

Determinants Of Consumer Decision Making Of A Common Ticketing System In Bangkok's Metropolitan Commuter Transportation Systems

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ABSTRACT

The word "commuter" is an American invention. In the 1840s people living in the suburbs could pay a reduced or "commuted" fare to use the trains to get into the cities. The world's worst commute is in Bangkok, Thailand, where people spend about 2 hours a day travelling to and from work. At peak times the average speed of traffic in Bangkok is 7 mph with the total number of vehicles with Bangkok license plates hitting 8.55 million, double the 4.28 registered in 2004. There is hope however as Bangkok during this period has delivered several commuter rail systems. The 15 year old 'Skytrain' system has just passed its 2 billionth rider while the 10 year old subway sees 240,000 riders a day. Bangkok's newest airport 'rail-link' system to the suburban international airport while designed for air travelers, has become an access point for suburban commuters. With these three systems however there is no common ticketing system that allows transfer between systems, thus the reason for this paper's research. Simple Random Sampling was used to obtain questionnaires' from 300 Bangkok commuters in which it was determined that individual decision making has the greatest influence, both directly and indirectly, on the use of a common ticketing system. External variables has the second greatest influence, again both directly and indirectly with a commuter's personal habits influencing the decision making process in only a limited but direct way.

Keywords: Common Ticketing System; Commuter Rail System; Decision Making; Bangkok Thailand

INTRODUCTION

The need for efficient and effective mass rapid transit systems can be seen from the gridlock and chaos from Bangkok's vehicle commuters with the title of the 'world's worst commute' having been given to Bangkok, where people now spend 2 hours a day travelling to and from work. At peak times, the average speed of traffic in Bangkok is 7 mph (Express, 2014) which is only slightly double the speed that humans walk. With official statistics now stating that the total number of vehicles with Bangkok license plates has reached 8.55 million, double that of the 4.28 million registered in all of 2004 (Bangkok Post, 2014).

To offset this congestion the Bangkok Metropolitan Administration (BMA) has set an ambitious target to reduce the use of private cars in the city by 30 percent over the next 15 years and to encourage more motorists to turn to mass transit as an alternative mode of travelling (THAIPBS, 2014). This appears to be working as only 1,263 owners registered their vehicles each day in 2014 compared with 1,954 vehicles a day in 2013 (Bangkok Post, 2014).

Things are moving in the right direction but as the expression goes, "time is money" and the problem with interconnecting between the above systems is that it takes time. Consumers often times need to queue up twice at

stations on both the BTS, once to change money and the second time to buy a ticket. Considering the fact that the Bangkok BTS has just reached its 2 billionth rider in 15 years, one can quickly understand the magnitude of the problem as many riders are connecting from other systems such as the MRT subway or SRT rail-link and are losing considerable time (and money?) in doing so.

In the Moscow Metro System which is one of the world’s busiest metro systems, with 12 lines and 172 stations, an Automatic Fare Collection (AFC) system was implemented based on RFID technologies. Moscow’s population is just under 9 million and every day the metro system carries more than 8 million passengers, with time being a major concern for many urban commuters (Somapa and Fongsuwan, 2015).

Using Moscow’s Metro System RFID system speeded up journey times, increased reliability and cut down on ticket fraud. With the new system in place congestion is reduced, with less delays and fewer headaches for the millions of people using the Moscow metro system (Swedberg, 2007).

There are however other successful models around the world in which convenient and efficient commuter payment systems can be seen. In Asia, one only needs to look to Hong Kong to find the world’s second contactless smart card system, after only Korea’s Upass. These systems integrated their various metropolitan and territorial systems into one. This success as led to other global capitals implementation, such as the development of the Oyster Card in London, with all these systems evolving as not only payment systems for commuters but as consumer payment systems both inside and outside the transportation networks.

Plans for a commuter-friendly Bangkok were laid out as early as 2012, getting around the city promised to be cheaper and more convenient as early as 2015. The easiest and least expensive part of the government’s plan was the introduction of a joint-ticketing system whereby commuters could gain access to all forms of mass transit – elevated trains, subway trains, buses and boats – by using a single ticket (Bangkok Post, 2012).

Thailand’s new government which refers to itself as ‘The National Council for Peace and Order’ (NCPO) has agreed in principle to implement a set of projects known as the *Strategies on Thailand’s Infrastructure Development in Transportation (2014– 2022)*, as proposed by the Ministry of Transport. Thailand’s national infrastructure, particularly its transport network, is set to undergo a long-awaited transformation over the next eight years, following the approval of a US\$75 billion (Bt2.4 trillion) master plan by the country’s ruling military regime (TIR, 2014).

Table 1. 2.4 Trillion THB Infrastructure Plan

Projects	THBbn
Double Track Railway	670
Mass Transit	900
Road and Motorway	640
Water Transport and Irrigation	100
Aviation	90
Total	2,400

Source: Thailand’s Ministry of Transport, July 2014

The primary goal of the government is to restructure the Thai transportation system by accelerating the expansion and improvement of the national railway network to correct the country’s lopsided dependence on road transportation. Thus, 78% of the Bt2.4 trillion budgeted for investment in the transportation infrastructure of Thailand over the next seven years would be devoted to railway development (Table 1). Among other aims, the government seeks to cut Thailand’s logistics costs from 15.2% to 13.2% of GDP, create 1.6 million jobs; and raise annual GDP growth by 1%. The real benefit to be derived is the enhanced competitiveness of the country after Thailand’s transportation and logistics have been restructured (TIR, 2014).

Another major component is to expand Bangkok’s mass transit system by 400km from the current 80km by 2017 (Table 1). As a result, transportation consumes as much as 31% of Thailand’s energy use (industrial production by comparison accounts for 41%). Typically, transportation accounts for about 15% of total energy use in advanced countries.

It was reported by the Bangkok Post (2014) that the NCPO has approved two high-speed train projects (with a maximum velocity of 160 kilometers per hour) at a total cost of Bt741.4 billion. Indeed, the two routes approved are intended to serve as a transport link between Thailand and southern China. The Nong Khai-Map Ta Phut route will be 737km in length and cost Bt392.5 billion while the Chiang Khong-Ban Phachi route will be 655km long and cost Bt348.8 billion. The construction of these two high-speed train routes is part of the eight-year infrastructure development scheme beginning this year (TIR, 2014).

The intent of this research was therefore to study the linking strategies of a common ticketing system that would better serve Bangkok metropolitan area commuters as well as to provide information to agencies involved in marketing strategies concerning a common ticketing system for Bangkok's metropolitan commuter systems. A Structural Equation Model was employed to analyze the variables either directly or indirectly affecting Bangkok consumer's use of a common ticketing system decision-making process.

CONCEPTUAL DEVELOPMENT

Internal Factors of Decision-Making

Perception – Motivation – Attitudes

Research by many scholars on the acceptance of IT (Information Technology) has been studied in terms of human behavior to explain how and why an individual recognizes new Information Technology (IT). Understanding individual acceptance and use of information technology is one of the most mature areas of information systems research (Benbasat and Barki 2007). Hevner et al. (2004) went on to explain and forecast how IT adoption works. Brancheau et al. (1996) examined how to build an understanding of the influence of various factors for the catalyst for the adoption and use of information technology for individuals or individual organizations. Xu et al. (2004) also demonstrated IT investment rationality for future applications.

Venkatesh et al. (2007) elaborated further on individual acceptance of technology and earlier reviewed the theoretical models developed from theories in psychology and sociology (Venkatesh et al. 2003) and attempted to describe technology acceptance and use. From this research a unified theory of acceptance and use of technology was developed from 8 previous models/theories which was labelled UTAUT (Venkatesh et al. 2003). UTAUT has distilled the critical factors and contingencies related to the prediction of behavioral intention to use a technology and technology use, primarily in organizational contexts.

Chen and Tseng (2012) used the Technology Acceptance Model (TAM) to examine factors influencing the intention to use Web-based e-learning by junior-high school teachers in central Taiwan. Perceived usefulness and motivation to use were the primary reasons for the acceptance by junior high school teachers of web-based e-learning systems for in-service training.

Chung and Lee (2003) found that product perceptions, customer service, perceived ease of use, site image, promotion and communications environments are all positively related with the repurchase intention. It was also discovered however that perceived consumer risk shows a negative relationship with the repurchase intention.

Research on Czech consumers by Zagata (2012) found that consumers share beliefs about positive health effects, environmentally friendly production and better taste of organic food. During the first phase of the research the ToPB model (theory of planned behavior) was tested, afterwards belief-based factors that influence the decisions and behavior of consumers were investigated. The theory proved able to predict and explain the behavior of Czech consumers. The best predictors of the intention to purchase are attitudes towards the behavior and subjective norms. Decisive positions in consumers' beliefs have product- and process-based qualities (Zagata, 2012).

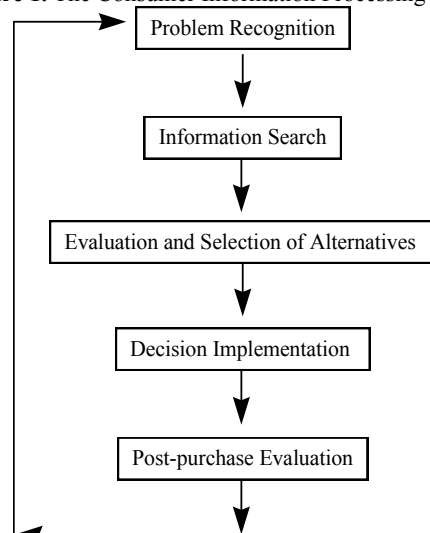
Another group of scholars working together over many years has led to two other theories to determine consumer behaviors. One is the theory of reasoned action (TRA) (Fishbein and Ajzen, 1975; Ajzen & Fishbein, 1980) which later led to the theory of planned behavior (TPB) (Ajzen & Madden, 1986) which has been used to explain behavior differences.

As in the original theory of reasoned action, a central factor in the theory of planned behavior is the individual’s intention to perform a given behavior. Intentions are assumed to capture the motivational factors that influence a behavior; they are indications of how hard people are willing to try, of how much of an effort they are planning to exert, in order to perform the behavior. As a general rule, the stronger the intention to engage in a behavior, the more likely should be its performance (Ajzen, 1991).

Additionally, the theory of consumer behavior provides the framework for analyzing and understanding buyer behavior (Schiffman and Kanuk, 2000). Schiffman and Kanuk (1997) defined consumer behavior as “*the behaviour that consumers display in searching for purchasing, using, evaluating and disposing of products, services and ideas.*” Schiffman and Kanuk (1997) further elaborated on their definition by explaining that consumer behavior is therefore the study of how individuals make decisions to spend their available resources (time, money, effort) on consumption-related items.

According to Kotler (1997) consumers normally approach decision making processes from a rational perspective. This dominant school of thought views consumers as being cognitive (i.e., problem-solving) and, to some but a lesser degree, emotional. Such a view is reflected in the stage model of a typical buying process (often called *the consumer information processing model*) depicted in Figure 1.

Figure 1. The Consumer Information Processing Model



Source: Adopted from Kotler (1997), Schiffman and Kanuk (2000), and Solomon (1996)

In this model, the consumer passes through five stages: problem recognition, information search, evaluation and selection of alternatives, decision implementation, and post-purchase evaluation.

The above research has therefore led to the study’s first and third hypotheses (Figure 2):

H1: Internal Factors have a significant and direct effect on Personal Characteristics.

H3: Internal Factors have a direct effect on the Decision-Making process.

External Factors on Decision-Making

Family – Reference Group – Marketing Activities

Decision-making can be regarded as the cognitive process resulting in the selection of a belief or a course of action among several alternative possibilities. In North America, consumer decision making processes have been studied extensively but little comprehension exists outside it of how culturally-based social influences (Hofstede,

1980; Hofstede and Bond, 1988; Kluckhohn and Strodtbeck, 1961) affect the utility of widely accepted models of consumer decision-making processes (e.g. Engel, Kollat and Miniard, 1986). This understanding however is critical as the world becomes more integrated and moves towards a global society.

Siu and Hui (2001) studied cross cultural consumer decision-making styles in China and concluded that four decision-makings styles, namely, *Perfectionistic*, *Novelty-Fashion Conscious*, *Recreational* and *Brand Conscious*, are common characteristics to both Americans and Chinese. Consumer decision-making style is defined 'as a mental orientation characterizing a consumer's approach to making choice' (Sproles and Kendall 1986).

EMTA (European Metropolitan Transport Authorities) established a working group to study the issue of electronic ticketing in Europe. In the final report it was indicated that the greatest challenge for a pricing policy is to determine a tariff structure that reconciles the user's need for an affordable public service with the commercial interests of the operators, while at the same time pursuing the authority's social objectives. Decision-making about fare levels varies from one city to another and generally is decided by operators and authorities. Outside this however, even though the user is not involved in the initial fare rate decision-making process, he/she influences it indirectly because fare levels take into account affordability for the user. A high fare level will be perceived as anti-social and will reduce public transport use, unless it is part of a voluntary marketing policy targeting high-income people (EMTA, 2008).

When defining a fare structure it is important to carefully consider the following issues (EMTA, 2008):

1. Ease-of-use for passengers
2. Equity (types of users, types of trips)
3. Simplicity of revenue collection
4. Ease-of-control for operators
5. Attractiveness to passengers
6. Intermodality (transfer tickets)
7. Simplicity of clearing and sharing revenues between operators
8. Maximizing fare box revenues
9. Reducing fraud

The above research has therefore led to the following hypotheses (Figure 2):

H2: External Factors have a significant and direct effect on Personal Characteristics.

H4: External Factors have a direct effect on the Decision-Making process.

Personal Factors on Decision-Making

Ego – Lifestyle

Venkatesh et al. (2013) building on the previous decade of research on technology acceptance and use proposed UTAUT2 which incorporated three constructs into the older UTAUT model including hedonic motivation, price value, and habit. Individual differences—namely, age, gender, and experience—were hypothesized to moderate the effects of these constructs on behavioral intention and technology use.

Research tells us that interpersonal contact is an important factor, however not all kinds of information touch the consumer with the exposure to stimuli being selective. Often times it is based on reference groups, ego, lifestyle, culture and past experience. In Complex Decision Making there is a consistent involvement with the product, and the consumer passively receiving information and actively starting to search out additional information (Matsuno, 1997).

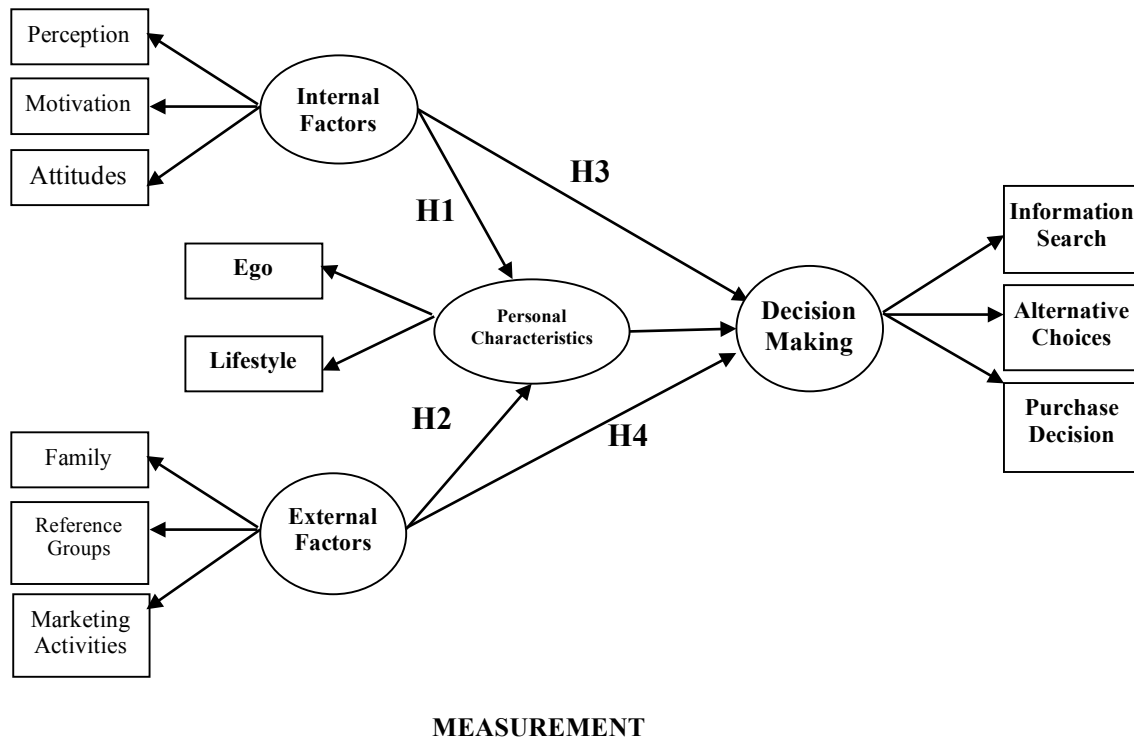
According to Cunningham and Turnbull (1982), interpersonal contact is of prime importance with the *ego-enhancement role*, which is a second form of social contact occurring when an individual deliberately establishes

contact with senior people in the supplier or buyer organization because they believe it will enhance their status in their own organization.

The above research has led to the following final and 5th hypothesis. All 5 hypotheses can be seen in Figure 2.

H5: Personal Characteristics have a direct influence on the Decision-Making process.

Figure 2. Decision-Making Model Development



Dependent Variable

Decision-Making to use a common ticketing system within the Bangkok mass transit systems consisted of 3 observed variables including Information Search, Alternative Choices and Purchase Decision.

Independent Variables

Independent variables used in this study included 8 latent variables consisting of 3 observed variables (Figure 3).

The scales of Internal Factors have been developed with an analysis tool and questionnaire using a 5-Point Likert Scale as a measuring scale (Likert, 1972) which measures three aspects of Internal Factors which include Perception, Motivation and Attitudes.

The scales of External Factors have been developed with an analysis tool and questionnaire using a 5-Point Likert Scale as a measuring scale (Likert, 1972) which measures three aspects of External Factors which include Family, Reference Groups and Marketing Activities.

The scales of Personal Characteristics have been developed with an analysis tool and questionnaire using a 5-Point Likert Scale as a measuring scale (Likert, 1972) which measures two aspects of Personal Characteristics which include Ego and the Lifestyle.

METHODOLOGY

Data Collection

Structural equation modeling (SEM) uses a number of models to determine the relationships between observed variables, all of which having the same objective of providing a quantitative test of a theoretical model hypothesized by a researcher (Schumacker and Lomax, 2010). Sample size is also an important component with many researchers recommending a sample size of at least 100 to generate good results (Worthington & Whittaker, 2006, Schumacker and Lomax, 2010; Cunningham, 2008; Weston and Gore, 2006). Sample sizes of less than 100 therefore should not be used if the objective is to generate accurate results though SEM modeling (Meldrum, 2010).

Questionnaire Design

This study drew from a consumer population of 300 individuals who used various mass transit systems in Bangkok including the BTS (Bangkok Transit System) ‘Skytrain’, Airport Rail-Link (ART) and the MRT (Metropolitan Rapid Transit) subway system between June-July, 2013. From the sample size determined by Schumacker and Lomax (2010), the researchers used the 10-20 sample size suggested for each variable. Using 20 as the optimum number and with the research consisting of 11 variables, 300 samples were collected by use of simple random sampling techniques which was deemed as more than adequate.

Questionnaires were constructed to measure concept definition and practice of mass rail system consumer use within the Bangkok Metropolitan Area (BMA). To establish questionnaire reliability 30 transit consumers were selected to test questionnaire reliability using a Cronbach's alpha coefficient, which in this study had a reliability level of 0.77.

A 5-Point Likert Scale (Likert, 1972) was employed for the questionnaire used as the measurement scale as well as to determine the conceptual framework of determining the internal consistency measured by coefficient alpha (α -coefficient) of Akron BAC (Cronbach) to calculate the average value of the correlation coefficient, which were considered to be highly reliable as all values lower than 0.50 were eliminated from the measurement.

Table 1. Confirmatory factor analysis results of the variables that influence the dependent variable of the Decision-Making Process

Latent Variables / Individual Items	Loading	t-test	R²
Internal Factors			
Perception	0.75	13.18	0.57
Motivation	0.77	13.54	0.60
Attitudes	0.73	12.77	0.53
External Factors			
Family	0.89	18.43	0.79
Reference Groups	0.84	17.11	0.71
Marketing Activities	0.81	16.20	0.66
Personal Characteristics			
Ego	0.76	13.23	0.59
Lifestyle	0.79	13.42	0.67
Decision-Making			
Information Search	0.79	15.59	0.63
Alternative Choices	0.81	15.97	0.65
Purchase Decision	0.91	18.76	0.83

The reflective model in Table 1 above shows the discriminant validity of the internal latent variables and the correlation of variables. It also depicts the scale reliability which has been analyzed from Composite Reliability

(CR) as well as the Average Variance Extracted (AVE) and R2. The CR value should not go below 0.60 and the AVE values should also drop below 0.50 and R2 values should not be under 0.20 (Lauro and Vinzi, 2004; Henseler, Ringle and Sinkovics, 2009).

Table 2 below shows the results of factor analysis affecting the decision-making process by Bangkok mass rapid transit system consumers. The data also shows the CR values are higher than 0.60, with all AVE values higher than 0.50 for all values and R2 values higher than 0.20, representing the reliability of the measurement. It found that data sets in the \sqrt{AVE} have higher values than all of the corresponding values in the ‘Cross Construct Correlation’ in the same column, representing discriminant validity of the measure in each construct and with a greater value than 0.50 of AVE as shown in Table 2.

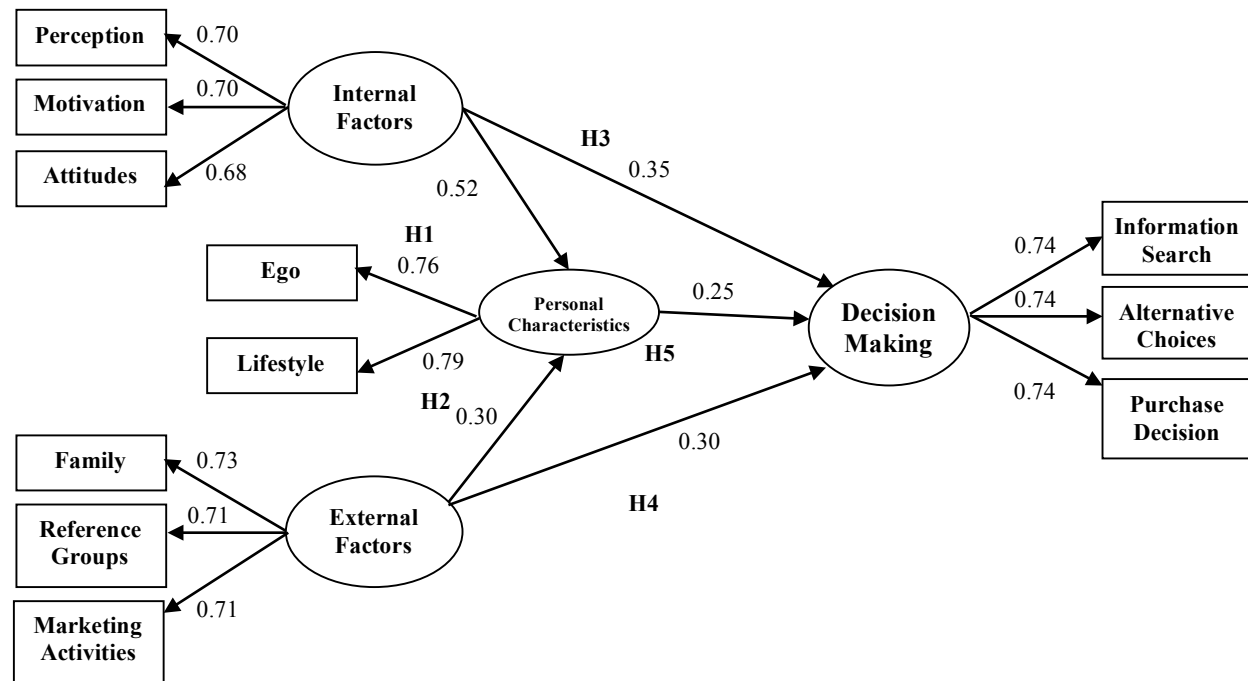
Table 2. Confirmatory Factor Analysis (CFA) of the independent variables of Internal Factors, External Factors and Personal Characteristics on the dependent variable, the Decision-Making Process.

Independent Variables	Construct Reliability : CR	Average Variance Extracted : AVE
Internal Factors	0.811	0.588
External Factors	0.885	0.718
Personal Characteristics	0.883	0.792
Decision-Making	0.904	0.736

Statistical significance level is at 0.01 and diagonal figures mean,

CR: Composite reliability, \sqrt{AVE} R² = Square of the correlation, AVE: Average variance extracted

Figure 3. Structural Equation Final Model for the Decision-Making Process by Bangkok mass transit consumers to use a common ticketing system



RESEARCH RESULTS

Confirmatory factor analysis (CFA) with LISREL 8.72 was used to analyze of the latent variables by use of a structural equation model of the relationship factors on the decision-making process of consumers wishing to use a common ticketing systems in the Bangkok mass transit systems showed the diagnostic accuracy of the model and

the influence of variables in the model using path analysis with latent variables. Analysis of LISREL 8.72 to prove the validation of the model, while the Goodness of Fit Measurement was used to measure the level of harmony of functions (Wiruchchai, N., 1995 and Ungsuchote, S. et al., 2008). The Hosmer-Lemeshow (2000) test for logistic regression is widely used to answer the question “How well does my model fit the data?” It is used frequently in risk prediction models. The test assesses whether or not the observed event rates match expected event rates in subgroups of the model population. The Hosmer-Lemeshow test specifically identifies subgroups as the deciles of fitted risk values. Models for which expected and observed event rates in subgroups are similar are called well calibrated. The Hosmer–Lemeshow test statistic is given by:

Model validation or PLS fit index is a measure of the following GoF equation as follows (Piriyakul, 2010):

$$H = \sum_{g=1}^G \frac{(O_g - E_g)^2}{N_g \pi_g (1 - \pi_g)}$$

$$GoF = \sqrt{\text{Commun} * R^2 R^2} = \frac{1}{J} \sum_j R^2(\xi_j, \xi_{q(\xi_j \rightarrow \xi_j)})$$

This analysis shows that the χ^2 is insignificant, statistically significant ($p > 0.05$) or the $\chi^2 / df < 2.00$ the RMSEA < 0.05 the GFI > 0.90 the AGFI > 0.90 and the SRMR < 0.05 . Furthermore, the second-order CFA fit indices of the 11 variables were confirmed by using the LISREL 8.72 program as the Chi-square has no statistical significance at level of 0.05 ($p > 0.05$), RMSEA < 0.05 , GFI > 0.90 , AGFI > 0.90 , RMR < 0.05 and SRMR < 0.05 (Wiruchchai, 1995 and Ungsuchote et al., 2008).

Table 3. Direct, Indirect and Total Effects of influencing variables on Bangkok consumer’s decision making process to use common ticketing systems

Predictor Variables	Effect of Dependent Variables					
	Personal Characteristics			Decision-Making Process		
	DE	IE	TE	DE	IE	TE
Internal Factors	0.52* (0.13)	-	0.52* (0.13)	0.35* (0.11)	0.14* (0.05)	0.49* (0.11)
External Factors	0.30* (0.11)	-	0.30* (0.11)	0.30* (0.09)	0.08 (0.04)	0.38* (0.10)
Personal Characteristics	-	-	-	0.25* (0.08)	-	0.25* (0.08)
Structural Equation Fit R²	62			71		

Chi-square = 9.25, df = 30, P-value = 0.99, RMSEA = 0.00 GFI = 0.99, AGFI = 0.99, SRMR = 0.00

* p < 0.05 DE-Direct Effect IE-Indirect Effect TE-Total Effect

Figure 3 and Table 3 show that the causal relationships model of the decision to use a common ticketing system to travel in Bangkok was developed with precision, because the model is consistent with the empirical data. The harmonized index of all the criteria, including the chi - square, had no statistically significant value as shown by RMSEA = 0.00 p = 0.99 for the GFI = 0.99 and the AGFI = 0.99 and the SRMR = 0.00.

Confirmatory Factor Analysis

The results of the CFA for a multi-factor model are summarized in Table 3. The chi-square test was statistically insignificant. Examining the other fit indices, and according to the correlated subscales, the CFI was 1.00, and the SRMR was 0.00, both indicating acceptable model fit. The RMSEA was 0.00, which is well above the cut-off for good model fit. The GFI was 0.99 and its variant AGFI was 0.99. Finally, the incremental fit indices of NFI and NNFI were 1.00 and 1.02, respectively. The latent variables in the model had a positive influence on the decision making variables to use a common ticketing system which could explain the variability of the decision to use common ticketing system being 71 percent. As all the above indices are scaled to be between 0 and 1, with larger numbers indicating a better fit and with a minimum criterion of 0.90, there is combined evidence concerning

how well the current model fits the data. The final structural model was verified to achieve a good fit with the empirical data.

Latent variables having both a direct and indirect influence on the use of a common ticketing system is Internal Factors with the influence of 0.49, while the remaining 2 of the variants, External Factors and Personal Characteristics having only an indirect influence on decision to use a common ticketing system. Considering the priority of the variables caused by the combined influence of the individual variables showed, variables that influence the use of common ticketing system most are Internal Factors from the consumer, External Factors and finally Personal Characteristics, with an effect of 0.49, 0.38, and 0.25, respectively.

Independent variables that the influence the use of ozone ionization technology (in descending order) are as follows:

Internal Factors underlying the external variables are influenced by Perception, Motivation and Attitude which have both a direct and indirect effect on consumer’s decision to use a common ticketing system within the Bangkok mass transit systems, which is statistically significant at 0.05 with an influence factor of 0.49 as shown in the Final Model in Figure 3 and Table 4.

External Factors underlying the external variables are influenced by Family, Reference Groups and Marketing Activities which have both a direct and indirect effect on a consumer’s decision to use a common ticketing system within the Bangkok mass transit systems, which is statistically significant at 0.05 with an influence factor of 0.28 as shown in the Final Model in Figure 3 and Table 4.

Personal Characteristics underlying the external variables are influenced by Ego and Lifestyle which have a limited but direct effect on a consumer’s decision to use a common ticketing system within the Bangkok mass transit systems, which is statistically significant at 0.05 with an influence factor of 0.25 as shown in the Final Model in Figure 3 and Table 4.

Table 4: Results of testing hypothesis on Bangkok commuter decision-making of a common ticketing system

Hypotheses	Coef.	t-test	Findings
H1: Internal Factors have a significant and direct effect on Personal Characteristics	0.52	4.12*	Supported
H2: External Factors have significant and direct effect on Personal Characteristics	0.30	2.70*	Supported
H3: Internal Factors has a direct influence on Decision-Making	0.35	3.15*	Supported
H4: External Factors has a direct influence on Decision-Making	0.30	3.27*	Supported
H5: Personal Characteristics has a direct influence on Decision-Making	0.25	3.02*	Supported

*Sig. < 0.05

DISCUSSION

Research in developing a Structural Equation Model of ‘*Determinants of Consumer Decision Making of a Common Ticketing System in Bangkok’s Metropolitan Commuter Transportation Systems*’ found that the latent variables in the model had a positive influence on the decision making variables to use a common ticketing system which could explain the variability of the decision to use common ticketing system being 71 percent. Internal factors included perception which included the methods in which consumers were informed and educated about a common ticketing system via mass marketing and public relations. Perception is very important in the market place because product branding is important as consumers while developing the decision making process. Motivation in the decision making process and the desire to purchase and use a common ticketing system originates to a large degree on the marketing activities such as billboards, posters, banners, word of mouth, public announcements, etc.

Attitudes include the beauty of the physical form of the ticket which might include collector editions, color, temples, historical sites, cartoons, etc. Also customer’s belief that the common ticketing system improves the consumer’s quality of life is also important.

This is consistent with theories of human behavior (Loudon and Bitta, 1993) in which input variables are the environmental stimuli that the consumer is subjected to, and is communicated from a variety of sources. Significant stimuli are actual elements of products and brands that the buyer confronts. Ries and Trout (1994) in 'The 22 Immutable Laws of Marketing' also stated that "marketing is not a battle of products, it's a battle of perceptions; and sometimes it's better to be first in the mind than to be first in the marketplace".

Thus brand image is about when the consumer looks at the company and that company's product positioning which are all a matter of perception. Even before purchase, consumers commonly look for cues about the firm's capabilities and quality (Berry and Clark 1986) with the physical environment is rich in such cues. (Rapoport 1982) and may be very influential in communicating the firm's image and purpose to its customers. Research suggests that the physical setting may also influence the customer's ultimate satisfaction with the service (Bitner 1990).

When research was conducted by the European Metropolitan Transport Authorities (EMTA) to investigate electronic ticketing in Europe, it was discovered that the greatest challenge for a pricing policy was the determination of a tariff structure that reconciles the user's need for an affordable public service with the commercial interests of the operators, while at the same time pursuing the authority's social objectives (EMTA, 2008). Decision-making about fare levels varies from one city to another and generally is decided by operators and authorities. Outside this however, even though the user is not involved in the initial fare rate decision-making process, he/she influences it indirectly because fare levels take into account affordability for the user. A high fare level will be perceived as anti-social and will reduce public transport use, unless it is part of a voluntary marketing policy targeting high-income people (EMTA, 2008).

When defining a fare structure it is important to carefully consider the following issues (EMTA, 2008):

1. Ease-of-use for passengers
2. Equity (types of users, types of trips)
3. Simplicity of revenue collection
4. Ease-of-control for operators
5. Attractiveness to passengers
6. Intermodality (transfer tickets)
7. Simplicity of clearing and sharing revenues between operators
8. Maximizing fare box revenues
9. Reducing fraud

The effect of atmospherics, or physical design and decor elements, on consumers and workers is recognized by managers and mentioned in virtually all marketing, retailing, and organizational behavior texts (Bitner, 1992). Forcing an individual to serve themselves which causes physical discomfort or mental stress is not cause for motivation to use or purchase a product or service.

Family also influences the decision making process and consumer decision making within the family has begun to receive a growing amount of attention with the increased realization of the magnitude of the effect that each individual within the family exerts over the consumer activities of this primary social group (Hall et al. 1995). The foundations for the study of how families buy products and services was set by Sheth in the 1974 treatise 'A Theory of Family Buying Decisions' (Hall et al. 1995). Decision-making activity involving the purchase of goods and services within a family appears to be more of an outcome of group decision making than ever before (Burns, 1992) with decision-making activity typically involving several family members who play a variety of roles in the process. These scholar's confirm the hypothesis of this study concerning the effect of family on the decision-making process.

CONCLUSION

In order to promote the use of a common ticketing system for travel in Bangkok, the various metropolitan transportation organizations need to be organized to promote such a decision. Focus should be given on a

commuter's personal characteristics as well as their individual variables (Internal Factors) as well as outside social and societal influences (External Factors). The relevant authorities should consider the findings of this research and apply them in ways that promotes a common ticketing system such as seen in world capitals such as London and Moscow as well as economic powerhouses such as Hong Kong. In Bangkok there needs to be a focus on different target groups such as students, government officials and employees.

AUTHOR INFORMATION

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