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#### Contributions to books

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# FACTORS INFLUENCING MOBILE USERS IN SELECTING CELLULAR SERVICE PROVIDERS IN INDIA: AN EMPIRICAL STUDY BASED ON STRUCTURED EQUATION MODEL

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#### **ABSTRACT**

This empirical study has investigated the factors influencing the mobile users in selecting the cellular service providers in India based on Structured Equation Model (SEM). Due to huge growth in mobile subscribers, heavy competition between service providers and Mobile Number portability facility given to the mobile users there is a need to study the impact of various factors influencing mobile users in selecting the service provider. The study was conducted on 361 Mobile phone users for a period of 3 months. The data analysis was conducted in a three-stage process. First, reliability tests were performed. Upon satisfactory results, the factor analysis of the collected data was conducted followed by Confirmatory Factor Analysis (CFA) was performed to confirm the findings. SPSS Statistics 17.0 is used to conduct factor analysis and the validity of the model. Once the model was validated, SPSS Amos 18.0 is used to test the overall fitness of the SEM. The findings have revealed that Customer Service, Service Accessibility and Service Affordability are the most important factor influencing the mobile users compared to Promotional offers to select the service provider. This study has important implication for researchers to understand the level of impact that these factors has on selection of the service provider and the correlation between these factors.

#### **KEYWORDS**

Confirmatory Factor Analysis (CFA), Customer Service, Promotional offer, Service Accessibility, Service Affordability, Structured Equation Model (SEM).

#### **INTRODUCTION**

he telecommunication market in India is booming as reported by Telecom Regulatory Authority of India (TRAI) the total telephone subscriber's base has reached 787.28 Million in December 2010. The Wireless subscription has reached to 752.19 Million in December 2010. Every month on average there is an addition of 22.62 million new subscribers for wireless telephone. The mobile phone has become a ubiquitous device which has cut across all strata of the population, at present the overall tele-density is 66.16% indicating the number of people using mobile phones in India.

In India reforms in telecommunication begin from 1980 when private sector was allowed in telecommunication equipment manufacturing. In 1985 Department of Telecommunication (DoT) was established and in 1986 government established Videsh Sanchar Nigam Limited (VSNL) for International telecommunication and Mahanagar Telephone Nigam Limited (MTNL) for services in metropolitan areas. After the Liberalization of the Indian Telecom Sector in 1994 National Telecom policy (NTP) was established to improve India's position in global Telecommunication and in 1997 TRAI was established to regulate all telecommunication services in India. Bharti, a part of Bharti Enterprises was the first mobile service provider to offer its service on July 7 1995 from then onwards Indian market has witnessed a huge surge in mobile service providers at present there are around 15 service providers in this market among them including Bharti, Reliance India Mobile (RIM), Vodafone, Bharat Sanchar Nigam Limited (BSNL), Idea Cellular Limited (Idea) are major players in this sector.

Indian Telecommunication sector is divided into fixed service providers and Cellular service providers. Cellular service providers are further divided into Global System for Mobile communication (GSM) and Code Division Multiple Access (CDMA). In India the GSM sector is dominated by Airtel and Vodafone where as CDMA is dominated by Reliance and Tata Indicom. Bharti leads the Indian telecom market share with 20.27% followed by Reliance (16.70%) and Vodafone (16.52%).

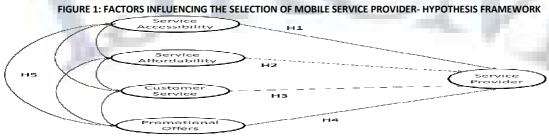
The Indian mobile phone market is growing at a tremendous speed ranging from 13 million (2003) to 167 million (2007) and reached 752 million subscribers in 2010 this growth can be contributed by booming Indian economy, increase user comfort with basic mobility services and personalization of content and devices. The launch of advanced telecom services like third generation mobile (3G) and Internet Protocol Television (IPTV) will also drive the growth in Indian telecom subscriber base and further more mobile handset market is also expected to register a robust growth in near future.

The Mobile service providers in India has transitioned from offering mere voice connectivity to providing value added services to their customers such as Multimedia Message Service (MMS) and internet connectivity. The mobile phone features are also ranging from normal cell phones to PDA features, so the mobile users are finding it increasingly difficult to choose the right service provider.

#### LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

As reported by Internet and Mobile Association of India (2008), Tele Communication in India has moved beyond providing just voice calls. The mobile users are expecting more services from their service providers apart from just making or receiving calls from their mobile phones. There are many factors which are influencing mobile users for selecting the service provider.

This research framework consists of four major factors which are influencing mobile user in selecting the service provider they are Service Accessibility, Service Affordability, Promotional Offer and Customer Service.



#### SERVICE ACCESSIBILITY

Service Accessibility is about making sure its service and information can be used by a wide range of users according to their needs at any place and time. According to Australia's regulator for broad casting, the internet, radio communication and tele communication (2008) mobile service accessibility encompasses the variety of ways the telecommunication carrier can provide its connection from an end-user to a core network connection. Seol,H. et.al (2007) proposed that service providers are more concerned about service and service management, unlike tangible products, since service is a delivery system, designing and

controlling delivery process are important in management of service which need to be improved for better service accessibility to make the service available to consumer. Roma Mitra Debnath and Ravi Shankar (2008) proposed service provider creates a loyal customer base by benchmarking their performance and retaining existing customer in order to benefit from their loyalty. Service provider can create a loyal customer with good service accessibility which is very important factor in selection of the service provider. Therefore, in selection of required mobile service provider service accessibility has significant role. The following hypothesis has been deliberated for further studies.

Hypothesis1 (H1): The service accessibility has a positive and significant effect in selecting the service provider

#### SERVICE AFFORDABILITY

Affordability is a measure of cost related to the amount that a purchaser is able to pay. Kollmann (2000) states that Price plays a vital role in telecommunication market especially for the mobile telecommunication service providers. Michael Draganska & Dipal Jain (2003) analyzed that companies should differentiate consumer preference by using product line as a price discrimination tool by providing different variety of tariff plans to consumer to purchase the product or service according to their requirement.

India is having 752.19 Million mobile subscribers and Informate Mobile Intelligence reports claim that in Average Minutes Per User (AMPU) in India is 25 to 30 minutes per day of active time on voice calls and almost 15 to 20 minutes per day of the active time on messaging. Bharati the major mobile service provider in India claims as on November 2010 that Indian Monthly Average Revenue Per User (ARPU) is 202 rupees which is reduced at 20% on a year base and it is expected to decrease further. As there is an increase in mobile subscribers and increase in AMPU at the same time there is a decrease in ARPU Mobile service providers are planning to attract Mobile users to their service with less affordable price. Jallet and Fredric (2008) analyzed the importance of yield management and discrimination pricing in telecommunication sector. Yield management techniques can help telecom operators and similar companies to optimize the benefits they can derive from a subtle management of information networks and partnerships. So, Service affordability is the also one of the main factors for Indian mobile user for selecting the mobile operator. Second Hypothesis is formulates as.

Hypothesis2 (H2): The service affordability has a positive and significant effect for selecting the service provider

#### PROMOTIONAL OFFERS

Alvarez and Casielles (2005) specified promotion is a set of stimuli that are offered sporadically and it reinforces publicity actions to promote the purchasing of a certain product. Mobile service providers are giving different promotional offers like prepaid offers on top-up recharge, E-recharge mobile top up vouchers for prepaid connection, chota recharge topup, bonus cards, phone alert of astrology, cricket score, call management services, caller tunes, free mobile calls, Short Message Services (SMS) offers, limited time free internet usage, various kinds of ring tone services, dialer tone services and other promotional offers to attract the mobile users.

Chinnadurai and Kalpana (2006) analyzed the increasing competition in cellular services, changing mobile users taste and changing preferences of the customer's all over the world. These circumstances are forcing companies to change their customer promotional strategies. It is analyzed that advertisement play a dominant role in influencing the customers but most of the customers are of opinion that promotional strategies of cellular companies are more sale oriented rather than customer oriented.

Hypothesis3 (H3): The Promotional offers has a positive and significant effect in selecting the service provider

#### **CUSTOMER SERVICE**

Arindam Mukherjee (2006) analysed that the major challenge for the mobile service provider is managing customer. Industrial analysis revealed that only 25% of the acquired customer stay with the company after a year's time and on average only 20 – 30 % of the entire customer base is revenue earning customers. It is very important for service provider to manage customer and concentrate on retaining the existing valued customer by creating more value to improved customer experience.

The service providers need to identify the unique needs of the individual customer and then attempt to develop services which satisfy those multifaceted needs. Carol Wilson (2009) stated that the telecom industry is no longer talking only about customer service but they are concentrating on customer experience, which include not just the conversations between customer service representative and customer but the full range of customer contact from service order to service delivery. It is analysed form the literature review that customer service is also one of the factor which is influencing the mobile user in order to select the service provider therefore the following hypothesis is formulated.

Hypothesis4 (H4): The Customer Service has a positive and significant effect in selecting the service provider

Family Monthly Income

Hypothesis5 (H5): Service Accessibility, Service Affordability, Promotional Offer and Customer Service factors will have a significant positive correlation towards each other for selecting the Mobile Service provider.

#### **RESEARCH METHODOLOGY**

Structural Equation Modeling is used as the main statistical technique. The methodology used to develop the instrument followed the guidelines given by Churchill (1979), Gerbing and Anderson (1988) and O'Leary-Kelly and Vokurka (1998). Data was collected through questionnaire survey. The questions in the survey are self created. 5 point likert scale was used (1 strongly disagree, 2 disagree, 3 nether agree or disagree, 4 agree and 5 strongly agree) to measure affects of Service Accessibility, Service Affordability, Promotional Offer and Customer Service for selecting the service provider. The research questions consisted of 23 questions. The first 3 questions are related to demographic variables age, gender and Family monthly Income. The remaining 20 questions are related to Mobile service accessibility, Service affordability, promotional offers and Customer Service. The questionnaire was pretested with a pilot study on a small sample size of 30 respondents to clarify the overall structure of questionnaire to test its consistence and reliability of questions to its research objective.

#### SAMPLING AND DATA COLLECTION

A total of 400 questionnaire forms were distributed to respondents in different parts of Andhra Pradesh for a period of 3 months from December 10<sup>th</sup> 2010 till March 8th 2011. A total of 361 questionnaires were analyzed for the research as other 39 questionnaires were incomplete. All the respondents are mobile phone users for at least one year and selected based on convenience sampling method. Respondents are clearly explained about the objective and purpose of the research article before distribution of the article.

The demographic characteristics of the customers are summarized in Table 1. Majority of respondents are males 207 (57.34%) and female respondents are 154 (42.66%). Majority of respondents are of age group 21 years to 30 years (40.17%).

Variable		Frequency	Percentage
Gender	Male	207	57.34
	Female	154	42.66
Age	Below 20 years	41	11.36
	Between 21 to 30 years	145	40.17
	Between 31 to 40 years	109	30.19
	Above 41 years	66	18.28

36.56

33.52

29.92

121

108

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

Between Rs. 10,001 to 25,000

Below Rs. 10,000

Above Rs. 25,001

#### **DATA ANALYSIS**

The data analysis was conducted in a three-stage process. First, reliability tests were performed. Upon satisfactory results, the factor analysis of the collected data was conducted followed by Confirmatory Factor Analysis (CFA) was performed to confirm the findings. SPSS Statistics 17.0 software is used to analysis the Content validity, Construct validity and Convergent validity of the model. Once the model was validated, SPSS Amos 18.0 software is used to test the overall fitness of the Structural Equation Model (SEM) and to estimate the relationships between the independent variables and the dependent variable so as to accept or reject the hypothesis.

#### **RELIABILITY TESTS**

The reliability of 20 items in the questionnaire is tested with Cronbachs' alpha (Cronbach, 1951). Cronbach alpha reliability coefficient is 0.855 which is exceeding the suggested level of 0.70 (Nunnally, 1978). It suggests that the questionnaire is having reliability and can be used for further analysis.

#### **EXPLORATORY FACTOR ANALYSIS**

The Kaiser-Meyer-Oklin (KMO) and Bartlett's Test is used to test suitability of data for factor analysis. KMO value was 0.852 exceeding the recommended value of 0.60 which can be considered as adequate (Kaiser and Rice, 1974) while Bartlett's Test of sphericity reached statistical significance (Approx. chi-square 2125.784, df 190 and Sig 0.00) which signifies the data is good for conducting factor analysis.

The 20 items were subjected to Principal Component Analysis (PCA) with varimax rotation to test the suitability of data for factor analysis. The items having factor loading less than 0.50 should be eliminated (Hair et al, 1996) but all factor loading each items are above 0.50 suggesting that the data set is appropriate (Stewart, 1981). So, all 20 items are accepted and PCA revealed that these 20 items are grouped into 5 components with Eigen values exceeding 1, explaining 5.388, 2.633, 1.939, 1.726 and 1.278 respectively. The total percentage of variance is 75.821. The individual dimensions of the proposed instrument explained total variance exceeding 60 percent, suggesting the appropriateness of the process. These components correspond to five constructs influencing the Mobile user in selecting the service provider in structural model – Service Accessibility, Service Affordability, Promotional Offers and Customer Service. The results of the Principal Component Analysis can be viewed in Table2.

#### **CONFIRMATORY FACTOR ANALYSIS**

According to Ahire, Golhar and Waller (1996) Confirmatory Factor Analysis (CFA) provides enhanced control for assessing unidimensionality than Exploratory Factor Analysis and is more in line with the overall process of construct validation. Unidimensionality measure the extent to which the items in a scale all measure the same construct (Venkatraman, 1989). In this study, CFA model is run through SPSS AMOS 18.0 software. CFA was conducted for each of the five constructs to determine whether the 20 indicators measured the construct they were assigned to adequately. Some of the important validity tests generally considered includes construct validity and Convergent validity.

#### CONSTRUCT VALIDITY

In the present study, in order to check for unidimensionality, a measurement model was specified for each construct and CFA was run for the entire construct. If a Comparative Fit Index (CFI) is 0.90 or above for the model implies that there is a strong evidence of unidimensionality (Byrne, 1994). CFI values for this construct are specified in table3. This indicates a strong evidence of unidimensionality for the scale.

#### **CONVERGENT VALIDITY**

It is the degree to which multiple methods of measuring a variable provides the same results (O'Leary-Kelly and Vokurka, 1998). Convergent validity can be established using a coefficient called Bentler-Bonett coefficient. The Bentler-Bonett Normed Fit Index (NFI) is 0.950 in this research which is obtained from CFA can be used to assess convergent validity. This index measures the extent to which different approaches to measuring a construct produces the same results (Hair et al, 1996). According to a rule of thumb, NFI values of 0.90 or greater than that indicates an adequate of model fit (Bentler, 1980).

TABLE 2: FACTORS EXTRACTION RESULTS OF THE ITEMS IN QUESTIONNAIRE

Item No	Component	Factor Loads	Eigen Value	% variance	
SER	/ICE PROVIDER (SP)	•		·	
SP1	I trust the service provider	0.741	5.388 26.940		
SP2	I have good opinion on the service provider 0.728				
SP3	The service provider has popular brand name	0.766			
SP4	The service provider has good network coverage	0.708			
CUS	STOMER SERVICE (CS)				
CS1	Customer care staff are reliable	0.722	2.633	13.163	
CS2	Customer care staff are helpful	0.756			
CS3	Customer care staff provide correct information	0.823			
CS4	Customer care staff provide prompt information	0.723			
SER	/ICE ACCESSIBILITY (SA)				
SA1	Customer service centre are easily accessible	0.771	1.939	10.696	
SA2	Customer service centre are in my near proximity	0.717			
SA3	Customer service centre are available every where	0.848			
SA4	Customer service centre provide quality service	0.743			
SERV	ICE AFFORDABILITY (SF)				
SF1	Call rates are economical	0.740	1.726	8.630	
SF2	Call rates are worth paying	0.821			
SF3	Tariffs schemes suit my budget plans	0.756			
SF4	Initial subscription cost is low	0.797			
Р	ROMOTIONAL OFFERS (PO)				
PO1	Promotional offers are attractive	0.789	1.278	7.391	
PO2	Promotional offers are useful	0.790			
PO3	Promotional offers are important	0.811			
PO4	Promotional offers are reliable	0.744			
Total	percentage of variance	75.821		•	

TABLE 3: DESCRIPTIVE STATISTICS FOR THE QUESTIONS IN THE SURVEY

Item No	Description	Mean	S.D
SP1	I trust the service provider	4.06	0.928
SP2	I have good opinion on the service provider	4.07	0.865
SP3	The service provider has popular brand name	4.10	0.889
SP4	The service provider has good network coverage	3.97	0.952
CS1	Customer care staff are reliable	3.53	0.998
CS2	Customer care staff are helpful	3.64	0.920
CS3	Customer care staff provide correct information	3.56	0.970
CS4	Customer care staff provide prompt information	3.46	0.954
SA1	Customer care service centre are easily accessible	3.30	1.121
SA2	Customer service centre are in my near proximity	3.05	1.115
SA3	Customer service centre are available every where	3.15	1.090
SA4	Customer service centre provide quality service	3.37	0.998
SF1	Call rates are economical	3.65	1.018
SF2	Call rates are worth paying	3.66	0.949
SF3	Tariffs schemes suit my budget plans	3.59	1.073
SF4	Initial subscription cost is low	3.66	1.028
PO1	Promotional offers are attractive	3.57	1.078
PO2	Promotional offers are useful	3.57	1.026
PO3	Promotional offers are important	3.47	1.021
PO4	Promotional offers are reliable	3.55	1.016

The following value are found in our study for each parameter to test model fit

TABLE4: PARAMETER VALUE FOR MODEL FIT MEASURES WITH SPSS AMOS

LET. FARAMETER VALUETOR MODELTH MEASURES WITH SESS A			
Name of the Parameter	Value		
Goodness of Fit Index (GFI)	0.961		
Adjusted Goodness of Fit Index (AGFI)	0.938		
Normed Fit Index (NFI)	0.950		
Comparative Fit Index (CFI)	1.000		
Tucker-Lewis Index(TLI)	1.018		
Incremental Fit Index(IFI)	1.012		
Relative Fit Index(RFI)	0.929		
Root Mean Square Error of Approximation (RMSEA)	0.001		

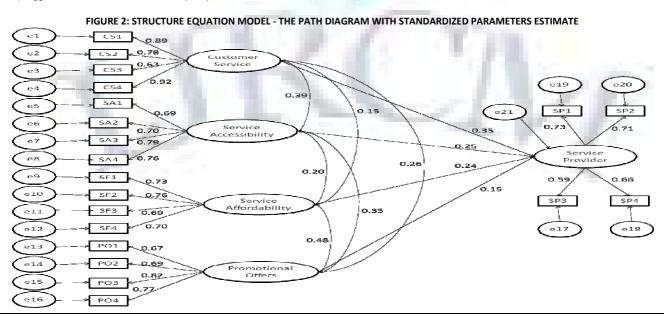
Based on various studies conducted by Bentler and Bonett (1980), Jöreskog, and Sörbom (1974), Bollen's (1989) and Bentler (1980) it was suggested that if the Index value is greater than 0.9 and if RMSEA values is less than 0.05 it indicates model is fit and accepted.

#### STRUCTURE EQUATION MODEL

SPSS Amos 18 software is used to perform confirmatory factor analysis using Structural Equation Model (SEM). Total number of variables in the model is 46, number of observed variables 20, number of unobserved variables 26. The data has no missing values. The model is over-identified, a preferable situation for SEM. According to the univariate and multivariate normality tests the data is not normally distributed. After the data was normalized, the Maximum likelihood (ML) estimation method is used. ML attempts to maximize the likelihood that obtained values of the criterion variable will be correctly predicted.

#### **MODEL FIT**

Based on Structure Equation Model using SPSS Amos 18 it is found that Chi-square(CMIN) = 108.485, Degree of freedom(DF) = 133 and probability level is about 0.941 which is evidence against the null hypothesis is not significant at the 0.05 level. CMIN/DF is called as the minimum discrepancy which is 0.816 Wheaton et al (1977) suggested that if the minimum discrepancy is less than 5 the model is reasonable fit.



#### **FINDINGS**

SPSS AmosGraphics has specified path-diagram in figure2 specifies the relationship between the 20 observered variables and 5 unobservered variable. The portion of the model that specifies how the unobserved variables are related to each other is called structural model. In this present structural model Service Provider is the dependent variable and the four variables Service Accessibility, Service Affordability, Customer Service and Promotional Offers are independent variable. The Regression weights estimates provides the relative importance. The estimates with the largest value represents the most important dimension in terms of its influence on overall Service provider selection. The findings of the regression weights estimates are summarized in table 5.

TABLES: STANDARDIZED REGRESSION WEIGHTS ESTIMATIONS

Factor	Direction	Factor	Estimate
Service Provider	<b> </b>	Service Accessibility	0.253
Service Provider	<b> </b>	Service Affordability	0.235
Service Provider	<b> </b>	Promotional offer	0.148
Service Provider	<b> </b>	Customer Service	0.354

Hypothesis1 (H1): The Service Accessibility has a positive and significant effect in selecting the service provider with Standardized regression weight of 0.253. So, Hypothesis1 is accepted.

Hypothesis2 (H2): The service affordability has a positive and significant effect for selecting the service provider with standardized regression weight of 0.235. So, Hypothesis2 is accepted.

Hypothesis3 (H3): The Promotional offers has a positive and significant effect in selecting the service provider with standardized regression weight of 0.148. So, Hypothesis3 is accepted.

Hypothesis4 (H4): The Customer Service has a positive and significant effect in selecting the service provider with standardized regression weight of 0.354. So, Hypothesis4 is accepted.

TABLE6: THE ESTIMATION OF CORRELATION AMONG EXOGENEOUS VARIABLES

Exogeneous Variables	Correlation	Exogeneous Variables	Estimate
Customer Service	<b>+</b>	Service Accessibility	0.393
Service Accessibility	$ \longleftarrow $	Service Affordability	0.203
Service Affordability		Promotional offer	0.481
Promotional offer	<b>←</b>	Customer Service	0.264
Customer Service	<b>†</b>	Service Affordability	0.149
Service Accessibility	<b>+</b>	Promotional offer	0.354

Hypothesis5 (H5): Service Accessibility, Service Affordability, Promotional Offer and Customer Service exogeneous variables which has a significant positive correlation towards each other as specified in table6. So, Hypothesis5 is accepted.

#### **DISCUSSION**

A review of literature revealed that Service Accessibility, Service Affordability, Promotional Offers and Customer Service are four important factors which are influencing the customer in selecting the service provider. This study provides a significant contribution to the theory by conducting factor analysis and Structure equation method to know the impact of these factors in selection of service provider.

Customer Service has the highest impact of 0.354 standardized regression weight on selection of service provider from the literature review it is known now retention of the customer is very important to service providing company than searching for a new customer because the cost of acquiring a new customer is more than retention of the old customer. All service providers are concentrating on customer service in order to retain the customer as especially after Jan 2011 where TRAI has implemented number portability in India. Now customers can retain his mobile number and easily change their service provider with minimum charges. So, customer service is very important factor at present scenario for selection of service provider.

Service Accessibility is the second factors which influence the customer in selection of the service provider with 0.253 standardized regression weights. Service Accessibility is availability of the network, SIM cards and customer service centre for customer. At present time where customer is looking for more convenient and easy methods for procuring the services, companies have launched easy recharge for talk time and established more customer service centers for easy accessibility to customer.

Service Affordability is the third factor which is influencing the customer for selecting the service provider with 0.235 standardized regression weights. Service Affordability is the tariff plans companies provide to the customer to use their service. At present due to huge competition companies has reduced their talk time cost in order to attract the customer. Customer is aware that all service providers are providing same price with slight modification in their packages.

Promotional Offers is the fourth factor which is influencing the customer for selecting the service provider with 0.148 standardized regression weights. Promotional offers have very less impact on selection of service provider because customers are aware that these promotional offers are purely to attract them for their service. Customers are always cautious in selecting the service provider based on the promotional offers.

Promotional Offers has high correlation with Service Affordability in selection of the service provider because generally promotional offers contain cost benefit for customer and there is very less correlation between Customer Service and Service Affordability.

#### **CONCLUSION**

This study used the Structured Equation model to understand the factors which are influencing the customer for selecting the service provider in India. There is a huge growth in mobile subscribers in India and heavy competition between the service providers, TRAI has implemented number portability due to which customers has a chance to select their own service provider keeping the mobile number unchanged. At present there is a very little research available to investigate the factors influencing selection of service provider in India. The findings of this study contribute to a better understanding of the relationship between Service Accessibility, Service Affordability, Promotional Offers and Customer Service to select the service provider. In particular, the finding in this research can help practitioners and academicians' to understand the level of impact that these factors has on service provider and the correlation between these factors. The result of this research predicts that Customer Service is most important factor than Promotional Offers which is influencing the customer to select their service provider.

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