RESEARCH ARTICLE

Mobile Phone Customer Loyalty in Thailand: A Path Analysis Case Study

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Abstract Research was reviewed globally from mobile/cellular carriers to develop the six antecedents (customer satisfaction, perceived service quality, customer trust, corporate image, perceived value, and perceived switching costs) contributing to mobile customer loyalty in Thailand. Data were drawn from interviews with 515 Thai mobile users, who were asked about customer satisfaction, service quality perceptions, and customer loyalty. Findings suggest that perceived service quality and value have a direct positive influence on customer satisfaction: if the customer's perception of service quality and customer satisfaction is high, it has a strong influence on customer loyalty. Additionally, if the perceived service quality is high, it has a direct impact on perceived value and customer satisfaction, in terms of price, value, terms, and reasonable carrier services. Finally, perception regarding switching costs is recognized in non-monetary terms and plays a key role in influencing customer loyalty.

Keywords ASEAN, cellular services, customer satisfaction, service quality, customer satisfaction, Thailand

Of the world's estimated 7.4 billion people, it is believed that 5.2 billion have access to cellular/mobile phone technology (World Bank, 2016) which make 6,000 tweets each second, upload 100 hours of YouTube video each minute, make 240 million Google searches each hour, and send 106 billion emails each day (World Bank, 2014).

Mobile phones and mobile internet represent a total of 7.1 billion mobile subscriptions worldwide with an average of 1.94 mobile subscriptions per unique user (Kemp, 2015a). Consumers who make use of pre-paid phone cards represent 77% of the total subscribers while only 23% make use of mobile connections that are post-paid (monthly billing). Of these totals, 39% can make use of either 3G or 4G broadband services. Growth is in excess of 5% annually representing 185 million new users per year.

Within ASEAN's (Association of Southeast Asian Nations) 628 million, 10-nation consumer community, there are 233 million active mobile social media users,

compared to a total of 253 million active Internet users (Kemp, 2015b). From these totals, we find Thai Generation-Y consumers (Thais born between 1981 and 2000) to be some of the most connected users in the world, who are also the largest segment of Thai smartphone owners which have a lifetime spending potential of over USD $5 trillion (Siam Commercial Bank Economic Intelligence Center, 2015).

According to the Thai Office the National Broadcasting and Telecommunication Commission (NBTC, 2015), there were three major mobile operators at the end of 2015, which included AIS (Advanced Info Service Plc) with 45.56% market share, DTAC (Total Access Communication PLC) with 29.94% market share, and TRUE with 22.25% market share, which accounted for a total of 82.99 million subscriber lines.

In Thailand however, there has been much turmoil associated with spectrum ownership, bidding, and cost, with only AIS and TRUE having acquired 4G services and spectrum with the characteristics of each frequency band being different. According to the Siam Commercial Bank Economic Intelligence Center (2016), the introduction of 4G wireless technologies raises a mobile operator's revenue per user by 2–3% annually, which had been contracting by 2–4% annually prior to the introduction of 4G.

According to Yalavarthy (2015), advantages of a lower frequency spectrum allow operators to have greater geographical coverage or better penetration through buildings. Simply put, the power reduces faster as you go farther away from the tower with the reduction also being dependent on the frequencies, with lower frequencies losing power slower.

A typical 1800MHz tower has a cell radius of about 6km while a tower with 900MHz can reach 9 to 10 kilometers (Yalavarthy, 2015). This is one reason some companies are willing to pay more for a 900MHz band vs. an 1800MHz band. Also, while the lower frequency bands such as 900 MHz, have a larger coverage area, they however are not suitable for high or dense data usage. On the other hand, high frequency bands such as the 1800 MHz have lower coverage areas but can process larger quantities of data at higher speed. This spectrum limitation therefore warrants mobile operators to own multiple bands to serve both their rural provincial consumers that demand broader coverage with scattered data usage, and a high band to

service areas with high and dense data demand such as in urban Bangkok (Homchampa & Boonyavanich, 2014).

AIS

In late 2015, Advanced Wireless Network (AWN), a daughter company of AIS, won a bid for the 4G 1800MHz license spectrum reported to be among the most expensive bandwidth in the world (Mongkolporn & Toomgum, 2015a), the cost of which was to be absorbed by the consumer base of approximately 45 million, of which 44 million were 3G users and the rest are 2G users (Mongkolporn, 2015).

DTAC

Norway's Telenor is the parent company of Thailand's second largest mobile operator DTAC (Waring, 2016) and in January 2016 it was reported DTAC had about 25 million mobile connections that included 2.1 million 4G connections, which represented 9% of DTAC's Thai user base. DTAC however, even as Thailand's second largest mobile Telco, failed to win a continuing 4G license in recent auctions but indicated it has enough spectrum until 2018 when DTAC's 1800 Mhz license expires. Additionally, DTAC will offer 4G services on its 2100-MHz spectrum in 2016 (Mongkolporn & Toomgum, 2015b). DTAC however, will not participate in the bidding for a new 900MHz license (Toomgum, 2016) as their present 2,100-MHz licenses will last until 2027. DTAC presently represents 14% of Norway's Telnor global revenue.

TRUE

TRUE in 2015 won two sections of spectrum in both the 900MHz and 1.8GHz bands, paying a record breaking THB116 billion ($US3.22 billion). TRUE's bid for the 4G 900 MHz spectrum in late 2015 was THB 76.3 billion ($US2.152 billion), or 491% above the reserve price (Phoosuphanusorn, 2016). TRUE, which is 18% owned by China Mobile, saw their mobile market share rise to 22% in quarter one in 2016, projecting as many as seven million 4G subscribers by the end of 2016 (Dhanananphorn, 2016).

In this high stakes environment, 69 million lines are prepaid representing 83.14% of the total subscribers. Another 13.99 million mobile are billed monthly (postpaid) representing 16.86% of the total (NBTC, 2015). The average revenue per user (ARPU) in Q3 of 2015 was THB 218 ($US 6.15) and the average number of minutes per number per month was 236. These numbers translate into Table 1's revenue for the three major Thai mobile providers AIS, DTAC, and TRUE for the years 2011–2015.

Telecom is fast becoming a dirty word for companies that want to become much more than providers of basic connections in a digital world in which technology is undermining traditional revenues (Thomas, 2015). Market competition of providers is increasing, so they need to develop and improve marketing strategies while implementing new generation technologies to keep pace with the demands of their customers and their devices, such as broadband smartphones. And to keep old customers, network upgrades to 4G are crucial as smartphone ownership has been shown to have a positive effect on customer trust towards telecom operators (de Reuver, Nikou, & Bouwman, 2015).

Mobile revenues are estimated at close to $US100 billion a month globally (Thomas, 2015) and in the US, the amount of venture capital investment in mobile more than doubled in 2014, reaching $US7.8 billion which represented 16% of all the money invested by venture capitalists during 2014 (Waters, 2015).

Combined with the newest generation of smartphones, users have more options than ever before, but in reality it all depends on network speed and capacity. Service providers are thereby forced to upgrade their capacities and expand their networks to maintain their competitive edge and attract new customers with customer satisfaction being a major factor contributing to the success of any organisation (Irfan, Shamsudin, & Hadi, 2016).

The purpose of this paper was therefore to investigate the relationships of the various antecedents on customer loyalty in the Thai mobile phone industry. A comprehensive model is proposed and tested empirically to see if the six antecedents identified below in recent industry literature fit with the empirical data or not.

Literature Review

An analysis of marketing literature has identified the major antecedents of *customer loyalty (CL)* as *customer satisfaction (CS)*, *perceived service quality*, *customer trust*, *corporate image*, *perceived value*, and *perceived switching costs* as the main elements (Akbar, 2013; Awwad, 2012; Qayyum, Ba Khang, & Krairit, 2013; Edward & Sahadev, 2011; Aydin & Özer, 2005, 2006; Lai, Griffin, & Babin, 2009).

Customer Loyalty

According to Aydin and Özer (2005), corporate image, perceived service quality, trust, and customer switching costs are the major antecedents of customer loyalty in the mobile phone industry. Also, there is a willingness to pay for things that are perceived to be of better quality while customer loyalty and perceived value are both drivers of company profitability (Pura, 2005). Also, customers' behavioral intentions show strong evidence of being influenced by service quality (Zeithaml, Berry, & Parasuraman, 1996).

Table 1
Revenue - Profit (loss) 2011–2015 (Unit: millions of THB).

		2011	2012	2013	2014	2015
AIS	Income	126,437	141,568	142,783	149,329	155,276
	Profit	22,218	34,883	36,274	36,033	39,152
DTAC	Income	79,199	89,497	94,617	90,415	87,753
	Profit	11,813	11,278	10,569	10,729	5,893
TRUE	Income	71,938	89,382	96,214	109,216	118,781
	Profit (loss)	(2,694)	(7,428)	(9,063)	1,425	4,412

Kim, Park, and Jeong (2004) investigated Korean mobile phone consumers and found that contractual cost, interpersonal relationships, and attractiveness of alternatives were key factors in determining customer retention. In Germany, for the newest generation of digital mobile customers, customer retention, customer loyalty, and customer satisfaction were stated as goals for telecommunication network operators on their way to superior economic success (Gerpott, Rams, & Schindler, 2001). In Turkey, after a review of 700 Istanbul mobile phone subscribers, Türkyilmaz & Özkan (2007) concluded that providers with limited resources should focus on improving customer satisfaction and customer loyalty. Therefore, customer loyalty is one of the critical components in helping a company achieve long-term success (Kuusik, 2007).

Customer Satisfaction

Factors used in the study of customer satisfaction and customer loyalty related to telecommunication include perceived value, trust, switching cost, customer satisfaction, corporate image, and service quality (Shamsundin, 2010). Earlier, Anderson, Fornell, and Lehmann (1994) indicated that the vast majority of all customer satisfaction studies viewed customer satisfaction as a post-choice evaluative judgment of a particular purchase event while the follow-up research from Johnson, Anderson, and Fornell (1995) concluded that customer satisfaction research has been of two types: one a transaction-specific satisfaction and another consisting of cumulative satisfaction.

In Pakistan, Khan, Rizwan, Islam, Aabdeen, and Rehman (2016) strongly suggested that brand equity dominates customer satisfaction which is in agreement with Lai et al. (2009), which indicated that customer satisfaction is an important determinant of customer retention/customer loyalty which, in turn, has a very strong effect on profitability. This is consistent with research by Oyeniyi and Abiodun (2010) on the Nigerian telecommunication sector which found that customer satisfaction positively affects customer retention.

A Swedish analysis of customer satisfaction indicated that the market's quality expectations of

a company's output positively affects a consumer's overall satisfaction with the company (Anderson et al., 1994) and firms that actually achieve high customer satisfaction also enjoy superior economic returns.

Perceived Service Quality

Perceived service quality was defined by Parasuraman, Zeithaml, and Berry (1988, p. 16) as "a global judgment, or attitude, relating to the superiority of the service," with service quality perceptions being one of the most debated topics in the services marketing literature which has proved to be a difficult concept to grasp (Brady & Cronin, 2001).

Research conducted by Amin, Ahmad, and Hui (2012) on Malaysian mobile operator's customer loyalty concluded that perceived service quality was found to be the most critical factor in affecting a user's customer loyalty.

Kuo, Wu, and Deng, (2009) analyzed Taiwanese university students and indicated that service quality positively influences both perceived value and customer satisfaction. In Greece, Santouridis and Trivellas (2010) determined that customer service, pricing structure, and the mobile operator's billing system are the key service quality variables on customer satisfaction, which significantly affects customer loyalty in a positive way.

Awwad (2012) used the American Customer Satisfaction Index (ACSI) model to study the Jordanian mobile phone sector and determined that customer expectations, perceived quality, and perceived value are crucial predictors to customer satisfaction, which ultimately result in customer loyalty. This was consistent with research by Akbar (2013) in Bangladesh who used three models to test the various hypotheses concerning customer loyalty of mobile phone users and Tung (2013) in China who also used the ACSI to test the perceived expectations, perceived quality, perceived value, perceived usefulness, and perceived ease of use, which were determined to have significant and positive effects on customer satisfaction with Chinese mobile service providers.

Perceived Value

Edvardsson, Johnson, Gustafsson, and Strandvik (2000) felt that perceived value played a significant role in customer loyalty and the willingness to re-purchase a product or service. Lai (2004) investigated SMS (Short Message Services) and also concluded that perceived value played an important role in customer satisfaction which was consistent with earlier research by Zeithaml (1988).

In Korea, Lee (2013) researched cellular phone service customer loyalty and indicated that consumers which have a high level of perceived value, the effect of service quality on customer satisfaction increases. In China, Lai et al. (2009) examined service quality, perceived value, corporate image, customer satisfaction, and customer loyalty and determined that both customer satisfaction and perceived value are significant determinants of loyalty.

Fornell, Johnson, Anderson, Cha, and Bryant (1996) used the ACSI to discuss perceived value and indicated that customer satisfaction played a more important role for products than for services and that this was the reason for customer satisfaction decline for services in the US. This is consistent with the systematic review of perceived value from Sánchez-Fernández and Iniesta-Bonillo (2007) which indicated that perceived value "implies an interaction between a consumer and a product."

Lin and Wang (2006) investigated customer loyalty in mobile commerce in Taiwan and discussed the importance of perceived value, trust, habit, and customer satisfaction and found that customer satisfaction played a crucial role in the relationship of the consumer's perceived value and customer trust to customer loyalty.

Customer Trust

From the 15,822 respondents of a Reader's Digest study (Branding-Institute CMR AG., 2015), it was found that only 32% of consumers trusted international companies and only 13% trusted advertising. This however soared to 78% (in Germany) when it comes to friends, colleagues, or their neighbors (word-of-mouth). This is consistent with the Nielsen Global Online Consumer Survey (25,000 Internet consumers from 50 countries), which determined that 90% trusted recommendations from their friends while 70% trusted consumer opinions posted online (The Nielsen Company, 2009). Vietnamese Internet consumers who posted their opinions online were trusted the most by other Vietnamese with an astounding 81%.

This confirms that the development of trust is particularly important within service industries because of the abstract nature of most service products (Coulter & Coulter, 2003). The main benefit of trust is customer loyalty, which in turn leads to a longer term relationship, higher income, and higher advocacy or word-of-mouth (Halliburton & Poenaru, 2010).

Trust is crucial in guaranteeing the success of business relationships, particularly those characterized by high degrees of risk, uncertainty, and vulnerability, like services (Halliburton & Poenaru, 2010), but from the 1,000 individual's surveyed in the UK, only 45% trust their mobile network operators and stated that front line employees and the marketing communications are the most important factors of trust (26% and 23%, respectively). Whereas when the same survey was conducted in the US, management policies and the front line employees were the top influencing factors of trust with 25% and 21%, respectively.

The above surveys confirm the work by Aydin and Özer (2005, 2006) concerning customer trust on customer loyalty. Rasheed and Abadi (2014) in their research on the Malaysian service and telecommunications sectors determined that service quality, customer trust, and customer perceived value can help explain customer loyalty. In South Africa, Chinomona and Sandada (2013) also confirmed that customer trust significantly affects mobile phone operator's customer loyalty which was also verified in Pakistan by Junaid-ul-haq and Nasir (2013). In the UK, Alsajjan (2014) indicated that mobile providers' customer loyalty depended on customer satisfaction and customer trust.

Liu, Guo, and Lee (2011) determined that attracting new customers is much higher than the cost of retaining old customers and keeping customers loyal is a crucial issue for service firms and consists of customer satisfaction and customer trust.

Corporate Image

Barich and Kotler (1991) developed a "system" for corporate "image management" and suggested that the term "image" is the sum of beliefs, attitudes, and impressions that a person or group has of an object, such as a company product. Nguyen and Leblanc (2001) determined that customer loyalty is higher when perceptions of both corporate reputation and image are strong.

Agyei and Kilika (2014) discussed the effects of corporate image on Kenyan mobile operator's customer loyalty and concluded that brand image and service qualities were the top two factors. Nguyen and Leblanc (2001) also concluded that corporate reputation and corporate image are extremely important in customer retention for service sectors such as telecoms, retail businesses, and educational institutions. Davies, Chun, Da Silva, and Roper (2002) concurred, and strongly indicated that corporate image is one of the most important factors affecting customer loyalty. In Spain, this was also the case as research by Calvo-Porral and Lévy-Mangin (2015) indicated that both service value and corporate image exerted the strongest influence on customer satisfaction and loyalty.

Perceived Switching Cost

Klemperer (1995) suggested that switching costs could contribute to brand loyalty with Porter's (1998) research later indicating switching cost was the amount a consumer incurs while changing service providers. Today however, due to carriers offering more and more options with devices, driving demand for services, switching costs might be a method to retain customers in older, less modern networks (Oyeniyi & Abiodun, 2010; Amarsy, 2015). The main objective of customer satisfaction programs therefore is to increase customer retention rates and switching costs play an important role (Lee et al., 2001).

Conceptual Framework

After a review of the literature and theory, the following hypotheses and conceptual model were developed (Figure 1). These include the causal relationships between customer loyalty, customer satisfaction, perceived service quality, customer trust, corporate image, perceived value, and perceived switching costs of Thai mobile phone users.

H1: Corporate Image has a direct and positive influence on Perceived Value

H2: Perceived Service Quality has a direct and positive influence on Perceived Value.

H3: Customer Trust has a direct and positive influence on Perceived Value.

H4: Perceived Switching Cost has a direct and positive influence on Perceived Value.

H5: Perceived Service Quality has a direct and positive influence on Customer Satisfaction.

H6: Corporate Image has a direct and positive influence on Customer Satisfaction

H7: Perceived Value has a direct and positive influence on Customer Satisfaction.

H8: Perceived Service Quality has a direct and positive influence on Customer Loyalty.

H9: Corporate Image has a direct and positive influence on Customer Loyalty.

H10: Perceived Switching Cost has a direct and positive influence on Customer Loyalty.

H11: Customer Trust has a direct and positive influence on Customer Loyalty.

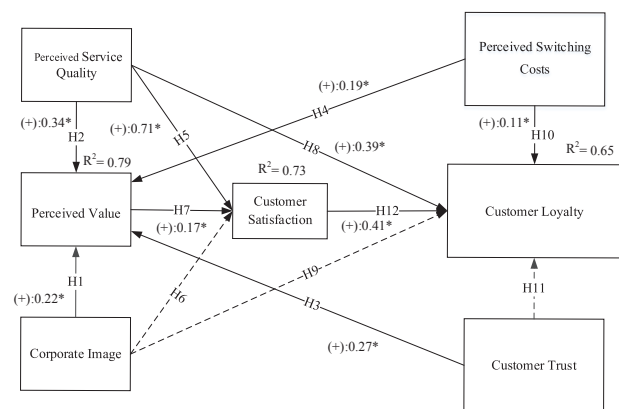H12: Customer Satisfaction has a direct and positive influence on Customer Loyalty.

Figure 1. *Conceptual model (Note: Latent variables are drawn as boxes).*

Methods

Sample and Data Collection

The population in this research was consumers who had a subscription to one of the three major Thai mobile carriers (AIS, DTAC, & TRUE), which at the time of the study represented 81.09 million active subscribers (Table 1), both prepaid and monthly/postpaid. These three groups from the companies AIS, DTAC and TRUE at the time of the research consisted of 67.43 million prepaid/refillable subscribers, as well as 13.67 million postpaid/monthly subscribers.

From the 7 latent variables in the model, 31 observed variables were analyzed. To determine if the sample size of 515 mobile customer users, selected by use of purposive sampling for the study was adequate, the researchers further confirmed this to be the case from previous researchers (Yamane, 1967; Israel, 1992; Schumacker & Lomax, 2004; Hair, Black, Babin, & Anderson, 2010), and used 15 survey samples for each of the 31 observed variables, including a 10% overhead.

Quantitative data collected from the questionnaires were analyzed using the Statistical Package for the Social Sciences (SPSS) for Windows v. 10 software program as well as the Analysis of Moment Structures (AMOS 21) as it has a unique graphical interface which was specifically designed to make fitting SEMs easier (Bacon, 2001). Purposive sampling was employed to collect questionnaires from each of the three Thai mobile phone carrier's prepaid and postpaid customers from various locations including educational institutions, private companies, real estate offices, government offices, and community and public transport places until the pre-determined 515 samples were obtained.

For the study, Cronbach's alpha (Cronbach, 1951) was used to evaluate the initial 40 samples which used a 7-point Likert (1932) scale survey rating matrix. The value of alpha (α) that are considered acceptable ranges in value from 0 to 1 and may be used to describe the reliability of factors extracted from multi-point formatted questionnaires or scales, with a reliability score of 0.70 or higher being considered a reliable score by many researchers (Hair et al., 2010). As the study's average value of the correlation coefficient was found to be 0.978, the results were deemed to be highly reliable.

Measurement

Measurement used in this study was developed from the literature and adjusted to suit the context of a mobile operator's network in Thailand. A 7-point Likert scale was used (Likert, 1932; Fornell et al., 1996) in the questionnaire, measuring the following variables:

Customer Loyalty research measured the three observed variables consisting of: (1) repurchase intention, (2) resistance to switching to competitor's product that is superior to the preferred vendor's product, and (3) willingness to recommend preferred vendor's product to friends and associates (Aydin & Özer, 2005; Pura, 2005; Zeithaml et al., 1996; Kim et al., 2004; Gerpott et al., 2001; Lee et al., 2001; Kuusik, 2007).

Customer Satisfaction research measured the four observed variables consisting of: (1) overall satisfaction with the service, (2) overall satisfaction with the network, (3) conformity with pre-purchase expectations of the customers, and (4) conformity with expectations (de Reuver et al., 2015; Johnson et al., 1995; Oyeniyi & Abiodun, 2010; Anderson et al., 1994; Lai et al., 2009).

Perceived Service Quality research measured the six observed variables consisting of: (1) quality of service in the calling service areas, (2) quality of value-added services, (3) after sales customer support and service, (4) convenience in procedures, (5) service quality awareness campaigns, and (6) a competitive pricing structure (Parasuraman et al., 1988; Brady & Cronin, 2001; Amin et al., 2012; Kuo et al., 2009; Santouridis and Trivellas, 2010; Awwad, 2012; Akbar, 2013; Tung, 2013).

Perceived Value research measured the five observed variables consisting of: (1) overall, the service has been valuable; (2) due to service quality, the service has been well worth the time, energy, and effort; (3) good service is provided for a reasonable price; (4) meets both high quality and low price requirements; and (5) meets the needs for a reasonable price (Edvardsson et al., 2000; Lai, 2004; ; Zeithaml, 1988; Lee, 2013; Fornell et al., 1996; Sánchez-Fernández & Iniesta-Bonillo, 2007; Lin & Wang, 2006).

Customer Trust research measured the four observed variables consisting of: (1) service ethics, (2) service reliability, (3) the cumulative service process, and (4) reliability of payment services and its related service quality (European Trusted Brands, 2015; The Nielsen Company, 2009; Coulter & Coulter, 2003; Halliburton & Poenaru, 2010; Aydin & Özer, 2005, 2006; Rasheed & Abadi, 2014; Chinomona & Sandada, 2013; Junaid-ul-haq & Nasir, 2013; Alsajjan, 2014; Liu et al., 2011).

Corporate Image research measured the five observed variables consisting of: (1) the service provider has a reputable image, (2) it is stable and firmly established, (3) it is focused on good corporate social responsibility (CSR), (4) leading enterprise in the telecommunications sector, and (5) it is innovative and forward–looking (Barich & Kotler, 1991; Nguyen & Leblanc, 2001; Agyei & Kilika, 2014; Nguyen & Leblanc, 2001; Davies et al., 2002).

Perceived Switching Cost research measured the four observed variables consisting of: (1) perceived uncertainty of costs, (2) perceived evaluation costs, (3) perceived learning costs, and (4) perceived benefit-loss costs (Porter, 1998; Klemperer, 1995; Oyeniyi & Abiodun, 2010; Amarsy, 2015; Lee et al., 2001).

Results

Respondents' Demographic Characteristics

Table 2 shows that of the 515 respondents in the study, 59.2% were female, and 40.8% were male. Also, 63.3% had obtained an undergraduate degree, while 51.1% were working in private companies. When the data was analyzed for the three carriers concerning the usage of either prepaid or postpaid payment methods, prepaid overwhelmingly becomes the payment method of choice as 83.1% indicated preference for it. AIS also confirmed its mobile carrier leadership and industry numbers from the survey with a 46.6% market share amongst the surveyed participants.

Table 2

Respondents' Demographic Characteristics

Demographic Profile	Category	Number of Respondents	Percent
Gender	Male	210	40.8
	Female	305	59.2
Age	15 – 24 years old	107	20.8
	25 – 34 years old	164	31.8
	35 – 44 years old	170	33.0
	45 – 54 years old	62	12.0
	55 years or older	12	2.3
Education	Secondary school	106	20.6
	University	326	63.3
	Graduate School	83	16.1
Occupation	Secondary School or University	100	19.4
	House Husband/House Wife	26	5.0
	Private Company Employee	263	51.1
	Government Officials/State Enterprise Employees	82	15.9
	Small Business Owners	44	8.5
Income per month ($1US=35.60)	10,000 THB per month or lower	90	17.5
	10,001 – 15,000/month	77	15.0
	15,001 – 20,000/month	85	16.5

Table 2 continued...

	25,001 – 30,000/month	75	14.6
	25,001 – 30,000/month	79	15.3
	30,000/month or over	109	21.2
Home Region	Bangkok	195	37.9
	Eastern Seaboard (Southeast)	48	9.3
	Outlying Bangkok Areas	44	8.5
	Western Thailand	29	5.6
	Northern Thailand	57	11.1
	Southern Thailand	53	10.3
	Northeast Thailand (Isan)	89	17.3
Mobile Phone Carrier	AIS	240	46.6
	DTAC	149	28.9
	TRUE	126	24.5
Payment Method	Postpaid	87	16.9
	Prepaid	428	83.1
Payment Period	1–3 years	174	33.8
	3–5 years	111	21.6
	5–7 years	46	8.9
	Over 7 years	184	35.7

Note. THB = Thai Baht which in February 2017 was $US 1 to THB 35.07.

Table 3 shows that the factors that affect Thai mobile phone customer loyalty includes customer satisfaction, perceived service quality, customer trust, corporate image, perceived value, and perceived switching costs. All had levels which indicated consumer sentiment as "quite agree" with an average of 4.45–5.30 on the survey's 7-point Likert scale (Best & Kahn, 1998; Likert, 1932). Also, there was a standard deviation of ≥ 1 for all factors.

Pearson Product-Moment Correlation Coefficient (PPMC)

Pearson's product-moment correlation coefficient (r) was used to calculate the direction and strength between the constructs. Table 4 shows the results of the testing on the seven variables in which, r, can take a range of values from –1 to +1. The sign of the correlation coefficient indicates the direction of the relationship, while the magnitude of the correlation (how close it is to –1 or +1) indicates the strength of the relationship.

Table 3
Mean, Standard Deviation and Survey Comments

Customer Loyalty Factors	Mean	Std. Deviation	Survey Comments
Customer Satisfaction	4.83	1.21	Quite agree
Perceived Service Quality	4.66	1.10	Quite agree
Customer Trust	4.64	1.23	Quite agree
Corporate Image	5.00	1.11	Quite agree
Perceived Value	4.65	1.15	Quite agree
Perceived Switching Cost	4.73	1.01	Quite agree

- −1: perfectly negative linear relationship
- 0: no relationship
- +1: perfectly positive linear relationship

The strength can be assessed by these general guidelines:

- $.1 < |r| < .3$ … small / weak correlation
- $.3 < |r| < .5$ … medium / moderate correlation
- $.5 < |r|$ ……… large / strong correlation

Results from the study shown in Table 4 indicate the positive relationships. Additionally, the variables are most correlated at the statistically significant level of $p < 0.01$.

Measures of the Model Fit

Figure 2 shows the model's path analysis after adjusting the model to determine the consistency of models with the empirical data which was found to be consistent through the assessment model. The data criteria are shown in Table 5.

Table 4
Pearson Product Moment Correlation Coefficient

| Variables	Customer Loyalty	Customer Satisfaction	Perceived Service Quality	Perceived Value	Corporate Image	Trust	Perceived Switching Cost
Customer Loyalty	1.00						
Customer Satisfaction	0.773**	1.00					
Perceived Service Quality	0.773**	0.874**	1.00				
Perceived Value	0.713**	0.770**	0.845**	1.00			
Corporate Image	0.672**	0.731**	0.815**	0.798**	1.00		
Trust	0.658**	0.736**	0.836**	0.814**	0.753**	1.00	
Perceived Switching Cost	0.552**	0.555**	0.618**	0.660**	0.609**	0.556**	1.00

Note. ** $= p < 0.01$
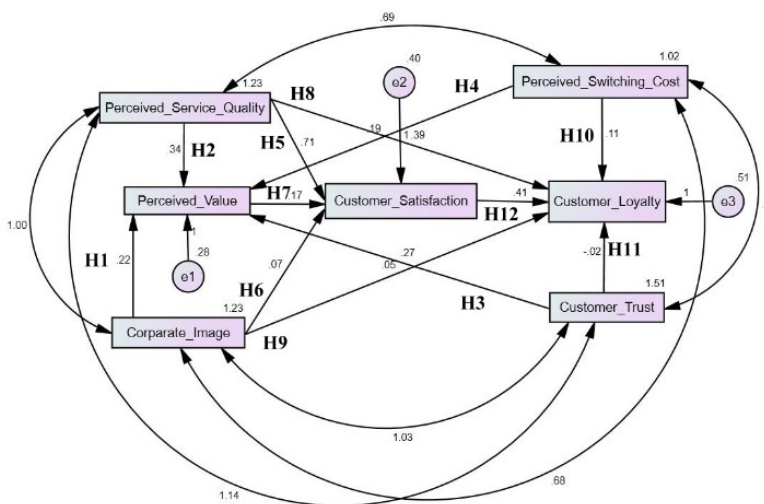
Figure 2. *Path diagram for the model with standardized results shown.*

Note. Quantities close to the variables are their squared multiple correlations. Quantities near paths are standardized loadings or correlations.

Table 5
Theory Consistency Validation Criteria for the Empirical Data

Criteria Index	Criteria	Values	Results	According to:
Chi-square: χ2	ns.(*p*>0.05)	.298	Consistent/pass	(Hair et al., 2010; Bollen, 1989)
Relative Chi-square: χ2/df	≤ 3.00	1.227	Consistent/pass	(Hair et al., 2010)
Goodness of Fit Index: GFI	≥ 0.90	.998	Consistent/pass	(Hair et al., 2010; Jöreskog & Sörbom, 1979; Tanaka & Huba, 1985)
Adjusted Goodness of Fit Index: AGFI	≥ 0.90	.981	Consistent/pass	(Schumaker & Lomax, 2004)
Comparative Fit Index: CFI	≥ 0.90	1.000	Consistent/pass	(Hair et al., 2010; Bentler, 1990)
Normed Fit Index: NFI	≥ 0.90	.999	Consistent/pass	(Bentler & Bonet,1980; Bollen,1989)
Pearson Product–Moment Correlation Coefficient (PPMC)	+1	+1 to -1	Consistent/pass	
Root Mean Square Error of Approximation: RMSEA	≤ 0.08	.021	Consistent/pass	(Hair et al., 2010; Browne & Cudeck, 1993; Hu & Bentler, 1999)

Parameter Estimation of the Model

Regression weights were used for hypotheses testing when it was necessary to examine the extent of effects of exogenous latent variables on endogenous latent variables. An absolute fit measure was used to determine the degree to which the structural and measurement models fitted the sample data. Out of the 12 hypotheses in the study, nine were accepted and three were rejected.

In Figure 2 and Table 6 the standardized regression weights are shown. From this, the frequencies of the customer loyalty score along with values one standard deviation above and below the mean are indicated with a significant statistical relationship between the variables indicated at 0.001 (*** *p*<0.001). Critical ratios (t-value) more than 1.96 are significant at the 0.05 level. Results indicated that:

H1: There was a significant causal relationship between Corporate Image and Perceived Value. The results indicated that Corporate Image has a direct and positive effect on Perceived Value on the standardized regression weight scale as indicated by estimate=0.222, CR=5.828, and *** *p*<0.001.

H2: There was a significant causal relationship between Perceived Service Quality and Perceived Value. The results indicated that Perceived Service Quality has a direct and positive effect on Perceived Value on the standardized regression weight scale as indicated by estimate=.343, CR=7.506, and *** *p*<0.001.

H3: There was a significant causal relationship between Customer Trust and Perceived Value. The results indicated that Customer Trust has a direct and positive effect on Perceived Value on the standardized regression weight scale as indicated by estimate=0.268, CR=7.550, and *** *p*<0.001.

H4: There was a significant causal relationship between Perceived Switching Cost and perceived value. The results indicated that Customer Trust has a direct and positive effect on Perceived Value on the standardized regression weight scale as indicated by estimate=.194, CR=6.411, and *** *p*<0.001.

H5: There was a significant causal relationship between Perceived Service Quality and Customer Satisfaction. The results indicated that Customer Satisfaction has a direct and positive effect on perceived value on the standardized regression weight

scale as indicated by estimate=.712, CR=13.650, and *** *p*<0.001.

H6: Corporate image influences customer satisfaction—Rejected

H7: There was a significant causal relationship between Perceived Value and Customer Satisfaction. The results indicated that Perceived Value has a direct and positive effect on Perceived Value on the standardized regression weight scale as indicated by estimate=0.175, CR=3.644, and *** *p*<0.001.

H8: There was a significant causal relationship between Perceived Service Quality and Customer Loyalty. The results indicated that Perceived Service Quality has a direct and positive effect on Customer Loyalty on the standardized regression weight scale as indicated by estimate=0.388, CR=5.332, and *** *p*<0.001.

H9: Corporate Image has a direct and positive influence on Customer Loyalty—Rejected

H10: There was a significant causal relationship between Perceived Switching Cost and Customer Loyalty. The results indicated that perceived switching cost has a direct and positive effect on Customer Loyalty on the standardized regression weight scale as indicated by estimate=0.112, CR=2.725, and ** *p*<0.01.

H11: Customer Trust influences Customer Loyalty—Rejected

H12: There was a significant causal relationship between Customer Satisfaction and Customer Loyalty. The results indicated that Customer Satisfaction has a direct and positive effect on Customer Loyalty on the standardized regression weight scale as indicated by estimate=0.406, CR=8.182, and *** *p*<0.001.

Table 6
Relative Influence of Items (Standardized Regression Weights) Used to Access Customer Loyalty (N=515) Results After Adjusting the Model

Correlating Variables Path	Estimate	S.E.	C.R. (t-value)	P-Value	Significance
H1: Perceived Value<---Corporate Image	0.222	.038	5.828	***	supported
H2: Perceived Value<---Perceived Service Quality	0.343	.046	7.506	***	supported
H3: Perceived Value<---Customer Trust	0.268	.035	7.550	***	supported
H4: Perceived Value<---Perceived Switching Cost	0.194	0.030	6.411	***	supported
H5: Customer Satisfaction<---Perceived Service Quality	0.712	0.052	13.650	***	supported
H6: Customer Satisfaction<---Corporate Image	0.073	0.046	1.580	0.114	rejected
H7: Customer Satisfaction<---Perceived Value	0.175	0.048	3.644	***	supported
H8: Customer Loyalty<---Perceived Service Quality	0.388	0.073	5.332	***	supported
H9: Customer Loyalty<---Corporate Image	0.055	0.052	1.052	0.293	rejected
H10: Customer Loyalty<---Perceived Switching Cost	0.112	0.041	2.725	0.006**	supported
H11: Customer Loyalty<---Customer Trust	-0.022	0.048	-0.453	0.650	rejected
H12: Customer Loyalty<---Customer Satisfaction	0.406	0.050	8.182	***	supported

Note. ** p < 0.01, *** p < 0.001, Critical ratios (t-values) more than 1.96 are significant at the 0.05 level.

Table 7 shows the direct effect, indirect effect, and total effect of each construct with the sum of direct and indirect effects is referred to as the total effect (Zou & Fu, 2011; Bollen, 1987). The "p" value is the "level of significance" with a $p<0.05$ indicating that the probability that the result is observed due to chance is 5% (a "false positive" result). Conventionally, the p value of 5% ($p = 0.05$) or 1% ($p = 0.01$), which means 5% (or 1%) chance of erroneously reporting a significant effect is accepted.

Table 6 shows perceived value is influenced by the direct positive recognition of service quality the most due to the value of 0.343 and has no significant indirect influence as well as the total effect is 0.343.

Customer satisfaction was influenced by a direct positive (DE = 0.712) and an indirect but positive influence (IE = 0.60) by perceived service quality the most and the total effect is influenced by 0.772.

Customer loyalty was influenced by a direct positive relationship from customer satisfaction the most (DE = 0.406) and customer loyalty was additionally influenced by an indirect positive relationship by perceived service quality with the total effect is influenced by 0.313. In conclusion, perceived value, customer satisfaction and customer loyalty are influenced by the more indirect influence of variables that are most predictive.

And the indirect effect of perceived service quality with customer satisfaction (IE = 0.60), perceived service quality with customer loyalty (IE = 0.313) and the perceived value with customer loyalty (IE = 0.071) were statistically significant when greater than 0.05 (Pedhazur, 1982; Lau, Wong, & Eggleton, 2008).

Table 7

Direct Effect (DE), Indirect Effect (IE), and the Total Effect (TE) Analysis Results

Dependent Variables	Effect	Predictor/Independent Variable					
		Customer Trust	Perceived Switching Cost	Corporate Image	Perceived Service Quality	Perceived Value	Customer
Perceived Value	DE	0.268	0.194	0.222	0.343	0.000	0.000
	IE	0.000	0.000	0.000	0.000	0.000	0.000
	TE	0.268	0.194	0.222	0.343	0.000	0.000
Customer Satisfaction	DE	0.000	0.000	0.073*	0.712	0.175	0.000
	IE	0.047**	0.034**	0.039*	0.060***	0.000	0.000
	TE	0.047	0.034	0.112*	0.772	0.175	0.000
Customer Loyalty	DE	-0.022*	0.112	0.055*	0.388	0.000	0.406
	IE	0.019*	0.014**	0.045*	0.313***	0.071***	0.000
	TE	-0.003*	0.126	0.100*	0.701	0.071	0.406

Note. * = p value > 0.05 from Table 6 and not sig. ** = Indirect value < 0.05 (Indirect) not Sig. *** = Indirect value > 0.05 (Indirect) Sig.

Comparison of the Effects of Variables

Table 8 shows that the variable perceived service quality influences positively perceived value more than customer trust, corporate image, and perceived switching cost as shown by the value of 0.328.

The total value of R^2 for perceived value is equal to 0.791, while the variable perceived service quality positively influences customer satisfaction more than perceived value as indicated by 0.651. The total value of R^2 for customer satisfaction is equal to 0.729, while the variable customer satisfaction positively influences customer loyalty more than perceived service quality and perceived switching cost as indicated by 0.403. The total value of R^2 for customer loyalty is equal to 0.654. Other variables have minimum influence because the p value > 0.05 as shown in Table 8.

Table 8 *Standardized Regression Weights*

Relationship between variables	Estimate
Perceived Value<---Corporate Image	0.213
Perceived Value<---Perceived Service Quality	0.328
Perceived Value<---Customer Trust	0.285
Perceived Value<---Perceived Switching Cost	0.169
Customer Satisfaction<---Perceived Service Quality	0.651
Customer Satisfaction<---Corporate Image	0.067*
Customer Satisfaction<---Perceived Value	0.167
Customer Loyalty<---Perceived Service Quality	0.352
Customer Loyalty<---Corporate Image	0.050*
Customer Loyalty<---Perceived Switching Cost	0.093
Customer Loyalty<---Customer Trust	−0.022*
Customer Loyalty<---Customer Satisfaction	0.403

Note.

Perceived Value	Customer Satisfaction	Customer Loyalty
R^2= 0.791	R^2= 0.729	R^2 = 0.654

* = No influence *p* value > 0.05

The Hypothesis Testing

Table 9 shows that the hypotheses H1, H2, H3, H4, H5, H7, H8, H10, and H12 have a direct positive influence and are consistent with the research hypotheses, while H6, H9, and H11 do not have any direct positive influence.

Table 9
The Hypotheses Testing Results

Hypotheses	Hypotheses Testing Results	Consistency
H1	Direct positive influence	Consistent
H2	Direct positive influence	Consistent
H3	Direct positive influence	Consistent
H4	Direct positive influence	Consistent
H5	Direct positive influence	Consistent
H6	No direct positive influence	Not consistent
H7	Direct positive influence	Consistent
H8	Direct positive influence	Consistent
H9	No direct positive influence	Not consistent
H10	Direct positive influence	Consistent
H11	No direct positive influence	Not consistent
H12	Direct positive influence	Consistent

Discussion

The results of this research from the mobile phone operator customers is that all the six factors (customer satisfaction, perceived service quality, customer trust, corporate image, perceived value, and perceived switching costs) which were tested concerning customer loyalty had a positive relationship.

Qayyum et al. (2013) in Pakistan which found that customer satisfaction, perceived switching costs, service quality, and perceived value (Lai et al., 2009) all had a positive and significant relationship with customer loyalty. Further analysis concluded that Pakistan's mobile phone operators should invest more in rural areas to enhance and expand their services, which seems to be mirrored by the recent strategy of Thai mobile phone operators at acquiring some of the most expensive 900MHz spectrum in the world (Yalavarthy, 2015; Phoosuphanusorn, 2016).

The hypothesis testing also found that H1, H2, H3, and H4 had direct positive effect positive on perceived value; H5, and H7 had significant direct positive relationships with customer satisfaction; and H8, H10, and H12 influences, direct positive to customer loyalty but H6, H9, H11, had no influence and no statistical significance. The index for determining the suitability of the model fit was consistent with empirical data.

From this study, it was also found that the group is highly correlated with customer satisfaction, perceived service quality, and perceived value, with perceived value able to predict variation occurrence with 79.1%, customer satisfaction was able to predict variation occurrence with 72.9%, and customer loyalty able to predict variation occurrence with 65.4%. Perceived value, customer satisfaction, and customer loyalty are influenced by the more indirect influence of variables that are most predictive.

Furthermore, research showed that to make the business of providing mobile services a competitive and sustainable business in the long term, it is necessary to develop and improve marketing strategies to rekindle and attract new users to adopt mobile services. Additionally, care and attention to the customer needs to be increased to maintain and retain loyalty to the service provider.

The study's research showed the customer's willingness to continue using a service and not switch to another carrier and use word of mouth to tell friends, colleagues, and others require customer satisfaction, perceived service quality, perceived value, customer trust, corporate image, and the high cost of switching to another carrier. The study also found that customer satisfaction with perceived service quality, perceived value, and the perceived switching costs influence positively, both directly and indirectly, the relationship with customer loyalty.

Mobile carrier networks need to give importance and focus on responding to what consumers want most so customers can evaluate what value they receive for what they pay. Consumer service quality entails the ability to recognize the performance of the service providers and the signal quality which must be clear while also making the customer experience easy to use and learn. Cost must be justified and the carrier must quickly fix any problems which occur. Corporate image has no relationship to customer loyalty.

Finally, according to Aydin and Özer (2006), Amin et al. (2012), and Qayyum et al. (2013), corporate image has a positive influence but has no relationship with customer loyalty which is why the carrier must develop their corporate image. Efficiency, corporate image, service quality, and after-sales service needs to be excellent. There must also be special attention

paid to CSR which helps give greater customer trust leading to higher customer loyalty.

The results of this study can be applied to guide the development of customer satisfaction, perceived service quality, perceived value, and perceived switching costs of the service provider to the mobile user. Also, it can be used to help focus on corporate image and customer trust which makes the company quick to change when needed and stable and strong. Future research should focus on other factors having an impact on mobile phone customer loyalty including motivation, expectations, and customer complaints, political, cultural, and outside economic influences which will help mobile phone carriers develop and apply services of high quality and meet the needs of their consumers better.

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