

## Factors influencing business of mobile telecommunication service providers in Vietnam

Ha Thanh Hai<sup>a</sup>, Khong Sin Tan<sup>b\*</sup> and Yee Yen Yuen<sup>c</sup>

<sup>a</sup>European University, Malaysia

<sup>b,c</sup>Multimedia University, Malaysia

### CHRONICLE

#### Article history:

Received: November 26, 2017

Received in revised format:

March 31, 2018

Accepted: April 4, 2018

Available online:

April 5, 2018

#### Keywords:

Telecommunication

Smart Phone

Vietnam

### ABSTRACT

According to the Ministry of Information and Communications in Vietnam, as of November 2015, the number of mobile subscribers is over 120 million ones, accounting for over 86% of the total number of telephone subscribers. With a total population of over 92 million Vietnam citizens, a stable national economy and a large populations of young consumers in the country, mobile communication industries still have a huge potentials for future development. Telecommunication service providers in Vietnam are facing fierce competition. Subscribers are expecting OTT (Over the Top) applications, good quality service and handset subsidy. This study investigated whether legal frameworks, OTT applications, quality of service and handset subsidy are important components of mobile telecommunication service in Vietnam. This study used quantitative method to distribute surveys to mobile subscribers. Findings found that all four factors significantly influence mobile business in Vietnam. Thus, telecommunication service providers in Vietnam must continuously innovate to enhance operational competitiveness, improve business efficiency, expand business scale, and improve its position in the market in order to ensure sustainable development. Moreover, Vietnamese government needs to develop a legal framework to help mobile telecommunication service providers enhance the common interests and benefits of the entire society.

© 2018 by the authors; licensee Growing Science, Canada

## 1. Introduction

At present, Vietnam has had over 120.6 million mobile subscriptions with the rate of 133 subscriptions per 100 people. 3G services have grown significantly and it has made up for the revenue increase of mobile telecommunication service providers. The proportion of Internet users in Vietnam has reached 52% of Vietnamese population by the end of November 2015. Of these, 36.2 million are mobile broadband Internet subscribers, which is equivalent to 40.1 subscribers per 100 people. According to the subscription statistics, Viettel ranked first on the mobile market, following by MobiFone and VinaPhone (VNTA of MIC, Mar 2014). However, in recent years, the total revenue of telecommunication companies in Vietnam had been significantly reduced from US \$6.51b in 2012 to only US \$6.47b in 2013, the mobile telecommunication service providers had been losing billion dong in revenue to the Over the Top (OTT) applications such as new, cheaper or free messaging services, location-based services (MIC's 2013 annual report).

\* Corresponding author.

E-mail address: [kstan@mmu.edu.my](mailto:kstan@mmu.edu.my) (K. Sin Tan)

SMS services which traditionally accounted for around 80% of overall messaging revenue, was started to decline by 2015, accounted for only around 50% of the revenues now. The mobile telecommunication service providers complained that they lost their revenues due to OTT applications. Each of them suffered lost revenue of US \$200-300mil/year due to OTT applications. In compensation to such loss, they have no choice other than increase their tariff for 3G data access for more than 50% in 2013 – 2015. This strategy received negative feedbacks and responses from the subscribers as they claimed that it is an unfair treatment as the market is dominated by inefficient state-owned service providers. The mobile subscribers had subsequently urge the government to implement certain legal framework in order such as privatization of state-owned service providers or number portability scheme, which allow the users to easily change their existing service provider without changing their mobile phone numbers (MIC's 2014 annual report). Moreover, the emergence of Internet protocol (IP) technology has transformed the business model of telecommunication companies in Vietnam in such a way that voice call distance, for example, is no longer proportional to voice call cost. With the massive adoption of Skype - today's largest carrier of long distance traffic - traditional communication service providers (CSPs) are increasingly difficult to offer cost competitive telecommunication services.

Large operation and business support system (OSS/BSS) were built to introduce new offerings in telecommunication industries. However, traditional CSPs are burdened with duplication in their OSS/BSS environments and a huge portfolio of often overlapping products and services. In addition, their ability to compete was impeded by different customer care systems with fragmented databases of record, multiple billing systems, and silo-based activation systems, resulting in a lack of visibility, high costs and inferior quality of telecommunication services.

The Vietnam government has recently announced that all service providers should meet the quality of service (QoS) requirements. For telecommunication industry, the most important dimensions of quality are availability, reliability, security, flexibility or choice, simplicity and assurance (Mobile Subscriber Satisfaction – Nielsen Report in March 2014). As prices of premium smartphones started increasing, subsidies started threatening operator margins.

In order to ensure that telecommunication industry can achieve competitive advantage in competitive business environment, this study intended to investigate the following objectives:

1. To determine how legal telecommunication framework influences mobile telecommunication service providers,
2. To identify how OTT applications influence mobile telecommunication service providers,
3. To determine how service quality influences mobile telecommunication service providers,
4. To determine how handset subsidy influences mobile telecommunication service providers.

## **2. Literature Review**

### *2.1 The Legal Telecommunication Framework*

In recent years, Vietnam has issued several breakthrough directives to promote the development of technology. Some policies have been institutionalized, including Decision No. 1755/QĐ-TTg dated September 22, 2010 of the Prime Minister “Approving the Scheme to Early Make Vietnam a Country Strong in Information and Communication Technologies.” This decree sets out the country's vision and targets of becoming a leading ICT nation by 2020. Decree No.25/2011/ND-CP provides enterprise regulations in the field of telecommunications. Pursuant to this new decree, an organization or individual who owns over 20 percent of the charter capital or stake in one telecommunications company will not be allowed to hold more than 20 percent of the charter capital or stake in other telecommunications firms operating in the same services. In compliance to this government decree, three major mobile telecommunication service providers (Viettel, Mobifone and Vinaphone), which

own more than 90% of the current market share, are required to revise their national service quality standards, number portability and privatization strategy.

## 2.2 *Over-The-Top (OTT) Service*

A key development in this mobile market is the rise of Over-The-Top (OTT) service providers. For example, both mobile VoIP apps and mobile Instant Messaging (IM) are OTT services, representing a potential threat to mobile operators' call revenues. Other forms of messaging, such as SMS, are increasing in use as well, particularly free messaging services offered by social networks and free apps such as Whatsapp. The trend towards OTT applications has been accelerated by changing service expectations. If a Skype audio or video call fails, the customer does not expect any support—after all, the call is either free or very low cost and the quality is “best effort.” However, if a carrier call fails, chances are the customer will contact customer service. The erosion of carrier traffic by Skype clearly illustrates what customers prefer. Premium, yet free, Skype services accelerate user acceptance even if user experience varies due to the quality of service.

Striking the right balance between CSP internal cost savings and OSS/BSS modernization is a significant challenge for traditional CSPs in the current environment. They are not only experiencing revenue erosion from both voice and messaging, but also application revenue bypass through Apple and Google or other OTT providers. At the same time, they are facing rising costs with OSS/BSS consolidation and IP multimedia subsystem and wireless upgrades.

Yet even though most CSPs will likely find an opportunity to rationalize their traditional telecom portfolio, the CSPs that aspire to become full service providers will want to expand their offerings portfolio into new areas such as the cloud, machine-to-machine (M2M) etc. This underlines the importance of both legacy portfolio consolidation and OSS/BSS flexibility. The next generation “agile” OSS/BSS environment needs to support both legacy and new offerings, which often branch well beyond pure telecom.

## 2.3 *Service Quality*

Parasuraman et al. (1985) described service quality as an elusive construct, formed by three unique characteristics - intangibility, heterogeneity, and inseparability of production and consumption. (Brady & Cronin Jr, 2001) of maintained that despite a number of service quality studies, there is no consensus on the conceptualization and measurement service quality, the dimensions of service quality, and the content of the dimensions. Service quality is described as a form of attitude, as it is a global judgment relating to the superiority of the service (Carman, 1990; Cronin Jr & Taylor, 1992; Parasuraman et al., 1985; Qureshi et al., 2014; Abdollahi et al., 2017). However, service quality is not equivalent to satisfaction (Bolton & Drew, 1991; Cronin Jr & Taylor, 1992; Parasuraman et al., 1985). Service quality and customer satisfaction are distinct in two aspects. First, service quality is a long-run overall evaluation, compared to customer satisfaction, which is a specific transaction measure (Bitner, 1990; Bolton & Drew, 1991; Parasuraman et al., 1985). Second, although service quality and customer satisfaction may both result from the comparison of customer expectations with the service performance (the disconfirmation paradigm), expectations are viewed as customers' predictions about service performance in the satisfaction literature, whereas expectations are viewed as the desires or wants of customers in the service quality literature (Parasuraman et al., 1985).

Traditional CSPs inherited expectations for higher quality in addition to the higher costs they were already experiencing compared to new providers like Skype. So, it's both the complexity of traditional CSP service structures and higher quality expectations from consumers that are making it more difficult for traditional CSPs to compete with new entrants, especially when it comes to overlapping offerings.

## 2.4 Handset Subsidy

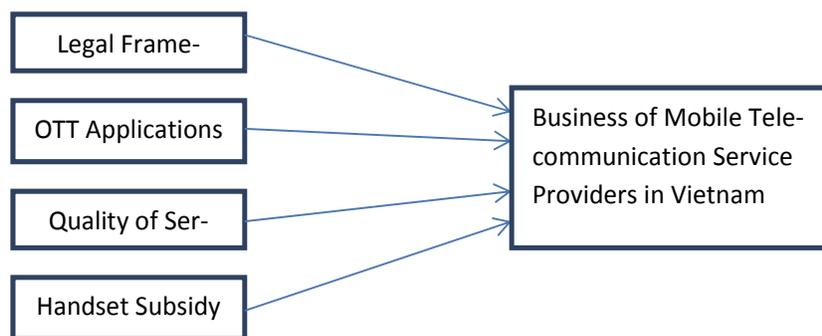
In the past decade, one of the key drivers of the mobile communication sector is the rapid adoption of premium smart phones. The most popular form of selling smart phones in developed countries was using smart phone subsidies where the mobile operators offer customers with smart phones at low upfront cost and customers repay the price of the handset monthly throughout the term of the contract. The advantages of offering subsidies were clear: to ease the customer burden of paying a high price upfront for the smart phone and to increase smart phone adoption resulting in higher data revenues.

But as prices of premium smartphones started increasing, subsidies started threatening operator margins. Operators were left with no other option but to increase mobile plan tariffs and the handset subsidies became, in the words of Illiad's founder Xavier Neil, "bad loans" where consumers end up paying back in the form of hidden fees and higher contract prices that amounted to interest rates of 300 to 400 percent in a two-year contract. A recent report done by the Organization for Economic Co-Operation and Development (OECD) on "Mobile Handset Acquisition Models" concluded that in cases where operators were allowed for the possibility of purchasing the smartphone device independently, the bundled handset discount plans represented a higher total cost for the consumers when accounted for throughout the length the contract. This muddied the waters as clarity in tariff plans and transparency towards customers started diminishing. Although removal of handset subsidies seems to be a valid argument for the operator community, it is not necessarily easy to implement.

Although the advantages of removing handset subsidies in developed mobile markets are apparent, mobile operators still need to take that decision based on the very local circumstances, such as general economic conditions, competition moves, demands for transparency in tariffs, popularity of bundled prices, and specific customer needs. It would a great challenge for telecommunication companies to completely take away device subsidies especially in developing countries with temporary societal economic downturns. Once the customer is educated and empowered with transparent plans and tariffs, he/she will increasingly be less prone to opt for "free" smartphones.

## 3. Methodology/Materials

Fig. 1 shows the proposed research framework for this study. The four hypothetical variables that may influence mobile telecommunication service providers in Vietnam are legal framework, OTT applications, quality of service and handset subsidy.



**Fig. 1.** Research Framework

### 3.1 Research Hypotheses

Research hypotheses are developed to test the relationship between elements and the development strategy.

H1: There is a relationship between legal framework and the business of mobile telecommunication service providers in Vietnam.

H2: There is a relationship between OTT applications and the business of mobile telecommunication service providers in Vietnam.

H3: There is a relationship between quality of service and the business of mobile telecommunication service providers in Vietnam.

H4: There is a relationship between handset subsidy and the business of mobile telecommunication service providers in Vietnam.

### 3.2 Research Methodology

This survey used random sampling method. Respondents who possess handphoned were requested to participate in this study. The survey was conducted in 3 biggest cities of Vietnam (Hanoi, Danang and Ho Chi Minh City) with 250 eligible responded to this study.

## 4. Results and Findings

### 4.1 Respondents' profile

Based on Table 1, there are 114 male respondents (65.6%) and 86 female respondents (34.4%) in this study.

**Table 1**  
Demographic Profile

Gender	Frequency	Percent
Male	114	65.6
Female	86	34.4
<b>Age</b>		
18 - 24	29	11.6
25 - 30	94	37.6
31 - 40	96	38.4
Over 40	31	12.4
<b>Monthly Phone Spending (VND)</b>		
<100,000	28	11.2
101,000 – 200,000	99	39.6
201,000 – 300,000	64	25.6
>300,000	59	23.6
<b>Types of Subscribers</b>		
Postpaid	77	30.8
Prepaid	173	69.2
<b>Service Providers</b>		
Viettel	107	42.8
Vinaphone	87	34.8
Mobiphone	78	31.2
Vietnamobile	44	17.6
G-Mobile	5	2.0
<b>Number of Mobile Providers Used</b>		
1	179	71.6
2	65	26.0
3	6	2.4
>3	0	0.0

Most of the respondents aged between 31-40 years old (96 respondents or 38.4%) while respondents aged between 25-30 covered 37.6% (94 respondents). There are only 77 respondents who are post-paid subscribers which are accounted for 30.8% while the rest 69.2% (173) are pre-paid subscribers. Out of 250 respondents, there are 107 respondents (42.8%) using Viettel Mobile, 87 respondents (34.8%) using Vinaphone, 78 respondents (31.2%) using Mobiphone, and 44 respondents (17.6%) using Vietnmobile and 5 respondents (2.0%) using G-Mobile. Among these people, 65 respondents use 2 service providers while there are only 6 people use three service providers and no respondent use more than three mobile telecommunication service providers. Another important issue should be considered in this survey is the money that people spend monthly on mobile phone. The usage is divided into four threshold with the bottom threshold is below VND 100,000 and the ceiling threshold is above VND 300,000. Of 250 respondents, 28 respondents spend less than VND 100,000 on mobile phone cost while 65.2% of respondents spend between VND 101,000 and 200,000 for mobile phone per month. 59 respondents spend more than VND 300,000 on mobile phone per month.

#### 4.2 Mean and Standard Deviations of Variables

Table 2 showed the values of mean and standard deviations of all items in this study.

**Table 2**  
Mean and Standard Deviations

Items	Mean	Std. Dev.
The legal framework in Vietnam support to create a competitive mobile telecommunication service market.	2.14	.974
Although the mobile telecommunication service is considered as politically sensitive sector in Vietnam, the mobile telecommunication service provider will be more developed when they are privatized.	3.55	.960
The mobile telecommunication service provider will be more developed when subscribers are allowed to change the network without changing their subscriber numbers.	3.01	.998
The government manages well its policy to protect the right of the subscribers.	3.62	1.016
The government policy encouraged the investment in mobile telecommunication infrastructure & services (network expansion, sale & marketing investment, new service development)	3.76	.974
I am satisfied with the quality of the existing mobile telecommunication network (call successful rate, call dropping rate, voice quality, network coverage).	3.69	.960
I am satisfied with the promotion plans implemented by the existing mobile telecommunication service provider.	3.62	.765
I am satisfied with the tariff plans provided by the mobile telecommunication service providers since it is adaptive to my needs.	3.64	.811
I am satisfied with the convenience to access to the services provided by mobile telecommunication service provider (registration, change the plan, flag shop).	3.71	.841
I am satisfied with the customer care services provided by the existing mobile telecommunication service provider.	3.12	.718
My monthly expense for mobile service reduces by using the OTT application (such as Viber, Zalo, Facebook messenger, skype).	3.80	.776
I feel comfortable with the advertisement or spam caused by OTT applications.	3.60	.768
I purchase my smart phone and using data service from the mobile telecommunication service provider mainly because I want to use OTT applications.	3.61	.788
I am willing to accept the increase of the data service tariff (mainly in order to access to the internet by the mobile phone) from the mobile telecommunication service provider in compensation to my OTT usage.	3.76	.847
I will not use OTT application if the mobile telecommunication service operators implement more attractive bundle tariff plans (all voice, data and SMS services with fixed lump sum price).	2.17	.914
I do not receive enough information regarding to the handset subsidy plans given by the mobile telecommunication service provider.	3.84	.899
I feel the handset subsidy plan is not interested because I want to be able to change my handset at any time.	3.77	.942
I feel the handset subsidy plan is not interested when the mobile telecommunication service provider ask the subscriber to pay for large amount of fee in advance.	3.28	.936
I am not interested in handset subsidy plans because I am worry that my personal information can be gathered by the mobile telecommunication service operator through specific applications installed on its subsidy phone.	3.06	.921
I feel inconvenient when the subsidized handset could be used in a specific network only.	3.24	.982

#### 4.2 Reliability Analysis

Table 3 showed the Cronbach's Alpha values for the dependent variables and four independent variables. All Cronbach's Alpha values for all variables are above 0.70 and this indicated good internal reliability (Nunnally, 1978; Peterson, 1994; U Sekaran, 2000; Uma Sekaran & Bougie, 2010).

**Table 3**  
Croanbach's Alpha Values

No	Item	Alpha's values
Mobile Business	5	0.724
Legal Framework	5	0.750
OTT Applications	5	0.859
Quality of Service	5	0.836
Handset Subsidy	5	0.749

### 4.3 Factor Analysis

Bartlett's Test of Sphericity and Kaiser-Meyer-Olkin measure of sampling adequacy were used to test the 20 items of 4 factors that might have influence on the development strategy of mobile telecommunication service providers. Table 4 shows that the Kaiser-Meyer-Olkin value reaches 0.916, which is higher than the recommended minimum of 0.6 (Kaiser, 1974). Bartlett's Test of Sphericity (Bartlett, 1954) reaches statistical significance ( $p = 0.00$ ), supporting the factorability of the correlation matrix.

Principal component method was also used to extract the factors. Table 5 shows that there are four factors extracted with eigenvalues greater than 1. The four factors explain 60.175 per cent of variance. Final extraction shows that there are 4 factors with eigenvalues greater than 1. The variance explained remained at 60.175 per cent.

**Table 4**  
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.916
Bartlett's Test of Sphericity	Approx. Chi-Square	3.5473
	Degree of freedom	300
	Sig.	.000

**Table 5**  
Total Variances Explained

Comp.	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Var.	Cum. %	Total	% of Var.	Cum. %
1	10.644	42.574	42.574	10.644	42.574	42.574
2	1.965	7.859	50.433	1.965	7.859	50.433
3	1.291	5.165	55.599	1.291	5.165	55.599
4	1.144	4.577	60.175	1.144	4.577	60.175

Extraction Method: Principal Component Analysis.

The underlying constructs were investigated by using Varimax rotation with Kaiser Normalization. According to Hair Jr et al. (1995), variables with loadings greater than 0.3 is considered significant; greater than 0.4 is more important and loadings with value 0.5 or above are very significant. Table 6 shows the 20-item distribution after rotation. Four main factors are extracted out. Table 6 proves that the 20 items of development strategy from the questionnaire are carefully put into four categories. Therefore, construct validity test on development strategy indicates that four constructs are valid for further analysis. Hence, multiple linear regression analysis ensues to investigate the influence of these four constructs on development strategy.

**Table 6**  
Rotated Component Matrix

Items	Component			
	Legal Framework	Quality of Service	OTT Applications	Handset Subsidy
The legal framework in Vietnam support to create a competitive mobile telecommunication service market.	.882	-.005	.142	.320
Although the mobile telecommunication service is considered as politically sensitive sector in Vietnam, the mobile telecommunication service provider will be more developed when they are privatized.	.703	.037	.127	-.186
The mobile telecommunication service provider will be more developed when subscribers are allowed to change the network without changing their subscriber numbers.	.682	.134	.440	.417
The government manages well its policy to protect the right of the subscribers.	.588	-.040	.230	-.072
The government policy encouraged the investment in mobile telecommunication infrastructure & services (network expansion, sale & marketing investment, new service development).	.750	.010	.261	-.230
I am satisfied with the quality of the existing mobile telecommunication network (call successful rate, call dropping rate, voice quality, network coverage).	.211	.710	.123	-.336
I am satisfied with the promotion plans implemented by the existing mobile telecommunication service provider.	.302	.613	-.270	.196
I am satisfied with the tariff plans provided by the mobile telecommunication service providers since it is adaptive to my needs.	.398	.763	-.194	.012
I am satisfied with the convenience to access to the services provided by mobile telecommunication service provider (registration, change the plan, flag shop).	.402	.665	-.137	.000
I am satisfied with the customer care services provided by the existing mobile telecommunication service provider.	.283	.566	-.194	-.168
My monthly expense for mobile service reduces by using the OTT application (such as Viber, Zalo, Facebook messenger, skype).	.212	.378	.747	-.106
I will not use OTT application if the mobile telecommunication service operators implement more attractive bundle tariff plans (all voice, data and SMS services with fixed lump sum price).	.464	.060	.600	-.009
I do not receive enough information regarding to the handset subsidy plans given by the mobile telecommunication service provider.	.459	-.474	-.221	.728
I feel the handset subsidy plan is not interested because I want to be able to change my handset at any time.	.464	-.208	.114	.622
I feel the handset subsidy plan is not interested when the mobile telecommunication service provider ask the subscriber to pay for large amount of fee in advance.	.244	-.136	.247	.742
I am not interested in handset subsidy plans because I am worry that my personal information can be gathered by the mobile telecommunication service operator through specific applications installed on its subsidy phone.	.300	.009	.280	.664
I feel inconvenient when the subsidized handset could be used in a specific network only.	.393	.110	.363	.610

Extraction Method: Principal Component Analysis.  
a. 4 components extracted.

In Table 7, the adjusted R-square of multiple correlation coefficient (adjusted R<sup>2</sup>) value indicates that 74% of the variances associated with the business of mobile telecommunication service providers in Vietnam can be explained from the 4 independent variables. The F-statistics is also significant (F = 11.839) which confirms that all the 4 variables collectively make a significant contribution to the fitness of the regression model and are statistically significant in explaining the variance of the business of mobile telecommunication service providers in Vietnam.

**Table 7**  
Model Summary

Model	R	R Sqr.	Adj. R Sqr.	Std. Err. of the Est.	Change Statistics		
					R Sqr. Chg.	F Chg.	Sig. F Chg.
1	.860 <sup>a</sup>	.739	.74	.9448	.74	11.839	.000

a. Predictors: (Constant), 4 components

Model 1 in Table 8 shows the coefficients for the four predictors' variables with the business of mobile telecommunication service providers in Vietnam. The significant value ( $p < 0.05$ ) indicates that there is a positive significant relationship between legal framework, OTT applications, quality of service, handset quality and the business of mobile telecommunication service providers in Vietnam. When legal framework, OTT applications, quality of service, handset quality improves, the business of mobile telecommunication service providers in Vietnam will also improve.

**Table 8**  
Coefficients of Factors

Model		Unstd. Coeff.		Std. Coeff.	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.001	.062		.014	.000
	Legal framework	.377	.062	0.376	1.239	.000
	OTT applications	.274	.062	0.274	1.204	.000
	Quality of service	.326	.062	0.326	0.423	.000
	Handset subsidy	.170	.062	0.170	2.756	.003

a. Dependent Variable: development strategv

#### 4.4 Summary of Hypotheses

There are 4 hypotheses in this research. Statistics are generated accordingly based on SPSS in order to assess all the hypotheses. Hypotheses findings are summarized as followed in Table 9.

**Table 9**  
Summary of Hypotheses

No	Hypothesis	Results
H1	There is a relationship between legal framework and the development of mobile telecommunication service providers in Vietnam.	Accepted
H2	There is a relationship between OTT applications and the development of mobile telecommunication service providers in Vietnam.	Accepted
H3	There is a relationship between quality of service and the development of mobile telecommunication service providers in Vietnam.	Accepted
H4	There is a relationship between handset subsidy and the development of mobile telecommunication service providers in Vietnam.	Accepted

## 5. Conclusion

Four factors have been identified to have significant impacts on the business of mobile telecommunication service providers including legal framework, OTT applications, quality of service and handset

subsidy. Of these four factors, legal framework plays the most significant role in the business of mobile telecommunication service providers in Vietnam.

The four factors collectively explain 60 percent of variance of the successful business for mobile telecommunication service providers.

### *5.1 Objective 1: To determine how legal telecommunication framework influence mobile telecommunication service providers*

The finding indicates that legal telecommunication framework is related to the business of mobile telecommunication service providers. Out of the four independent variables, legal telecommunication framework has the highest significant positive relationship. High percentage of respondents agreed that Vietnam government policy should encourage the investment in mobile telecommunication infrastructure & services (network expansion, sale and marketing investment, new service development (mean = 3.76). Moreover, this study also discovered that respondents hold the opinions that mobile telecommunication service providers will be more developed when they are privatized (mean = 3.55). Respondents also agree that Vietnam government manages well its policy to protect the right of the subscribers (mean = 3.62).

### *5.2 Objective 2: To identify how OTT applications influence mobile telecommunication service providers*

The findings of this study indicate that OTT applications are significantly and positively related to the business of mobile telecommunication service providers. Most respondents agree that their monthly expenses for mobile service reduced by using the OTT application (such as viber, zalo, facebook messenger, skype) (mean = 3.80). Respondents also agree that they feel comfortable with the advertisement or spam caused by OTT applications with mean = 3.60. In other words, it means that users are so used to OTT that they do not feel annoyed if OTT applications are accompanied with spams or advertisements.

Respondents also agree that they purchase smart phone and using data service from the mobile telecommunication service provider mainly because they want to use OTT applications (mean = 3.61). The findings also disclose that respondents are willing to accept the increase of the data service tariff in order to access to the mobile Internet in compensation to OTT usage (mean = 3.71).

### *5.3 Objective 3: To determine how the mobile telecommunication service providers can maintain and expand their subscribers through improvement in quality of services*

The customer loyalty will be well-maintained if the quality of services are improved, especially when the government implement the Number Portability Scheme from 1/1/2017 which allow the subscribers to change to new service provider without changing their existing phone number. New subscribers would be motivated to switch their subscription to a service network which has better service quality if they do not satisfy with the quality of service provided by their existing service provider. As large percentage of subscribers use the service from more than one service provider, they can have more than one option to use the service at the same time. Therefore, the service provider with better quality of service will be chosen whenever the subscriber has demand to use the service.

### *5.4 Objective 4: To investigate whether handset subsidy will help mobile telecommunication service providers increase revenue and its number of subscribers*

Handset subsidy will help the service providers to increase revenue and number of subscribers because mobile service providers the price of handset is usually much higher than the tariff they receive from the services.

Moreover, handset subsidy will attract new subscribers as their total cost ownership (cost of handset + cost of telecommunication service) will be smaller. Handset subsidy will provide chances for the subscribers enjoy the latest version of handset even if they do not have enough money to afford to by such new handset at the moment. As the subsidized handset is always restricted to a specific service provider, the handset subsidy will help to maintain the loyalty of the subscribers.

### *5.5 Recommendations for Vietnam's Government for the development of mobile telecommunication service operators until 2020*

Since improvement in legal framework is crucial for the improvement in the business of telecommunication industry, this study recommends government of Vietnam and management agencies need to continue the improvement of the legal framework by:

- Creating and ensuring fair competition in the market of mobile communication services.
- Accelerating the process of privatization of state-owned mobile communication service providers (Mobifone, Viettel, Vinaphone and G-Mobile). Privatization with competition system is essential in which the government should not own majority number of shares (i.e. more than 50%) of more than one service provider.
- Implementating project by Telecommunications Bureau (VNTA) to allow mobile subscribers maintain their number (number portability) when changing service providers.
- Promulgating regulations to ensure management of development OTT service, which offers huge benefits to the whole society as well as the compel mobile telecommunication service providers to operate more efficiently.
- Promulgating strict regulations on the quality standards of service, protecting interests and rights of subscribers.
- Licensing 4G service for mobile communication service providers to ensure availability when demand for mobile internet services booms.

### *5.6 Recommendations for Mobile Telecommunication Service Providers in Vietnam*

Since improvement in OTT applications, quality of service, and handset subsidy are crucial for the improvement in the business of telecommunication industry, state-owned providers of mobile communication services (Viettel, Mobifone, Vinaphone and G-Mobile) need to have the plan for equitization trend. The mobile communication service providers need to continue to invest and improve the quality of service, build diverse packages and invest in flexible and effective management system of customer relations as well as enhance the capacity of outlets / channels for customers to access services quickly and smoothly. Since smartphone is increasingly cheap and popular, mobile communication service providers should stimulate user demand for data services which will contribute to increase revenues. Besides, the service provider of mobile communication should also have strategies to provide more diversified data package towards bundle, or even increase the data fee in order to bring greater revenue. Value-added services, content services and utility services like mobile payment, mobile banking, mobile security, etc should be provided to help operators increase ARPU (Average Revenue per User). On top of that, phones purchased under the subsidy program should not be restricted to be used only within a single network. Service providers can also cooperate with banks to provide guarantees or loans for customers. Communication with customers should also be strengthened to promote the sale of handset subsidy more effectively to potential customers. Service providers should also ensure the safety and information security of customers in order to attract more new customers.

### *5.7 Limitations*

The respondents in this study are the subscribers with certain knowledge about the mobile telecommunication industry and living in three main big cities. Therefore, the findings might not be able to be generalized for the whole Vietnamese population with different backgrounds or perceptions.

### 5.8 Recommendations for Future Research

This research identified 4 important factors affecting 60% of the business of mobile telecommunication service providers in Vietnam, further research could be conducted to research into other factors that have not been identified in this study such as human resource and organization management, branding management, innovation management or even technical operation and management, which might also have influence on the business of mobile telecommunication industry.

Further research could be also done on respondents living in other regions beside 3 biggest cities of Vietnam as people live in different geographical region might have different mindset and perceptions. Furthermore, future research could be conducted to compare between perceptions of the respondents with certain knowledge about telecommunication industry and the general respondents in the country.

### References

- Abdollahi, A., Moshkforoush, A., Ghodoosi, B., & Mohammadesmaeil, M. (2017). Strategic analysis of the mobile services value chain in Iran's capital market and development of a mechanism to promote it. *Management Science Letters*, 7(12), 565-576.
- Bartlett, M. S. (1954). A note on the multiplying factors for various  $\chi^2$  approximations. *Journal of the Royal Statistical Society. Series B (Methodological)*, 296-298.
- Bitner, M. J. (1990). Evaluating service encounters: the effects of physical surroundings and employee responses. *the Journal of Marketing*, 69-82.
- Bolton, R. N., & Drew, J. H. (1991). A longitudinal analysis of the impact of service changes on customer attitudes. *the Journal of Marketing*, 1-9.
- Brady, M. K., & Cronin Jr, J. J. (2001). Some new thoughts on conceptualizing perceived service quality: a hierarchical approach. *Journal of Marketing*, 65(3), 34-49.
- Carman, J. M. (1990). Consumer perceptions of service quality: an assessment of T. *Journal of Retailing*, 66(1), 33.
- Cronin Jr, J. J., & Taylor, S. A. (1992). Measuring service quality: a reexamination and extension. *the Journal of Marketing*, 55-68.
- Hair Jr, J. F., Anderson, R. E., Tatham, R. L., & William, C. (1995). Black (1995), Multivariate data analysis with readings. *New Jersey: Prentice Hall*.
- Kaiser, H. F. (1974). An index of factorial simplicity. *Psychometrika*, 39(1), 31-36.
- Nunnally, J. (1978). Psychometric methods. In: New York: McGraw-Hill.
- Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *the Journal of Marketing*, 41-50.
- Peterson, R. A. (1994). A meta-analysis of Cronbach's coefficient alpha. *Journal of Consumer Research*, 21(2), 381-391.
- Qureshi, M. I., Khan, A., Zaman, K., & Khaqan, N. (2014). Structural investigation of service quality in conventional and islamic banking in pakistan. *International Journal of Management and Innovation*, 6(1), 84.
- Sekaran, U. (2000). Scientific Investigation. *Research Methods for Business: A Skill Building Approach*, 3, 19-35.
- Sekaran, U., & Bougie, R. (2010). Research Methods for Business: A Skill. *Building Approach*. UK: John Wiley.

