Analyzing the Impact of Service Quality Antecedents on Customer Satisfaction: The Case of Foreign Users of China Mobile Services in Shanghai

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Abstract– Among other sectors such as trade, financial affairs, economics, shipment, and IT appliances, Shanghai has become one of the fastest growing and largest international metropolises in the world. With its 500 thousand foreign residents, Shanghai has been ranked as the city with the highest rate of international residents in China. Unfortunately, there are no appropriate or tailor-made service packages within China's mobile telecom services allocated to foreign users of the mobile communication industry in Shanghai. The current paper aims to find out about the key factors of the mobile telecommunication industry, which are strongly correlated to customer satisfaction in China. The exploratory study is primarily based on data collected among China Mobile's foreign users in Shanghai. The sample consists of 259 foreign residents randomly selected from the population frame offered by the ones who have settled down in Shanghai. Although the findings of this study are specific to China Mobile, they can also be generalized to other companies operating in this business area in China. Suggestions are also offered for further research.

Index Terms– Customer Satisfaction, Service Quality, China's Mobile Telecommunication, China Mobile and Shanghai China

I. INTRODUCTION

CHINA'S mobile telecommunication industry growth ranks first in the world with its 963.68 million subscribers dispatched among three telecommunication operators in China (Megan, 2011). According to the statistics published recently by China's Ministry of Information Industry (November 2011), China Mobile, the country's largest mobile carrier, has reached 644.32 million subscribers, including 48.1 million of 3G subscribers in China. With these statistics, China's mobile telecommunication market has become one of the main sectors driving the Chinese economy. With the restructuration of China's telecommunication industry in 1999, China Mobile has been created. The same year, it counted about 17.96 million mobile users (Megan, 2011). Within the last decade, Shanghai has become one of the fastest growing and largest international metropolises in the world regarding sectors such as economics, financial affairs, trade, and shipping. The number of foreign investors and residents has also grown. With its 500 thousand foreign

residents, Shanghai has been ranked as one the cities with the highest rate of international residents in China. Over 78% of foreigners have settled down working and studying in Shanghai. However, there are no appropriate or tailor-made service packages within China's mobile telecommunication industry services allocated to these foreigners in China. As mentioned above, the current paper focuses on China Mobile Company, which is the country's largest in this market in China. It is therefore important to observe that more than 80% of these foreign users do not know about the exact cost of local, long-distance, and international calls. In addition, they are unaware of different service packages available on the market, since most of them lack of knowledge in Chinese mandarin, which is used as the main operator language, except when making direct inquiries to customer service. There is no brochure available or other services introducing China Mobile's services in English or other foreign languages; none of the packages do provide international calls without resorting to the use of IP cards and prior registration. Among others, China Mobile is facing critical gaps such as lack of good covering signal reception in most buildings and apartments in Shanghai, as well as the ability to boost tailor-made services and flexibility concerning foreign users' requirements and expectations.

According to Anderson and Sullivan (1993), high customer satisfaction levels can lead to reduce perceived benefits from alternative providers and therefore increases repurchase intentions. In this outlook, Anderson and Srinivasan (2003) added that when customers are dissatisfied, they are more likely to search for alternative solutions and to yield to competitor proposals than are satisfied users or consumers.

Therefore, there is no doubt about the importance of service quality as the ultimate goals of China Mobile Company. The current paper attempted to use the method of Bivariate Correlations Analysis to investigate the relationship between the antecedents related to service quality customer satisfaction through a survey conducted among China Mobile foreign users living in Shanghai. Motivated by prior studies in the business of the mobile telecommunication market, the current paper aims to examine the influence of service quality on customer satisfaction. Besides, the paper has intended to point

out individual factors of service quality, which have a direct impact on customer satisfaction based on an experience and perspective of foreign users in Shanghai.

II. CUSTOMER SATISFACTION

Customer satisfaction is increasingly recognized as a pillar in the business environment and also as a key factor in the business life cycle. In order to meet customers' needs, mobile telecommunication providers should continuously improve their services to respond to their subscribers' needs. As noted by Anderson et al. (1993), a high level of service quality exerts a positive influence on customer satisfaction. According to Bruhn (2003), customer satisfaction is "an experience-based assessment made by the customer of how far his own expectations about the individual characteristics or the overall functionality of the services received from the provider have been fulfilled". The most common interpretations gathered from various scholars defined the notion of satisfaction as a feeling that results from a process of evaluating what has been received compared to what was expected (Ingrid Fecíková, 2004).

Oliver (1997) has defined satisfaction is a function of expectancy/disconfirmation, which is a function of both expectations and performance. The disconfirmation paradigm in process theory provides the grounding for the vast majority of satisfaction studies and encompasses four constructs: disconfirmation, expectations, performance, and satisfaction (Churchill et al., 1982). Therefore, customer satisfaction is a person's feelings of pleasure or disappointments resulting from perceived products/services compared to their expectations. If the performance falls short of expectations, the customer is dissatisfied, and if it matches the expectations, the customer is satisfied. If the performance exceeds expectations, the customer is highly satisfied or delighted. Kotler (2003) has outlined customer as person's feeling of pleasure or disappointment resulting from comparing the perceived service outcome in relation to his expectations. Furthermore, Hutcheson et al. (1998) has defined it as the gap between the customer expectations and actual performance of the service; narrower is the gap, higher is the customer satisfaction.

III. SERVICE QUALITY

Service quality constitutes one of the most debated subjects in various fields. However, there is no consensus about how to define it (Gupta et al., 2005). To measure service quality is complex and difficult because it is not tangible and each person can evaluate it differently. Service quality constitutes one of the most important catalyzers of customer satisfaction (Kumar et al., 2009). Santos (2003) has defined the service quality as a measure of how well the delivered service level matches customer's expectations. Customers feel satisfied when the perception of service quality meets or exceeds their expectations. Several scholars have identified causal relationships between customer satisfaction and service quality, and confirmed the positive effect of service quality on customer satisfaction (Kim et al., 2004; Lim et al., 2006). In addition, it is an indicator of the satisfaction level between a

customer's expectations and perceptions with regard to a delivered service. Grönroos (1982) has defined the perceived service quality as the result of an evaluation process, where the customer compares his expectations with the service he/she has received. Parasuraman et al. (1985) define the perceived service quality as the result of actual service performance against consumer expectations; and furthermore, the evaluations of service quality are not only the outcome of performed services but also an assessment of the process of service delivery.

Service quality is the degree of excellence attained in meeting customer expectations and the control of achieving that excellence. Several instruments have been used and developed aiming to explain service quality dimensions. Parasuraman et al. (1985), proposed the well-known SERVQUAL model constituted of the following five dimensions of service quality such as assurance, empathy, reliability, responsiveness, and tangibles. In this model, service quality is measured as the gap between customer expectations and perceptions (Parasuraman et al., 1988).

According to Choi et al. (2007), mobile telephony quality is measured in the stream of work categorized into network coverage, mobile device, value-added services, billing system, convenience and price structure. Based on the work of Choi et al. (2007), who have identified the quality factors in the mobile telecommunication research, an explanatory research was implemented to examine the causal relationship between four dimensions of service quality such as staff empathy, billing and pricing structure, technology, and value-added services and customer satisfaction, grounded on the experience foreign users of China Mobile services in Shanghai.

IV. CONCEPTUAL FRAMEWORK

The conceptual framework is shown in Figure 2. The survey was developed based on the recent studies as described as follow:
a) Customer satisfaction. A single overall customer satisfaction measurement was adopted to avoid any appreciation problem related to different scales of this concept.
b) Service quality. Based on the work of Choi et al. (2007) in the mobile telecommunication industry, the antecedents of service quality associated with the current study are conceptualized as below:
   - ✓ *Staff empathy (three antecedents).* This construct measures particularly care and individual attention provide to customers as well as including customer responsiveness, employee courtesy and the ability of conveying confidence and trust (Parasuraman et al., 1988).
   - ✓ *Billing system and pricing structure (three antecedents).* This construct includes the provision of accurate billing system, billing issues solving ability and the reasonability of pricing structure including special offers (Lim et al., 2006).
   - ✓ *Technology (three antecedents).* This construct concerns about the ability of providing a promised service including calls clarity, network coverage and

Internet accessibility offered by the mobile telecommunication provider (Parasuraman, 1988; Kim et al., 2004).

✓ *Value-added services (five antecedents).* This

dimension is considered be associated to intangible features such as SMS, MMS, GPRS, ringtones, operating language facilities, and innovation awareness (Kim et al., 2004)   .
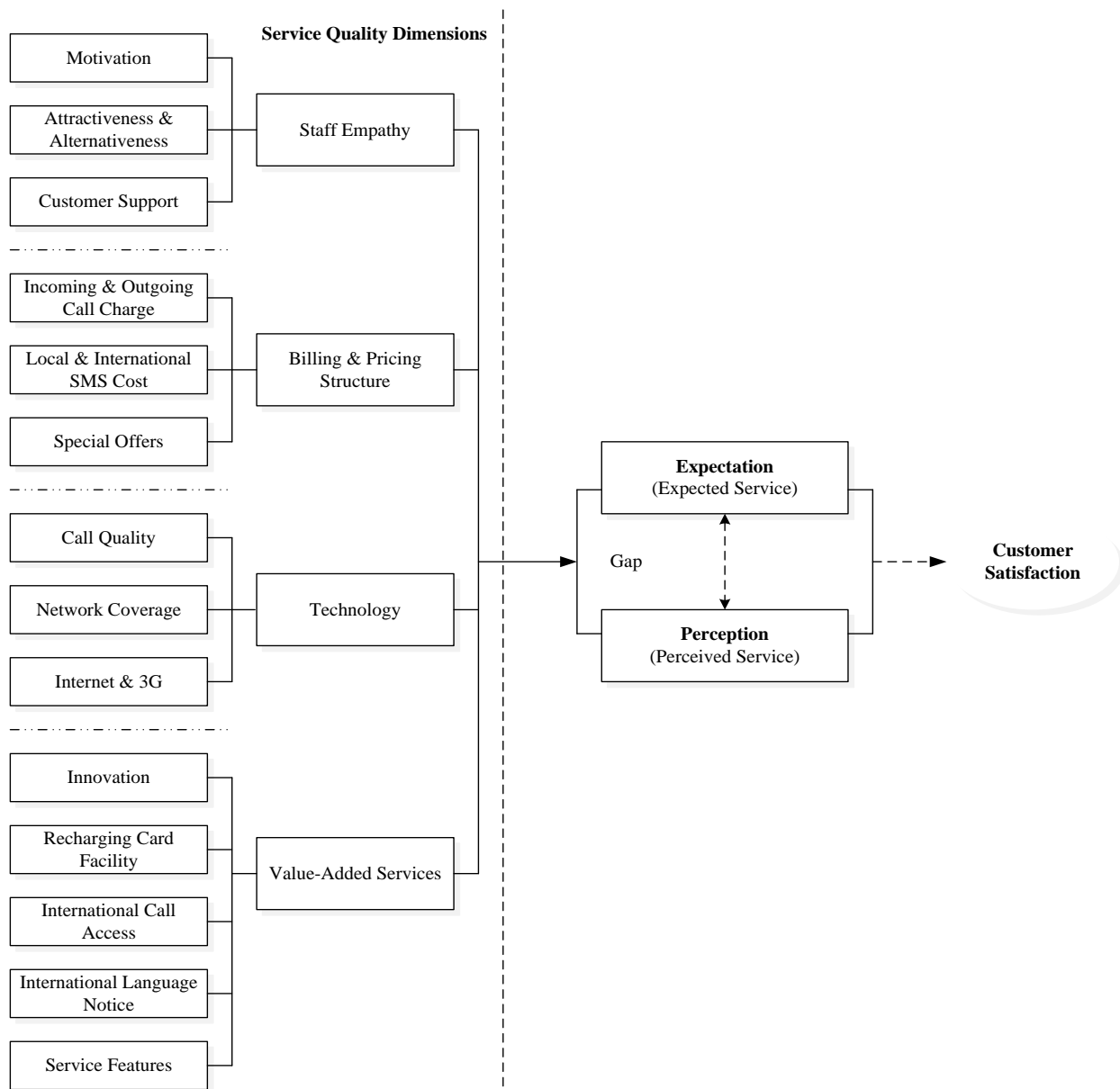

Figure 1: Research Framework

V. HYPOTHESES STATEMENT

From the theoretical framework discussed above, four hypotheses were developed in the current research as follows:

- H1: Staff Empathy has a significant relationship with Customer Satisfaction.
- H2: Billing system and Pricing Structure have a significant influence on Customer Satisfaction.

- H3: High Level of Technology has significant effects on Customer Satisfaction.
- H4: Value-added Services have significant effect on Customer Satisfaction.

A. Data Collection

A mixed approach was applied to examine customer satisfaction level among foreign users of China Mobile services in Shanghai. Primary data were collected through observations and surveys over a period of eight months, and

secondary data from secondary sources such as Internet, publications, personal records, participation and census. Therefore, a survey was developed to inquire about the customer satisfaction level to emphasize the importance of each factor of service quality and dimension. The survey was defined based on five scales such as 1 = very dissatisfied to 5 = very satisfied) and completed by other aspects related to demography and personal information.

Thus, the survey was developed based on the main four constructs reviewed in this study such as staff empathy, value-added services, billing system and pricing structure, and technology to enquire about the their probable influence in the China mobile telecommunications industry. Furthermore, to determine the most influential antecedents associated to this market. Respondents were asked to indicate their satisfaction level for each factor examined in the current study. To ensure the validity of the current study, the following steps were performed:

- Survey questions were established based on the literature of reference to guarantee the validity of the result;
- Data were collected through foreign respondents who have experienced using China Mobile's services in Shanghai; and
- A random pre-test was conducted among China Mobile users to inquire whether the questions made sense to them.

B. Sample and Response Rate

The research was conducted among foreign users of China Mobile services living in Shanghai; the country's largest mobile carrier in China. On a total of 300 surveys sent out, 276 responses were obtained including 19 useless and 259 usable responses. The useful response rate was 86.33%. Demographic statistics and personal information are summarized in Table 1.

The test was carried out to ascertain the relationship between service quality and customer satisfaction by using SPSS (version 17). Thus, the test of Pearson was carried out to evaluate the hypotheses and completed by the Bivariate Correlations Analysis, Factor Analysis, and Means to validate the correlation between independent and dependent variables, and also to outline the most influential factors associated to customer satisfaction in this market.

Table 1: Demography Description

Variables	Items	Frequency	Percent %
Gender	Male	138	53
	Female	121	47
Age	< 18	5	1.9
	19 – 35	189	72.9
	36 – 50	57	22.7
	> 50	8	2.5
Population Distribution	Oceania	3	1.2
	Africa	39	15
	America	81	31.3
	Europe	59	22.7
	Asia	77	29.8
Social Status	Student	152	58.7
	Worker	84	32.4
	Unemployed	10	3.9
	Self-employed	13	5
Monthly Income	< 800 RMB	21	8.1
	800~3999 RMB	109	42
	4000~11999 RMB	74	28.6
	12000~39999 RMB	52	20.1
	>40000 RMB	3	1.2

C. Descriptive Statistics and Data Measurement

Reliability coefficient (*Cronbach's Alpha*) was obtained by using the procedure of reliability process in SPSS. As usual, Alpha's coefficient above 0.70 is regarded as acceptable for psychometric measurements (Nunnally, 1967). Cronbach's Alpha coefficient of each scale is between 0.702 and 0.854 (Table 2). All coefficients are higher than 0.7; therefore confirming the reliability of the current study. It implies that the survey is supposed to be reliable, stable, and appropriate to conduct the study.

Table 2: Reliability Statistics

	Mean	Std. Deviation	Cronbach's Alpha	N of Items
Staff Empathy	3.23	0.732	0.718	3
Billing & Pricing Structure	3.27	0714	0.702	3
Technology	3.23	0.820	0.854	3
Value-Added Service	3.49	0.621	0.723	5
Customer Satisfaction	3.93	1.472	-	1

Table 3: KMO and Bartlett's Test

		Service Quality
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.822
Bartlett's Test of Sphericity	Approx. Chi-Square	693.356
	Df	6
	Sig.	0.000

Table 4: Total Variation Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.107	77.669	77.669	3.107	77.669	77.669
2	0.443	11.067	88.737			
3	0.274	6.851	95.587			
4	0.177	4.413	100.000			

Extraction Method: Principal Component Analysis.

Factor Analysis test was performed to determine the reliability and validity of the service quality related to the four constructs used in the current study. Thus, Kaiser-Meyer-Olkin (KMO) and Bartlett's, as well as Principal Component Analysis tests were performed. KMO equals value equals 0.822 (Table 3), i.e. higher than 0.5 and closer to 1, Significance Level value was less than 0.05; it implies that data are suitable for performing this analysis.

The four factors in the initial solution have Eigenvalues greater than 1. The first component accounts for 77.67% (Kaizer, 1974) of the variability in the original variables. It suggests that the four constructs are associated with the service quality. The cumulative variability explained by the first factor in the extracted solution is about 77.6%, which implies that it can be explained by the factor model.

Bivariate Correlations Analysis was used to inquire about the probable relationship between customer satisfaction and the fourteen determinants examined in this paper; moreover to measure the strength their relationship. Therefore, the results of the Pearson correlation coefficient test are resumed as follows:

Figure 2 shows a low and moderate correlation between motivation and attractiveness and alternativeness related to customer satisfaction. It suggests that these antecedents have no significant impact on the customer satisfaction level of China Mobile users since most foreigners resort occasionally to China Mobile's operators for either complains or information inquiry. In addition, there is strong and position correlation between customer support and customer satisfaction. It suggests that customer support is an important factor of service quality for predicting customer satisfaction (Kim et al., 2004). Thus, China Mobile should put a particular attention on this factor to provide an overall satisfaction to its foreign users.
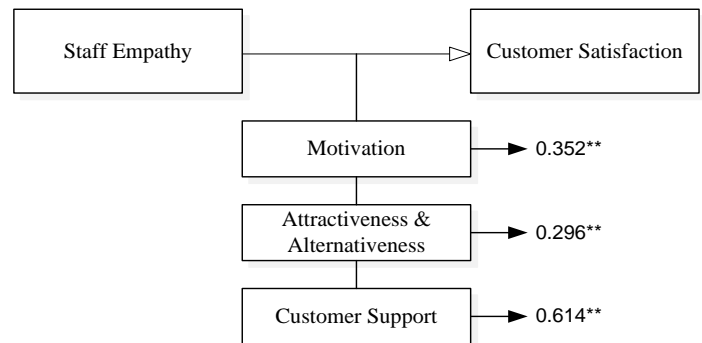

Figure 2: Staff Empathy predicting Customer Satisfaction

Figure 3 illustrates the existence of a significant and nearly high positive correlation between incoming and outgoing call charges, and customer satisfaction. It suggests that these variables are highly related to customer satisfaction and may have a strong influence on how foreign users perceive China Mobile's pricing structure. In addition, there exists a moderate correlation between local and outgoing short message (SMS) and special offers with customer satisfaction. The probable explanation is that the cost of short messages is very low; therefore it is out of foreign users' scope of service quality appreciations. In addition, they seem not to care about the billing system since most of them use the pre-paid cards; expect for some expatriates for which the expenses are taken in account by the company.
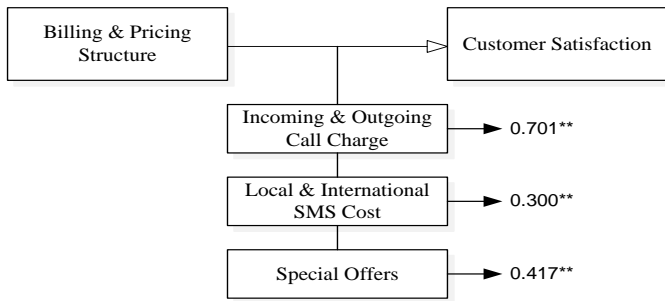
Billing & Pricing Structure → Customer Satisfaction

Incoming & Outgoing Call Charge → 0.701**

Local & International SMS Cost → 0.300**

Special Offers → 0.417**

Figure 3: Billing and Pricing Structure predicting Customer Satisfaction

Technology → Customer Satisfaction

Call Quality → 0.605**

Network Coverage → 0.622**
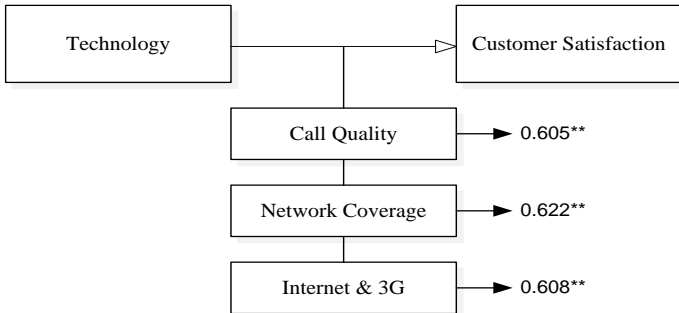
Internet & 3G → 0.608**

Figure 4: Technology predicting Customer Satisfaction

Figure 4 shows a significant and strong positive correlation between call quality (or call clarity), network coverage, internet and 3G, with customer satisfaction. It suggests that these variables may considerably affect foreign users' satisfaction level. It also shows that foreign users care a lot about all the aspects associated to technological performance. Call clarity constitutes one of the key factors in the mobile telecommunication market; therefore it should continuously be improved to maintain and generate customer satisfaction. Unfortunately, as mentioned above, the network coverage remains one of the weak points of China Mobile services in Shanghai; China Mobile should pay more attention to these factors and a particular should be sustained to improve the network coverage in Shanghai. With a rising number of smart phone users, the Internet facilities through a smart phone has become an overlooked issue; China Mobile should unceasingly improve these antecedents to respond positively to its foreign users' requirements and expectations.

Figure 5 shows an important and nearly solid positive correlation between national recharging card facilities and customer satisfaction. The result shows that this antecedent has an important influence on customer satisfaction. It suggests that it important for China Mobile to apply a unique recharging card in the whole China regardless to regional partitions as they have been established in this market by China Mobile. It is always inconvenient to recharge the cell phone when being out of the subscribed cities or regions. However, the impact of innovation, international calls accessibility, service features and language remain insignificant to foreign users in this market. It implies that foreign users do not care about these requirements since they usually make use of other people's help regarding these issues, and the innovation is more associated with mobile devices'
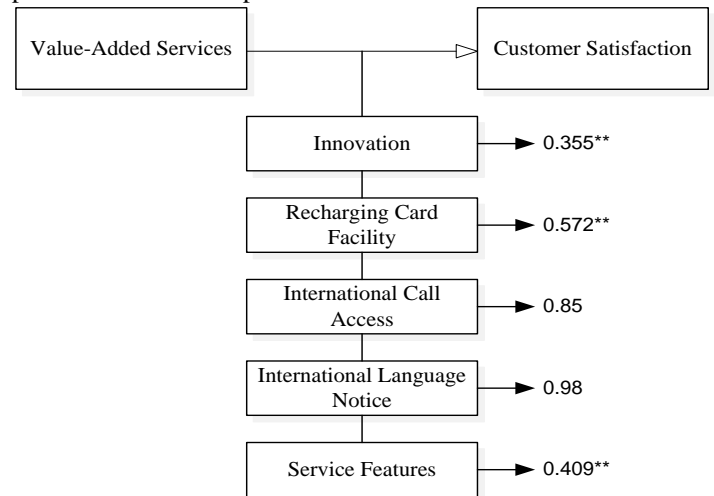
provider than service provider.

Value-Added Services → Customer Satisfaction

Innovation → 0.355**

Recharging Card Facility → 0.572**

International Call Access → 0.85

International Language Notice → 0.98

Service Features → 0.409**

Figure 5: Value-Added Services predicting Customer Satisfaction

VI. HYPOTHESES TEST AND RESULTS

As mentioned above, the method of the Bivariate Correlations Analysis was adopted to express the relation among different variables examined in the current study.

Table 5: Bivariate Correlations Analysis

Variables		Customer Satisfaction
Staff Empathy	Pearson Correlation	0.535**
	Sig. (2-tailed)	0.000
	N	259
Billing & Pricing Structure	Pearson Correlation	0.605**
	Sig. (2-tailed)	0.000
	N	259
Technology	Pearson Correlation	0.695**
	Sig. (2-tailed)	0.368
	N	259
Value-added Services	Pearson Correlation	0.431**
	Sig. (2-tailed)	0.000
	N	259
Gender	Pearson Correlation	0.034
	Sig. (2-tailed)	0.589
	N	259
Country's Origin	Pearson Correlation	0.046
	Sig. (2-tailed)	0.458
	N	259
Age	Pearson Correlation	0.057
	Sig. (2-tailed)	0.357
	N	259
Social Status	Pearson Correlation	-0.004
	Sig. (2-tailed)	0.955
	N	259
Income	Pearson Correlation	-0.028
	Sig. (2-tailed)	0.650
	N	259

Remark: (**) stands for a significant correlation at 0.01 level, and (*) stands for a significant correlation at 0.05 level. The values without marks relate to a weak correlation between two variables or are not significantly correlated.

A. *Customer Satisfaction and Staff Empathy*

Based on the first hypothesis of this research (H1), Staff Empathy is supposed to be positively correlated to customer satisfaction. It suggests that foreign users are satisfied when the perceived services meet or exceed their expectations. According to the results shown in Table 5, the correlation coefficient is 0.535**, which implies that the impact of staff empathy is significant and it has a moderate influence on customer satisfaction. The hypothesis on staff empathy was accepted.

B. *Billing System, Pricing Structure and Customer Satisfaction*

Based on the second hypothesis (H2) of the research, the billing system and pricing structure are supposed to be positively correlated to customer satisfaction. It implies that an attractive cost package may significantly affect China Mobile users' satisfaction. According to the results shown in Table 5, the correlation coefficient is 0.605**, which suggests that the cost package has proved to be significant and has a strong impact on customer satisfaction level. The hypothesis on the billing system and cost structure was supported.
China's mobile industry has been growing exponentially in China. At this stage, the main two service providers operating in the mobile telecommunication market may offer similar services even though they do not both use the same technology; therefore, customers may become more price sensitive than services sensitive. Under these circumstances, the pricing structure constitutes a great indicator for judging the users' satisfaction level.

C. *Customer Satisfaction and Technology*

Based on the third hypothesis (H3) of the current research, high level of technology is supposed to be positively correlated to high level of customer satisfaction. It indicates that providing a good technical performance may positively affect customer satisfaction. According to the results shown in Table 5, the correlation coefficient is 0.695**, which implies that a high level of technology has proved to be significant and has a strong influence on the level of customer satisfaction. The hypothesis on the technology performance was supported.

It is obvious that a high level of technology is one of the key factors for improving the service quality in the mobile telecommunication market. Furthermore, improving the service quality may imperatively bring along a positive effect on customer satisfaction. According to the current research, foreign users in Shanghai are highly sensitive to technical aspects associated to the delivered service quality. Among others, high technology brings along call clarity and good network coverage, which constitute the major factors that have a direct impact on foreign users' appreciation of China Mobile services.

D. *Customer Satisfaction and Value-added Services*

Based on the fourth hypothesis (H4), value-added services are supposed to be positively correlated to mobile foreign users' satisfaction. Introducing the appropriate service packages, unquestionably affects mobile phone telecommunication users. However, as shown in Table 5, the correlation coefficient equals 0.431**, which implies that appropriate packages of value-added services have not been proved to have a significant influence on foreign users' satisfaction. The hypothesis on value added-services related to customer satisfaction was rejected.

Besides, as shown in Table 5, country origin and demographical status of respondents do not have a significant effect on customer satisfaction in this market. The result implies that it is meaningless for China Mobile to make any social distinctions among its foreign users.

VII.   CONCLUSION AND RECOMMENDATIONS

The current research was conducted on China Mobile Company, the country's largest mobile operator in China, and has particularly focused on the main antecedents driving customer satisfaction within foreign mobile users in Shanghai. Previous scholars have found that the service quality has a significant influence on customer satisfaction (Lim et al., 2006). Based on the experience and expectations of foreign subscribers using China Mobile services in Shanghai, the current study has examined the impact of fourteen antecedents of service quality on overall satisfaction of foreign users. It has been showed in the current research analysis that service quality has strong and moderator effects on customer satisfaction. In addition, six out of fourteen antecedents (customer support, incoming and outgoing calls charge, call quality, network coverage, Internet and 3G, and national recharging card facility) were proved to be fairly and positively correlated to customer satisfaction. In order to maintain a high level of its customer satisfaction, China Mobile should pay a particular attention to the antecedents described in Figure 1. In addition, it is also essential that China Mobile focus on the four constructs of the SERVQUAL model reviewed in this paper to increase and maintain its customer satisfaction level.

Therefore, a priority should be given by China Mobile to the following issues:
-   To improve the network coverage. It is always difficult, and sometimes even impossible, to make phone calls inside most apartments and buildings in Shanghai.
-   Incoming call charges should be abolished in all packages offered by China Mobile, customers perceive it as annoying to pay for wrong calls, and the reception of international calls are too costly without a prior subscription for to a special package.
-   With the rising number of foreign residents in China, particularly in Shanghai, China Mobile should provide the choice of subscribing in English or another international language, which could introduce different services and packages offered by China Mobile to its users.
-   China Mobile should provide a comprehensive international package comprising international calls access, with reasonable price structure and international roaming services without resorting to make a special inquiry before having access to it.

- China Mobile must abolish the difference made with regard to Shanghainese and other users living in Shanghai (China Mobile offers a more favourable pricing structure for Shanghainese ID holders).
- China Mobile should apply the same type of mobile recharge cards in whole China; it is not always convenient for customers to recharge their mobile phones when they are out of the registered city.
- Particular attention has to be given to important factors related to the service quality.
- China Mobile should also improve its image perception, as well as to improve its customer value.
- Customer surveys should be frequently conducted among China Mobile users to inquire about their requirements and expectations.

The management implication of mobile phone service providers is that they should strive to ensure a high level of customer satisfaction, which may eventually lead to customer retention and good financial performances. Ensuring customer satisfaction could be obtained by focusing and continuously improving the quality of different antecedents related to service quality examined in the current study.

The findings of this study are helpful to mobile telephone operators to tailor their products/services and pricing strategies to maximize the mobile service users' satisfaction and retention, and could eventually be generalized to all companies working in this business area in China.

A. Limitations and Further Research

The current research has successfully investigated antecedents associated to customer satisfaction in the mobile telecommunications industry. Based on China Mobile services, the current study has provided a comprehensive integrated framework to understand the existence of vigorous relationships between the antecedents associated to the service quality and customer satisfaction. Furthermore China is big and complex, the limited sample of foreign users in Shanghai should not be taken as representative; future research should extend the current study including other cities. Due to the limitation of financial means, only foreign users living Shanghai were covered by the current study. Hence, to provide accurate evidence on the causal relationships among the reviewed antecedents, additional researches are needed to collect endogenous and exogenous data. Besides, to bring further significant suggestions in this business area; future studies should also be extended to other constructs such as customer behaviour, customer loyalty, and customer retention.

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