.910	5.458	66.647	3.981	11.374	50.030
4	1.614	4.610	71.257	1.614	4.610	71.257	3.532	10.092	60.122
5	1.283	3.665	74.922	1.283	3.665	74.922	3.481	9.946	70.068
6	1.002	2.863	77.785	1.002	2.863	77.785	2.701	7.717	77.785

From factor analysis, the researcher can finalize six factors that affect to consumer brand choice of taxi booking mobile application with percent of variance more than 77.79% from all factors that shown in this questionnaire.

From table 4.3: Total Variance Explained, the analysis shows six components

The research has found that from 35 factors include the first components could explain 54.28% of variance before rotation. The second components could explain 6.91% of variance. The third, fourth, fifth and sixth components could explain 5.46%, 4.61%, 3.67%, and 2.87% of variance respectively. These six variables already have explained more than 75% from all 36 variables.

After the rotation is showing, the variables include the first components has variance value equal to 24.83%. The second, third, fourth, fifth and sixth components explained by 13.83%, 11.38%, 10.1%, 9.95% and 7.2% of variance value respectively. Total variables are 77.79% from 36 factors on this questionnaire.

Table 4.6: Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
SERVICE QUALITY	.592	.404	.120	.049	.447	.036
SECURITY	.695	.373	.069	.243	.327	-.038
CONVENIENCE	.672	.406	.172	.171	.086	.092
REASONABLE PRICE	.607	.125	.389	.185	.346	.209
CASH PAYMENT	.490	.322	.361	.180	.016	.346
CREDIT PAYMENT	.711	.292	.224	.060	.188	.292
AVAILABILITY IN BUSINESS AREA	.643	.276	.064	.247	.339	.196

(continued)

Table 4.6 (Continued): Rotated Component Matrix[a]

	Component					
	1	2	3	4	5	6
AVAILABILITY IN RESIDENTIAL AREA	.768	.431	.127	.126	.206	.018
AVAILABILITY OF NUMBER OF TAXI	.462	.647	.201	.168	-.064	.170
DISCOUNT	.279	.437	.592	.275	.022	.196
SPECIAL OFFERS	.137	.222	.849	.208	.090	.079
ADVERTISING	.242	.096	.848	.006	.285	.143
CAR CONDITION	.776	.034	.294	.326	.212	.049
CAR TYPES	.415	-.183	.469	.458	.157	.243
CLEANLINESS	.634	.365	.161	.288	.112	.259
ONLINE BOOKING	.705	.006	.258	.295	.084	.376
SERVICE DURING TRIP	.557	.640	.125	.155	.190	.060
GIVING FEEDBACK	.511	.664	.155	.050	.146	.136
FRIENDLINESS AND POLITENESS	.607	.265	.221	.262	.080	.357
KNOWLEDGE AND SKILL	.575	.390	.064	.091	.087	.354
CLEAR NAVIGATION	.214	.625	.200	.337	.501	.102
GOOD USE OF COLOR	.189	.173	.241	.272	.272	.799
WELL-FORMATTED CONTENT	.312	.286	.125	.782	.220	.209
FAST LOAD TIME	.239	.552	-.024	.392	.154	.399
PROFESSIONAL APP DESIGN	.252	.233	.112	.700	.129	.188
BRAND AWARENESS	.181	.122	.259	.045	.729	.266
BRAND LOYALTY	.309	.040	.239	.320	.635	.248
BRAND REPUTATION	.246	.262	.168	.201	.755	.086
ECONOMIC SITUATION	.242	.096	.848	.006	.285	.143
LIFESTYLES	.776	.034	.294	.326	.212	.049
INFLUENTIAL PEOPLE	.214	.625	.200	.337	.501	.102
SOCIAL NETWORK	.189	.173	.241	.272	.272	.799
SOCIAL TREND	.312	.286	.125	.782	.220	.209

For the result after rotation, the researcher can separate all components into six different groups by rotated component matrix as follow,

Component 1: Marketing and Lifestyles (54.28%)

Marketing and lifestyles components are service quality or process (.59), security (.70), convenience (.67), reasonable price (.61), cash payment (.49), credit payment (.71), availability in business area (.64), availability in residential area (.77), car condition (.78), cleanliness (.63), online booking (.71), friendliness and politeness (.61), knowledge and skill (.58), trust and credibility (.77) and lifestyle (.78).

Component 2: Marketing and Technology (6.91%)

Marketing and technology components are availability of number of taxi (.65), service during trip (.64), giving feedback (.66), simply features (.61), clean navigation (.63), fast load time (.55) and influential people (.63).

Component 3: Marketing and Economic Situation (5.46%)

Marketing and economic situation components are discount (.59), special offers (.85), advertising (.85), car types (.47), and economic situation (.85).

Component 4: Technology and Social media (4.61%)

Technology and social media components are well-formatted content (.78), professional app design (.70), and social trend (.78).

Component 5: Brand (3.67%)

Brand components are brand awareness (.73), brand loyalty (.64), and brand reputation (.76).

Component 6: Template and Contribution (2.86%)

Template and contribution components are good use of app's color (.80) and social network (.80).

4.3 The analysis of consumer behavior and demographic (Multiple choice)

Table 4.7: Economic situation influencing consumer brand choice

		ECONOMIC SITUATION		
		Yes	No	Total
TOP 3 BRAND	Uber	62	38	100
	GrabTaxi	155	58	213
	Easy Taxi	67	20	87
Total		284	116	400

Majority of respondents (71%) answered "yes" which means economic situation influents consumer brand choice among Uber, GrabTaxi and Easy Taxi.

Table 4.8: Economic situation of respondents

		ECONOMIC SITUATION OF USER						Total
		Others	Excellence	Very good	Good	Fair	Poor	
TOP 3 BRAND	Uber	0	12	4	55	25	4	100
	GrabTaxi	1	16	45	87	61	3	213
	Easy Taxi	0	0	8	32	47	0	87
Total		1	28	57	174	133	7	400

Most of respondents (43.5%) described their economic situation as “good”, 33.25% of respondents described as “fair” and 14.25% described as “very good”.

Table 4.9: Frequency of using service

		FREQUENCY			Total
		3 times or less per week	5 times or less per week	Every day	
TOP 3 BRAND	Uber	80	16	4	100
	GrabTaxi	181	16	16	213
	Easy Taxi	76	4	7	87
Total		337	36	27	400

337 respondents (84.25%) use the taxi service via taxi booking mobile app 3 times or less per week. 36 respondents (9%) use 5 times or less per week and 27 respondents (6.75%) use every day.

Table 4.10: Influential people of choosing taxi apps

		INFLUENTIAL PEOPLE					
		Family	Friends	Advertising	Social network	Myself	Total
TOP 3 BRAND	Uber	8	25	4	21	42	100
	GrabTaxi	33	64	17	22	77	213
	Easy Taxi	10	27	0	8	42	87
Total		51	116	21	51	161	400

161 respondents (40.25%) decided to use taxi booking mobile app by themselves. For 116 respondents (29%), friends can influent them to use taxi booking mobile app. Family, social network and advertising is 12.75%, 12.75%, and 5.25% respectively.

Table 4.11: Most used social network of respondents

		MOST USED SOCIAL NETWORK							
		Facebook	Twitter	Instagram	LinkedIn	Tumblr	Google+	Youtube	Total
TOP 3 BRAND	Uber	78	1	4	4	0	4	9	100
	GrabTaxi	185	4	4	8	4	4	4	213
	Easy Taxi	84	0	0	0	0	3	0	87
Total		347	5	8	12	4	11	13	400

Facebook is the most used social network , used by 347 (86.75%) out of 400 respondents. 3.25% of respondents (13 people) use Youtube and 3% of respondents (12 people) use LinkedIn.

Table 4.12: Social network influencing consumer brand choice

		SOCIAL NETWORK			Total
		Yes	No	Others	
TOP 3 BRAND	Uber	67	33	0	100
	GrabTaxi	156	52	5	213
	Easy Taxi	66	21	0	87
Total		289	106	5	400

289 respondents (72.25%) answered “yes” which means their most used social network can affect their consumer brand choice among Uber, GrabTaxi and Easy Taxi. On the other hand, 106 respondents (26.5%) said that their most used social network does not affect their consumer brand choice. 5 respondents (1.25%) said others social network affect their consumer brand choice.

Table 4.13: Repeat customer

		REPEAT CUSTOMER				Total
		Definitely will	Probably will	Definitely won’t	Probably won’t	
TOP 3 BRAND	Uber	41	51	4	4	100
	GrabTaxi	100	101	4	8	213
	Easy Taxi	21	62	4	0	87
Total		162	214	12	12	400

Most of respondents (214 people or 53.5%) probably will use taxi app next time and recommend to other people. 162 respondents (40.5%) definitely will use taxi app next time and recommend to other people. Only 24 respondents (6%) said

"definitely won't" and "probably won't" use taxi app next time and recommend to other people.

Table 4.14: Profession of respondents

		PROFESSION					
		Accountant	Photographer	Analyzer	Customer service	Business owner	Employee
TOP 3 BRAND	Uber	0	8	0	0	16	9
	GrabTaxi	12	12	5	28	24	29
	Easy Taxi	8	0	0	4	0	5
Total		20	20	5	32	40	43

		PROFESSION						
		Office staff	Engineer	Retailer	Student	Sales person	Freelancer	Others
TOP 3 BRAND	Uber	0	12	8	22	9	4	12
	GrabTaxi	30	0	0	41	16	4	12
	Easy Taxi	36	0	0	34	0	0	0
Total		66	12	12	97	25	8	24

Respondents of all questionnaires are students (97 people or 24.25%), office staffs (66 people or 16.5%), employees (43 people or 10.75%), business owner (40 people or 10%), customer service (32 people or 8%) and other profession (126 people or 31.5 %).

Table 4.15: Gender of respondents

		GENDER		
		Male	Female	Total
TOP 3 BRAND	Uber	74	26	100
	GrabTaxi	75	138	213
	Easy Taxi	27	60	87
Total		176	224	400

176 respondents (44%) is male, 224 respondents (56%) is female. Most of male (18.75%) choose Grabtaxi and most of female (34.5%) also choose GrabTaxi.

Table 4.16: Age of respondents

		AGE				
		20 and under	21-30	31-40	41-50	Total
TOP 3 BRAND	Uber	4	75	21	0	100
	GrabTaxi	8	153	48	4	213
	Easy Taxi	8	74	1	4	87
Total		20	302	70	8	400

302 respondents (75.5%) is 21-30 years old, 70 respondents (17.5%) is 31-40 years old, 20 respondents (5%) is 20 years old and under, and 8 respondents (2%) is 41-50 years old.

Table 4.17: Income of respondents

		INCOME						
		฿15,000 and less	฿15,001 – ฿25,000	฿25,001 – ฿35,000	฿35,001 – ฿45,000	฿45,001 – ฿55,000	฿55,001 and more	Total
TOP 3 BRAND	Uber	13	22	8	17	20	20	100
	GrabTaxi	47	76	26	28	8	28	213
	Easy Taxi	27	40	16	0	0	4	87
Total		87	138	50	45	28	52	400

138 respondents (34.5%) has income at ฿15,001 – ฿25,000, 87 respondents (21.75%) has income at ฿15,000 and less, 52 respondents (13%) has income at ฿55,001 and more, 50 respondents (12.5%) has income at ฿25,001 – ฿35,000, 45 respondents (11.25%) has income at ฿35,001 – ฿45,000, and 28 respondents (7%) has income at ฿45,001 – ฿55,000.

Table 4.18: Education of respondents

		INCOME					
		High school or equivalent	Vocational/ technical school	Some college	Bachelor's degree	Master's degree	Total
TOP 3 BRAND	0	8	8	58	26	100	100
	4	4	24	129	52	213	213
	4	0	0	59	24	87	87
Total		8	12	32	246	102	8

246 respondents (61.5%) got bachelor's degree, 102 respondents (25.5%) got master's degree, 32 respondents (8%) studied in some college, 12 respondents (3%) studied in vocational/technical school, and 8 respondents (2%) studied in high school or equivalent.

CHAPTER 5

DISCUSSION AND CONCLUSION

In this chapter, the researcher summarizes the overall important aspect of this research along with discussion related to the results from this research and opinions for future related research. The researcher's main purpose is to study the factors influencing consumer brand choices of top 3 taxi booking mobile applications in Bangkok: Uber, Grabtaxi and Easy Taxi. The research has been conducted between October 2015 – January 2016 based in Bangkok, Thailand and it is conducted for beneficial purposes to business owners, investors, marketing experts related to Thai taxi's consumers and taxi booking mobile application or other app.

The result of this study can improve marketing factors, mobile application, brand and consumer behavior on consumer brand choice section to create and raise more advantages over competitors, and to be a guideline for planning and adapting marketing strategy in order to comply with shifting customer's demands and improve special marketing channel such as social media. There are three research questions of this study as following,

- What is the most influencing factor in marketing mix toward consumer brand choices of top 3 taxi booking mobile applications in Bangkok: Uber, Grabtaxi and Easy Taxi?
- Is social media and influential people related to purchasing decision of top 3 taxi booking mobile applications in Bangkok: Uber, Grabtaxi and Easy Taxi?
- Is the role or function of application important for brand choice?

In this study, the researcher created theoretical foundation of the conceptual framework to analyzed and explored which led to the following hypotheses,

Since P-value of βService < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H1o: βService, Security, Convenience = 0
- H1a: At least one of βService, Security, Convenience ≠ 0

Since P-value of βPrice < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H2o: βReasonable, Cash payment, Credit card payment = 0
- H2a: At least one of βReasonable, Cash payment, Credit card payment ≠ 0

Since P-value of βPlace > .05; therefore, we cannot reject null hypothesis and cannot conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H3o: βAvailability in business area, Availability in residential area, Availability of taxi number =0
- H3a: At least one of β Availability in business area, Availability in residential area, Availability of taxi number ≠ 0

Since P-value of βPromotion > .05; therefore, we cannot reject null hypothesis and cannot conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H4o: βDiscount, Special Offers, Advertising = 0
- H4a: At least one of βDiscount, Special Offers, Advertising ≠ 0

Since P-value of βPhysical evidence < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H5o: βCar condition, Car type, Cleanliness = 0
- H5a: At least one of β Car condition, Car type, Cleanliness ≠ 0

Since P-value of βProcess < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H6o: βOnline booking, Service during the trip, Giving feedback = 0
- H6a: At least one of β Online booking, Service during the trip, Giving feedback ≠ 0

Since P-value of βPeople < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H7o: β Friendliness and Politeness, Knowledge and skill, Trust and credibility = 0
- H7a: At least one of β Friendliness and Politeness, Knowledge and skill, Trust and credibility ≠ 0

Since P-value of βMobile Application < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H8a: β Simplicity, Clear, user-friendly navigation, Good use of color, Well-formatted content, Speed/ Fast load time, Professional web/app design = 0
- H8o: At least one of β Simplicity, Clear, user-friendly navigation, Good use of color, Well-formatted content, Speed/ Fast load time, Professional web/app design ≠ 0

Since P-value of βBrand < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H9o: β Brand Awareness , Brand Loyalty, Brand Reputation = 0
- H9a: At least one of βBrand Awareness , Brand Loyalty, Brand Reputation ≠ 0

Since P-value of βConsumer Behavior < .05; therefore, we can reject null hypothesis and conclude that service significantly influences taxi booking mobile applications in Bangkok.

- H10o: β Economic situation , Lifestyles, Influential people, Social network, Social trend = 0
- H10a: At least one of β Economic situation , Lifestyles, Influential people, Social network, Social trend ≠ 0

This independent study is a quantitative research, which distributes questionnaires via online channel to random sample group as tool of data collection process. Population of the research is taxi app's users who have experienced on online taxi booking service: Uber, GrabTaxi, and Easy Taxi within Bangkok area.

The total number of sample group is 400 respondents: 213 GrabTaxi app's users, 100 Uber app's users and 87 Easy Taxi app's user. The questionnaire has an instrument to collect data in order to examine and identify the factors influencing consumer brand choices among 3 taxi booking applications: Uber, GrabTaxi and Easy Taxi. This questionnaire consists of four parts. The first part consists of general information. The second part requires the information of marketing factors influencing consumer brand choices. The Third part deals with consumer behavior influencing consumer brand choices. The last part is demographic of the respondent which information collected includes gender, age, career, income level, lifestyle, etc.

5.1 Conclusion

As the most used taxi booking mobile application, 213 of respondents (53.25%) choose GrabTaxi, 100 of respondents (25%) choose Uber, 87 of respondents (21.75) choose Easy Taxi. 176 respondents (44%) is male, 224 respondents (56%) is female. Most of male (18.75%) choose Grabtaxi and most of female (34.5%) also choose GrabTaxi. Most respondents (75.5%) is around 21-30 years old.

As comparing between Uber and Easy Taxi, Uber has significant in brand choice more than Easy Taxi in the aspect shown below:

- Product or service (.001 < .05),

- Promotion (.010 < .05)
- Physical evidence (.008 < .05)
- Process (.006 < .05)
- Mobile Application (.001 < .05)
- Consumer Behavior (.013 < .05)

As comparing between GrabTaxi and Easy Taxi, GrabTaxi has significant in brand choice more than Easy Taxi in the aspect shown below:

- Product or service (.000 < .05)
- Promotion (.000 < .05)
- Physical evidence (.000 < .05)
- Mobile Application (.000 < .05)
- Consumer Behavior (.001 < .05)

5.2 Discussion

In this research, the researcher studies about the factors that influence consumer brand choice of top three taxis booking mobile application in Bangkok, Thailand. In recent year, technology and smart phone play more important role in Thai society.

According to the taxi app market in Hong Kong, it has potential in app-dominated service. However, the taxi market is still in the middle of a traditional one to an app-dominated one, there will be only several taxi apps can survive. (Jacky W. Y. Chan, Vicky L. N. Chang, William K. Lau, Lawrence K. T. Law, & Corrine J. Lei., 2015)

The researcher found that it's quite similar to taxi market in Bangkok, most of people still use a traditional one. Anyways, the mobile application is very popular and become trend in Thai lifestyle.

Technology has changed Thai society in many ways and younger society has less patience that 5 minutes of waiting is considering late. Taxi booking application or taxi E-hailing is growing which provide more convenience for people who live in Bangkok by making taxi hailing more efficient. Taxi booking application can create value while solving the mismatch between demand and supply, directly booking taxi to people in need.

5.3 Managerial Implications

In business aspect, business owners, investors, entrepreneur can use the results from this study to see and understand that the main factors influencing consumer brand choice of top 3 taxi booking mobile applications in Bangkok: Uber, Grabtaxi and Easy Taxi. Process, security, convenience, reasonable price, cash payment, credit payment, availability in business area, availability in residential area, car condition, cleanliness, online booking, driver's friendliness and politeness, driver's knowledge and skill, driver's trust and credibility and lifestyle are the main components that help contributing both users to fulfill their needs before choosing service and business owner to make more benefits on taxi booking mobile application.

5.4 Recommendation for Future Research

The results of this study can use as a recommendation for standards, guidelines and development for taxi booking mobile application or related field in the

future. This paper was limited in Bangkok only, so the future research can have a comparative study with other city then more demographic factors could be added for the other future studies.

Furthermore, an understanding about the tech and marketing can help the firms or company to make a good strategy for their business.

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APPENDIX

Appendix A: Questionnaire

The Survey on Study of Factors Influencing Consumer Brand Choice of Top 3 Taxi Booking Mobile Applications in Bangkok: Uber, Grabtaxi and Easy Taxi

As part of my MBA Independent Study course in Bangkok University, The researcher is conducting a survey that investigate "Factors Influencing Consumer Brand Choice of Top 3 Taxi Booking Mobile Applications in Bangkok: Uber, Grabtaxi and Eaxi Taxi". The researcher will appreciate if the attendant completes the following question. Any information obtained in connection with this study that can be identified with you will remain confidential.

แบบสอบถามหัวข้อ Study of Factors Influencing Consumer Brand Choice of Top 3 Taxi Booking Mobile Applications in Bangkok: Uber, Grabtaxi and Easy Taxi นี้เป็นส่วนหนึ่งของรายวิชา Independent Study คณะบริหารธุรกิจ ปริญญาโท มหาวิทยาลัยกรุงเทพ ผู้วิจัยต้องขอขอบพระคุณผู้ตอบแบบสอบถามและยืนยันว่าข้อมูลทั้งหมดจะถูกนำมาใช้ในการศึกษารายวิชานี้เท่านั้น ไม่มีการเผยแพร่ข้อมูลส่วนตัวใดๆแก่สาธารณะ

This survey is divided into 4 parts: แบบสอบถามชุดนี้ถูกแบ่งออกเป็น 4 ส่วน ได้แก่

1. General information แบบสอบถามข้อมูลทั่วไป
2. Marketing factors influencing consumer brand choices

   ปัจจัยทางการตลาดที่ส่งผลต่อการตัดสินใจเลือกแบรนด์

3. Consumer behavior influencing consumer brand choices

   พฤติกรรมการบริโภคที่มีผลต่อการตัดสินใจเลือกแบรนด์

4. Demographic ข้อมูลของผู้ตอบแบบสอบถาม

Part 1: General information แบบสอบถามข้อมูลทั่วไป

Q1. What is your most used taxi booking mobile app?

แอพพลิเคชั่นแท็กซี่ที่ใช้บ่อยที่สุดของคุณคืออะไร

○ Uber อูเบอร์ ○ Grabtaxi แกรบแท็กซี่ ○ Easy Taxi อีซี่แท็กซี่

Q2. Ranking the below factors influencing consumer brand choice of the mobile applications chosen in Q1

โปรดให้คะแนนปัจจัยที่ส่งผลต่อการเลือกใช้บริการแท็กซี่แอพที่ท่านเลือกตามคำถามที่ 1

Not any effective ←——→ Extremely important

ไม่มีผล สำคัญอย่างยิ่ง

Please select the number that correspond with your opinion	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
2.1 Taxi Service บริการแท็กซี่								
2.2 Price ราคา								
2.3 Availability ความพร้อมในการให้บริการ								
2.4 Promotion การส่งเสริมการให้บริการ								
2.5 Car condition สภาพรถที่ให้บริการ								
2.6 Service Quality คุณภาพของบริการ								

Please select the number that correspond with your opinion	0	1	2	3	4	5	6	7
2.7 Driver คนขับ								
2.8 Mobile Application แอพพลิเคชั่นบนมือถือ								
2.9 Brand Name แบรนด์								
2.10 Consumer Behavior พฤติกรรมการบริโภค								

Part 2: Marketing factor influencing consumer brand choices

ปัจจัยทางการตลาดที่ส่งผลต่อการตัดสินใจเลือกแบรนด์

Q3. **Marketing Mix (7Ps)** ส่วนผสมทางการตลาด

Not at all important Very important

ไม่สำคัญ ⟷ สำคัญมาก

Please select the number that correspond with your opinion	1	2	3	4	5
Product/Service สินค้า/บริการ					
3.1 Service บริการ					
3.2 Security ความปลอดภัย					
3.3 Convenience ความสะดวก					
Price ราคา					
3.4 Reasonable สมเหตุสมผล					
3.5 Pay by cash การจ่ายด้วยเงินสด					
3.6 Pay by credit card การจ่ายด้วยบัตรเครดิต					

Please select the number that correspond with your opinion	1	2	3	4	5
Place สถานที่					
3.7 Availability in business area ความพร้อมให้บริการในย่านธุรกิจ					
3.8 Availability in residential area ความพร้อมให้บริการในย่านที่อยู่อาศัย					
3.9 Availability of number of taxi จำนวนแท็กซี่ที่พร้อมให้บริการ					
3.7 Availability in business area ความพร้อมให้บริการในย่านธุรกิจ					
3.8 Availability in residential area ความพร้อมให้บริการในย่านที่อยู่อาศัย					
3.9 Availability of number of taxi จำนวนแท็กซี่ที่พร้อมให้บริการ					
3.12 Advertising การโฆษณา					
Physical Environment สภาพแวดล้อมทางกายภาพ					
3.13 Car condition สภาพรถ					
3.14 Car types ประเภทรถ					
3.15 Cleanliness ความสะอาด					
Process ขั้นตอน					
3.16 Online booking การจองออนไลน์					
3.17 Service during the trip การบริการขณะเดินทาง					
3.18 Giving feedback การให้คำติชมหลังใช้บริการ					

Please select the number that correspond with your opinion	1	2	3	4	5
Driver คนขับ					
3.19 Friendliness and politeness ความเป็นมิตรและความสุภาพ					
3.20 Knowledge and skill ความรู้ความสามารถของผู้ขับ					
3.21 Trust and credibility ความไว้วางใจและความน่าเชื่อถือ					

Q4. **Mobile application factors** ปัจจัยทางแอพพลิเคชั่นในมือถือ

Not at all important Very important

ไม่สำคัญ ⟷ สำคัญมาก

Please select the number that correspond with your opinion	1	2	3	4	5
4.1 Simplicity of Mobile application features ความเรียบง่ายของหน้าตาแอพพลิเคชั่น					
4.2 Clear, user-friendly navigation ความชัดเจน ง่ายต่อการใช้งาน					
4.3 Good use of color การใช้สีที่ดี					
4.4 Well-formatted content การใช้เนื้อหาที่ดี					
4.5 Speed/ Fast load time ความเร็วในการดาวน์โหลด					
4.6 Professional app design การออกแบบแอพอย่างมืออาชีพ					

Q5. **Brand** แบรนด์

Not at all important Very important

ไม่สำคัญ ⟷ สำคัญมาก

Please select the number that correspond with your opinion	1	2	3	4	5
5.1 Brand awareness การจดจำแบรนด์/ภาพลักษณ์					
5.2 Brand loyalty ความชื่นชอบ/ความซื่อสัตย์ที่มีต่อแบรนด์					
5.3 Brand reputation ชื่อเสียงของแบรนด์					

Part 3: Consumer behavior influencing consumer brand choices

พฤติกรรมการบริโภคที่มีผลต่อการตัดสินใจเลือกแบรนด์

Q6. **Consumer behavior** พฤติกรรมการบริโภค

Not at all important Very important

ไม่สำคัญ ⟷ สำคัญมาก

Please select the number that correspond with your opinion	1	2	3	4	5
6.1 Economic situation					
6.2 Lifestyles					
6.3 Influential people					
6.4 Social network					
6.5 Social trend					

Q7. Does economic situation affect your consumer behavior to use taxi booking mobile application? สถานการณ์ทางเศรษฐกิจมีผลต่อพฤติกรรมการใช้บริการแอพพลิเคชั่นแท็กซี่หรือไม่

- o Yes
- o No

Q8. How can you indicate your economic situation?

สถานการณ์ทางเศรษฐกิจของคุณเป็นอย่างไร

- o Excellent ดีเยี่ยม
- o Very good ดีมาก
- o Good ดี
- o Fair ปานกลาง
- o Poor แย่
- o Others, อื่นๆ_____

Q9. How often do you call taxi by using taxi booking mobile application?

คุณใช้บริการแอพพลิเคชั่นแท็กซี่บ่อยแค่ไหน

- o 3 times or less per week 3ครั้งหรือน้อยกว่าต่อสัปดาห์
- o 5 times or less per week 5ครั้งหรือน้อยกว่าต่อสัปดาห์
- o Everyday ทุกวัน

Q10. Who is the person affecting your purchasing decision of taxi application?

ในการใช้บริการแอพพลิเคชั่นแท็กซี่ ผู้มีอิทธิพลในการตัดสินใจใช้บริการคือใคร

- o Family ครอบครัว
- o Friends เพื่อน
- o Advertising โฆษณา
- o Social network เครือข่ายสังคม
- o Myself ตัวเอง
- o Other อื่นๆ_____

Q11. What social network do you often use?

เครือข่ายทางสังคมประเภทใดที่คุณใช้งานบ่อยที่สุด

- o Facebook เฟสบุ๊ค
- o Twitter ทวิตเตอร์
- o Instagram อินสตาแกรม
- o LinkedIn ลิ้งค์อิน
- o Tumblr ทัมเบลอ
- o Google+ กูเกิลพลัส
- o Youtube ยูทูป
- o Others อื่นๆ_____

Q12. Does the social network in Q10 affect your brand choices of taxi booking mobile application? If not, please specify social network that affect your choice decision on taxi booking mobile application.

เครือข่ายทางสังคมในข้อ 10 มีผลต่อการตัดสินใจเลือกใช้แท็กซี่แอพหรือไม่

ถ้าไม่ โปรดระบุเครือข่ายทางสังคมที่มีผลต่อการตัดสินใจเลือกใช้แท็กซี่แอพ

- o Yes ใช่
- o No, please specify_____

  ไม่ใช่, โปรดระบุ_____

Q13. Does social trend affect your brand choices of taxi booking mobile application?

ความนิยมทางสังคมหรือกระแสสังคมมีผลต่อการตัดสินใจเลือกใช้บริการแท็กซี่แอพหรือไม่

- o Yes ใช่
- o No ไม่ใช่

Q14. Will you use taxi booking mobile application again and happily recommend them to others? คุณจะใช้บริการแอพพลิเคชั่นแท็กซี่อีก และแนะนำให้คนอื่นใช้หรือไม่

- Definitely will ใช้แน่นอนแนะนำต่อ
- Definitely won't ไม่ใช้แน่นอนและไม่แนะนำต่อ
- Probably will อาจจะใช้และอาจจะแนะนำต่อ
- Probably won't อาจจะไม่ใช้และอาจจะไม่แนะนำต่อ

Part 4: Demographic ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

Q15. Job title/Profession อาชีพ_____

Q16. Gender เพศ

- Male ชาย
- Female หญิง

Q17. Age อายุ

- 20 and under 20ปีหรือต่ำกว่า
- 21-30
- 31-40
- 41-50
- 51-60
- 61 and over 61ปีหรือมากกว่า

Q18. Race/Ethnicity ชาติพันธุ์

- White
- Asian เอเชีย
- Hispanic or Latino
- Black
- Others_____

Q19. The highest level of education ระดับการศึกษาสูงสุด

- High school or less โรงเรียนมัธยมหรือต่ำกว่า
- High school or equivalent โรงเรียนมัธยมหรือเทียบเท่า
- Vocational/technical school สายอาชีพ / อาชีวะ
- Some college วิทยาลัย
- Bachelor's degree ปริญญาตรี
- Master's degree ปริญญาโท
- Professional degree การศึกษาวิชาเฉพาะทาง
- Doctoral degree ปริญญาเอก
- Others อื่นๆ_____

Q20. Employment status สถานการณ์จ้างงาน

- Full time employment พนักงานประจำ
- Part time employment พนักงานไม่ประจำ
- Self-employed ทำงานอิสระ
- Unemployed ว่างงาน
- A student นักเรียน/นักศึกษา
- Retired ปลดเกษียณ
- Others อื่นๆ_____

Q21. Income per month รายได้ต่อเดือน

- ฿15,000 and less 15,000บาท หรือน้อยกว่า
- ฿15,001 – ฿25,000
- ฿25,001 – ฿35,000
- ฿35,001 – ฿45,000
- ฿45,001 – ฿55,000
- ฿55,001 and more 55,001บาท หรือมากกว่า

Appendix B: Content Validity

Index of Item Objective Congruence (IOC) is the consistency between the objective and content or questions and objective which can be calculate from the formula below. Σ

$$IOC = \frac{\Sigma R}{N}$$

Where: IOC = Consistency between the objective and content or questions and objective.

Σ = Total assessment points given from all qualified experts.

N = Number of qualified experts.

There are 3 levels of assessment point as follow:

- +1 means the question is certainly consistent with the objective of the questionnaire.
- 0 means the question is unsure to be consistent with the objective of the questionnaire.
- -1 means the question is inconsistent with the objective of the questionnaire.

The consistency index value must have the value of 0.5 or above to be accepted.

Index of Item - Objective Congruence (IOC) from three experts result are as followed;

No.	Q. No.	Expert 1			Expert 2			Expert 3			Total Scores Σ	IOC Σ	Data Analysis
		1	0	-1	1	0	-1	1	0	-1			
1	1	√			√			√			3	1	Acceptable
2	2.1	√			√			√			3	1	Acceptable
3	2.2	√			√			√			3	1	Acceptable
4	2.3	√			√			√			3	1	Acceptable
5	2.4	√			√			√			3	1	Acceptable
6	2.5	√			√			√			3	1	Acceptable
7	2.6	√			√			√			3	1	Acceptable
8	2.7	√			√			√			3	1	Acceptable
9	2.8	√			√			√			3	1	Acceptable
10	2.9	√			√			√			3	1	Acceptable
11	2.10	√			√			√			3	1	Acceptable
12	3.1	√			√			√			3	1	Acceptable
13	3.2	√			√			√			3	1	Acceptable
14	3.3	√			√			√			3	1	Acceptable
15	3.4	√			√			√			3	1	Acceptable
16	3.5	√			√			√			3	1	Acceptable

No.	Q. No.	Expert 1			Expert 2			Expert 3			Total Scores Σ	IOC Σ	Data Analysis
		1	0	-1	1	0	-1	1	0	-1			
17	3.6	√			√			√			3	1	Acceptable
18	3.7	√			√			√			3	1	Acceptable
19	3.8	√			√			√			3	1	Acceptable
20	3.9	√			√			√			3	1	Acceptable
21	3.10	√			√			√			3	1	Acceptable
22	3.11	√			√			√			3	1	Acceptable
23	3.12	√			√			√			3	1	Acceptable
24	3.13	√			√			√			3	1	Acceptable
25	3.14	√			√			√			3	1	Acceptable
26	3.15	√			√			√			3	1	Acceptable
27	3.16	√			√			√			3	1	Acceptable
28	3.17	√			√			√			3	1	Acceptable
29	3.18	√			√			√			3	1	Acceptable
30	3.19	√			√			√			3	1	Acceptable
31	3.20	√			√			√			3	1	Acceptable
32	3.21	√			√			√			3	1	Acceptable
33	4.1	√			√			√			3	1	Acceptable
34	4.2	√			√			√			3	1	Acceptable
35	4.3	√			√			√			3	1	Acceptable

No.	Q. No.	Expert 1			Expert 2			Expert 3			Total Scores Σ	IOC Σ	Data Analysis
		1	0	-1	1	0	-1	1	0	-1			
36	4.4	√			√			√			3	1	Acceptable
37	4.5	√			√			√			3	1	Acceptable
38	4.6	√			√			√			3	1	Acceptable
39	5.1	√			√			√			3	1	Acceptable
40	5.2	√			√			√			3	1	Acceptable
41	5.3	√			√			√			3	1	Acceptable
42	6.1	√			√			√			3	1	Acceptable
43	6.2	√			√			√			3	1	Acceptable
44	6.3	√			√			√			3	1	Acceptable
45	6.4	√			√			√			3	1	Acceptable
46	6.5	√			√			√			3	1	Acceptable
47	7	√			√			√			3	1	Acceptable
48	8	√			√			√			3	1	Acceptable
49	9	√			√			√			3	1	Acceptable
50	10	√			√			√			3	1	Acceptable
51	11	√				√		√			2	0.67	Acceptable
52	12	√			√			√			3	1	Acceptable
53	13	√			√			√			3	1	Acceptable

No.	Q. No.	Expert 1			Expert 2			Expert 3			Total Scores Σ	IOC Σ	Data Analysis
		1	0	-1	1	0	-1	1	0	-1			
54	14	√			√			√			3	1	Acceptable
55	15	√			√			√			3	1	Acceptable
56	16	√			√			√			3	1	Acceptable
57	17	√			√			√			3	1	Acceptable
58	18	√			√			√			3	1	Acceptable
59	19	√			√			√			3	1	Acceptable
60	20	√			√			√			3	1	Acceptable
61	21			√		√		√			0	0	Deny

$$IOC = \frac{\Sigma R}{N}$$

Where: IOC = Consistency between the objective and content or questions and objective.

Σ = Total assessment points given from all qualified experts.

N = Number of qualified experts.

Therefore,

$$IOC = \frac{59.67}{61}$$

$$= 0.978$$

The assessment result of questions on this questionnaire has value index of item objective congruence (IOC) equal to 0.978 with one question that has IOC index less than 0.5.

Appendix C: Factor Analysis

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	18.997	54.277	54.277	18.997	54.277	54.277	8.689	24.826	24.826
2	2.419	6.912	61.189	2.419	6.912	61.189	4.840	13.830	38.656
3	1.910	5.458	66.647	1.910	5.458	66.647	3.981	11.374	50.030
4	1.614	4.610	71.257	1.614	4.610	71.257	3.532	10.092	60.122
5	1.283	3.665	74.922	1.283	3.665	74.922	3.481	9.946	70.068
6	1.002	2.863	77.785	1.002	2.863	77.785	2.701	7.717	77.785
7	.820	2.344	80.129						
8	.709	2.027	82.156						
9	.624	1.782	83.938						
10	.612	1.748	85.686						
11	.560	1.601	87.287						
12	.516	1.473	88.760						
13	.451	1.289	90.049						
14	.398	1.137	91.186						
15	.391	1.116	92.302						
16	.382	1.090	93.392						
17	.338	.965	94.357						
18	.287	.820	95.177						

19	.255	.729	95.906						
20	.221	.630	96.536						
21	.207	.591	97.127						
22	.196	.559	97.687						
23	.159	.454	98.141						
24	.149	.425	98.566						
25	.122	.349	98.915						
26	.119	.340	99.255						
27	.095	.271	99.526						
28	.074	.212	99.737						
29	.069	.196	99.933						
30	.023	.067	100.000						
31	2.726E-016	7.789E-016	100.000						
32	1.375E-016	3.928E-016	100.000						
33	5.376E-017	1.536E-016	100.000						
34	3.683E-017	1.052E-016	100.000						
35	1.119E-017	3.196E-017	100.000						

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