An Empirical Assessment of Service Quality of Cellular Mobile Telephone Operators in Pakistan

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Abstract

Purpose: The purpose of this study was to examine the dimensions of users' perceived service quality of cellular mobile telephone operators in Pakistan.

Research design / methodology: A structured questionnaire, covering SERVQUAL dimensions of tangible, reliability, assurance, empathy, responsiveness, and additional dimensions of network quality and convenience, was used to measure mobile phone users' perception about service quality. Convenience sample of 800 mobile phone users was used to collect the data. Confirmatory factor and multiple regression analysis were conducted.

Finding: The adapted SERVQUAL with additional dimensions was found to be a valid instrument to measure service quality in mobile phone services. The dimensions of tangible, assurance, responsiveness, empathy, convenience, and network quality found to have positive and statistically significant relationship with mobile phone users' perceived service quality. Convenience and network quality dimensions found to be relatively most important dimensions affecting users' perception. The dimension of reliability did not reflect significant effect on customers' perception of quality.

Research limitations/implications: Convenience sample was used to measure mobile phone users' perception of service quality.

Practical implications: SERVQUAL is a valid instrument to measure service quality in cellular mobile telephone operators in Pakistan. Inclusion of additional dimensions and items make it more comprehensive for application in telecommunication services. The dimensions of network quality, convenience, and reliability are important aspects that need managerial attention to attract and retain customers. The regulators in telecommunication industry should take appropriate measure to include these dimensions in undertaking objective assessment of quality of service of cellular mobile telephone operators in Pakistan in safeguarding customers' interest.

Originality/value: Few studies on cellular mobile phone users' perception of service quality using SERVQUAL, and additional dimensions of convenience and network quality has been carried out in Pakistan. The current study has improved the understanding of mobile phone users' perception of quality for mobile phone operators, and regulators, beside its practical implications for telecommunication industry in Pakistan.

Keywords: Customer service quality, SERVQUAL, Mobile communication service, Pakistan

1. Introduction

A sound infrastructure in the telecommunication (telecom) sector is vital for sustainable economic growth of a country. Pakistan is a developing economy. In dynamic global environment, it is striving to bridge the digital divide and become competitive. In 2000, the privatization and deregulation policies adopted by the government have resulted in rapid growth of information and communication technology in the country.

Mobile phone service was introduced in the country in 1990. As a result of prudent policies of the government, the sector has witnessed phenomenal growth during the last 19 years. Pakistan Telecommunication Authority (PTA), a regulating body, indicated that Pakistan has experienced more than 150% continuous growth rate for years 2003-04 to 2005 -06. Mobile penetration has increased from 1.6% in 2003 to 58.2% in 2009; cellular teledensity has improved from 8.3% in 2005 to over 58.2 in 2009; the mobile phone subscribers have grown from .06 million in 1995 to over 98 million in 2009; and the number of cellular franchises have increased from 618 in 2003 to 1748 in 2009.

Pakistan cell phone market has potential to grow. The World Economic Forum (2010) initiates report about Network Readiness Index based on the essential factors that highlights the factors facilitating ICT readiness. The report for 2010 ranked Pakistan at 87 positions out of 133 countries. International Telecommunication Union (ITU), in ICT Development Index indicated that cell phone subscription per 100 inhabitants in Pakistan increased from 1.1 in 2002, to 38.4 in 2007 (ITU, 2009). In a study of use of cell phone in low income group in Pakistan, India, Thailand, Philippines and Sri Lanka found that more than 64% people in Pakistan do not own a cell phone. The study also reflects that more than 50% people show willingness to buy a cell phone. The study indicated the potential of cell phone market in rural areas and low income group (Hutchinson & Salazar, 2007). The World Banks also expects that all new cell phone customers will come from rural sector in the developing countries (Banjanovic, 2009). PTA (2009) expects subscriber of cell phone to reach 102 million in 2011. IE Market Research Corporation (IEMR), forecasts a growth of subscribers to 134.8 million by 2014(IEMR, 2010). Business Monitor International (2010) projects a growth of mobile phone users to reach 157.1 million by 2013 and penetration of 89% in the country.

Telecom Sector plays a significant role in the development of the country. According to State Bank of Pakistan (SBP), the contribution of this sector to gross domestic product rose from 1.6% in 2001 to 2.1% in 2008 (SBP, 2008). During last five years, the country attracted over United States $ 19 billion in foreign direct investment, of which 34% was in telecommunication sector. The sector contributes 6 to 7 % per annum in tax revenues to the government.

Presently six Operators and competing in cell phone market in Pakistan. Because of enormous potential of the market; the contribution it makes to the national exchequer, and the protection of customer rights, the study of perceived quality of service from customers' perspective becomes imperative. The existing surveys of quality of service conducted by PTA primarily focus on technical aspects of quality, about which customer has no experience and detailed knowledge. PTA surveys are based on the quality of service parameters include network accessibility, service accessibility, access delay, voice quality, and short message service (PTA, 2009). Customers are concerned with functional dimension of quality, the manner in which the services are provided and the experience of customers based on interaction with service provider (Oodan et al., 1997). This facilitates identification of the gaps and help organization in initiating necessary improving the gap between expectation and perception of service quality by customers.

In Pakistan, PTA regularly monitors the quality of services of mobile telephone operators through quality of service survey. The quality of service parameters include network accessibility, service accessibility, access delay, voice quality, and short message service (PTA, 2009).

In Pakistan, no empirical investigation or study has been undertaken to assess the functional quality of service based on customers' perception. Based on this, the study examines the quality of service of CMTOs as perceived by cell phone users in Pakistan. The study will discover the important dimensions of service quality that customers prefer. This will provide valuable insight to the decision makers of these organizations to initiate improvements in quality of service to remain competitive. The study will also help regulators to improve assessment of quality of service mechanism and manage customers' interest more objectively.

2. Literature Review

In dynamic business environment, the role of customer is changing (Prahalad & Ramaswamy, 2000). The changing paradigm of business has made the provision of quality of services as top priority for organizations. Customer-focused strategy has become a means of competitive advantage and survival for organizations (Taylor & Baker, 1994). Perceived service quality and its measurement has become essential focus for the organization in designing and implementing a customer oriented strategy (MacStravic, 1977). Reichheld and Sasser (1990) concluded that customer satisfaction is vital in attracting new customer and retaining the existing customers.

Researchers have emphasized distinct conceptualizations of quality (Holbrook, 1994). In operation management, reliability and fitness of use define quality; whereas in marketing and economics, attributes of products constitute quality. In services, quality is concerned with the overall assessment of the services (Parasuraman et al., 1988). Garvin (1988) identified performance, features, conformance, reliability, durability, serviceability, aesthetics, and customer perception of quality based on service provider's image.

Measuring service quality enables organization to know its position in the market and provides a strategic advantage to enhance its competitiveness. Measurement of service quality presents areas of strengths and weaknesses that offer opportunities to the organizations to initiate appropriate response to focus and improve salient attributes of customer perceived service quality. Through formal surveys of customers in different industries and focus group, Parasuraman et al., (1988) developed a list of characteristics that define service

quality in general. They combined these attributes into five major dimensions of service quality, namely; tangible, assurance, responsiveness, empathy, and responsiveness. These authors subsequently tested these dimensions through SERVQUAL; a 22-items scale measuring customers' expectations and perception on five dimensions to evaluate service quality. Berry et al., (1994) argued that SERVQUAL is an effective tool to steer organization in its pursuits of quality improvement by focusing on those areas that significantly contributes toward improvement.

Objective measurement of service quality is difficult because of unique characteristics of services (Zhao et al., 2002). Researchers have used different instruments to measure service quality. The most widely used instrument is SERVQUAL scale. This instrument has been used in different industries and cultures. Researchers have found this instrument valid and reliable in numerous studies (Babakus & Boller, 1992; Brown & Swartz, 1989; Cronin & Taylor, 1992, 1994).Some of these studies did not support the five factor structure of the instrument. Some researchers have criticized the instrument because of "its use of gap scores, negative wording used, measurement of expectations, positively and negatively worded items, the generalizability of its dimensions, and the defining of a baseline standard for good quality (Lai et al., 2007) SERVQUAL primarily focuses on gap-based scale to measure services quality; whereas Cronin and Taylor (1992, 1994) emphasized to use performance only index (SERVPERF). The SERVPERF measure has found strong support in the other studies (Babakus & Mangold, 1992; Teas, 1993; Brown et al., 1993). The researchers have argued that cultural difference is an important aspect that affects the customers' expectations of service quality (Donthu & Yoo, 1998; Kettinger et al., 1994; Mattila, 1999); hence the relevancy of SERVQUAL in different cultures is also an issue. To improve reliability and validity of SERVQUAL, some researchers have merged expectations and perceptions into a single measure and tested it with excellent results (Babakus & Boller, 1992; Andaleeb & Basu, 1994; Dabholkar et al., 2000). Dabholkar et al., (2000) and Wang et al., (2000) proposed factors associated with service quality (e.g. tangible, reliability, assurance, responsiveness and empathy) and have described as antecedents of customers' perceived service quality and validated and tested these factors.

SERVQUAL has been widely used in telecommunication industries in different cultural context with high reliability and validity (Hoffman & Bateson, 2001; Tyran & Ross, 2006; Stafford et al., 1998; Sureschander et al., 2002). In a study of mobile telecommunication in South Africa, Van der Wal et al., (2002) used SERVQUAL with some modifications. The modified instrument resulted scale reliability of 0.95. In their study of service quality in telecommunication services, Ward and Mullee (1997) used reliability, availability, security, assurance, simplicity, and flexibility as criteria of service quality. They argued that, from customers' perspective, it is not appropriate to separate network quality from the other dimensions of quality.

Quality of services from mobile phone users' perspective need to be studied with a view to facilitate its measurement. Numerous studies have investigated the perspective of mobile phone users with regard to the quality aspects. These have been discussed in succeeding paragraphs. These studies provide insight to the quality dimensions that mobile phone operators need to consider to remain competitive in changing environment.

Global System for Mobile Communication (GSM) Association identified a list of indicators for mobile phone quality of services. These indicators included network access, service access, service integrity, and service retainability (Sutherland, 2007, p. 20).

J.D. Power and Associates Survey (2009) studied the mobile phone users' satisfaction in the United Kingdom. The study used a sample of 3325 mobile phone customers throughout United Kingdom. Important dimensions of service quality included in the survey were coverage, call quality, promotions and offerings of incentives and rewards, prices of service, billing, customer, bundled services. The study showed rising customer expectations with regard to the additional features and services from the mobile operators.

Based on the survey of 22052 users of wireless phone in the United States in 2008, the Wireless Phone Users' Satisfaction Index of United States of America indicated that important dimensions of service quality included customer satisfaction, billing, brand image; call quality, cost of service and options for service plans (Customer Satisfaction Index, 2009)

A qualitative (focus groups) and quantitative (consumer surveys) research study about consumer satisfaction was undertaken by Australian Communications and Media Authority, ACMA (2008). The study reported highest levels of dissatisfaction with mobile phone services (35 per cent), citing problems such as drop-outs, poor call quality and interference.

Accenture (2008) carried out survey of 4189 consumers in Australia, Brazil, Canada, China, France, Germany, India, United States, and United Kingdom. More than 67% respondents confirmed poor customer services as the

core reason for leaving the operators. The survey also found the rising expectations of customers in mature and growing markets.

In 2008, Telecom Regulatory Authority India carried out quality of service survey of mobile operators based on users' satisfaction. The sample consisted of 1318 mobile phone users. The important dimensions of regulatory services benchmark dimensions of service quality included billing, customer care, availability of network, value-added services and pre-sales and sales dimensions. Out of 11 operators, only five operators achieved the 90% service quality benchmark (Survey, 2008).

Souki and Filho (2008) carried out a study based on 434 customers in Brazil. The study focused on satisfaction of mobile phone users. The results of the study indicated high rating of customers' services, quality of connections, ambience of outlets, and the coverage provided.

A study of 10 regions in Japan measured the customer satisfaction among 7500 individual mobile telephone service users. The important dimensions of service quality of mobile service providers included handset, price, quality of call, coverage of area, non-voice functions and services, and customer contact strength in that order of priority (Mobile Phone Survey, 2004).

Barnhoorn (2006) carried out a study in 2008 in South Africa indicated the ever increasing expectations of customers with regard to the services of mobile phone operators. The salient dimensions of quality of service accorded priority by mobile phone users included courteous and facilitating role of front-line personnel, ease of availability for cards and recharge services, availability of products and services at the company outlets, accurate information and facts about services, affordable prices of the packages, and customized services.

A study by Sukumar (2007), using a sample of 104 mobile phone subscribers, measured the mobile phone users' preferences for selection of an operator. The result of the study found important dimensions as brand image, customer care, services availability, credit facility for connection, deposit amount, and prices in that order of priority.

In Canada, the consumers' satisfaction survey in 2007 based on the responses of 6000 mobile phone users indicated the essential elements of service quality of mobile operators as quality of calls, prices, billing, customers' services, and diversity of bundled options of services (Customer Satisfaction, 2007).

A study was undertaken in 2007 on Consumer Satisfaction in Telecommunication markets in the Organization of Economic Cooperation and Development (OECD) countries by the Directorate for Science, Technology, and Industry (DSTI) Committee on Consumer Policy. The study found imperfect information on quality and price, lack of transparency in roaming charges for international in service and contractual binding in changing the operators affect consumer behaviour. The study focused on mobile phone users and identified and found that quality of service and price were two major factors for switching over to new operators. The study further highlighted that major factors affecting mobile phone users' dissatisfaction included lack of differentiation in United Kingdom, prices and quality of services in Portugal, early termination fee and unsolicited calls and inaccurate billing in United States, and lack of meeting and exceeding customer's satisfaction in Australia (DSTI, 2007).

A study of mobile phone customers satisfaction about quality dimensions was undertaken in 2006 in Finland and other Scandinavian (Denmark, Sweden) and Baltic (Lithuania and Latvia) countries. The important drivers of customers' perception of quality emerged product and service in Scandinavian and Baltic countries. The results found that the significant aspects of quality of service included attributes of service, image of the operators, and value-added services. Pricing of the services emerged as the most important dimension of quality (ESPI, 2006).

Sigala (2006) noted, in a study of mobile phone users in Greece that customization of service, pleasing interaction of staff and customers, company's image and differentiated features were the important dimensions of service quality of mobile phone users.

In Turkey, a study was undertaken to determine the National Customer Satisfaction Index of mobile phone users based on a sample of 1950 mobile phone subscribers. The dimensions that emerged in customer satisfaction included meeting customers' pre-purchase expectations, perceived quality (coverage, responsiveness to customers complaints, value-added services, promotional activities and their fulfillment), and complaint handling (Ozer & Aydin, 2005)

Consumer Surveys (Cap Gemini, 2005; McKinsey Quarterly, 2004; Consumer Reports, 2005) found that network quality based on data services and voice services strongly influence customer satisfaction and loyalty with regard to the use of mobile phone.

Based on the literature review, the research posits following hypotheses and theoretical framework of the model:

H 1: Tangible has positive and significant relationship with perceived service quality.

H 2: Reliability has positive and significant relationship with perceived service quality.

H 3: Responsiveness has positive and significant relationship with perceived service quality.

H 4: Assurance has positive and significant relationship with perceived service quality.

H 5: Convenience has positive and significant relationship with perceived service quality

H 6: Empathy has positive and significant relationship with perceived service quality.

H 7**:** Network quality has positive and significant relationship with perceived service quality.

3. Methods

3.1 Instrument Development

The 22 items SERVQUAL instrument covering tangible, assurance, responsiveness, reliability and empathy was modified to suit peculiar environment of telecommunication industry in Pakistan. In addition, the dimensions of network quality, and service convenience were incorporated in the instrument because of its importance and validation in earlier studies. During pilot study, the respondent strongly supported these two dimensions and considered it vital for perceived service quality of mobile phone. The items for network quality, service convenience, and service quality were adapted from Negi (2009). The final instrument contained 28 items**.** Five points Likert rating scale ranging from strongly agree (5) to strongly disagree (1) was used in the study.

3.2 Pilot Testing of Instrument

To validate the instrument, a convenience sample of 60 mobile phone users was selected. The Cronbach's alphas for variables used in the instrument ranged from 0.819 to 0.873. The results reflected adequacy of the questionnaire as recommended by Nunnally (1978).

3.3 Sample and Data Collection

Five Cellular Mobile Telephone Operators with 99% of market share were selected for this study. All employees of these organizations were the target population. A convenience sample of 800 mobile phone users of all CMTOs had been used. The survey was administered using different means (e-mail, personally delivered and through third party). A total of 650 filled questionnaires were received, which represented 81.25% response rate, and had been used in the data analysis.

3.4 Reliability and Validity of Instrument

To test the reliability of the instrument, Cronbach alpha relating to all dimensions was computed. Of five dimensions of SERVQUAL, the Cronbach alpha coefficient range from 0.793 to 0.867, which are higher than as suggest by Nunnally and Brenstein (1994). The scales of network quality, and service convenience demonstrated high internal consistency with Cronbach alpha coefficient of 0.819 and 0.793 respectively.

3.5 Data Analysis

Both descriptive and inferential statistics has been used to analyze the data. Statistical Package for Social Sciences (SPSS-version 16) software has been used in the analysis.

3.6 Results and Analysis

3.6.1 Results of descriptive statistics

The study commuted the results of descriptive statistics based on arithmetic mean and standard deviation of different dimensions of perceived service quality of mobile phone users used in the instrument. The descriptive statistics for tangible (*Mean* = 3.86, *Standard Deviation* = 0.505); reliability (*Mean* = 3.79, *Standard Deviation* = 0.610); responsiveness (*Mean* = 3.58, Standard *Deviation* = 0.635); assurance (*Mean* = 3.50, *Standard Deviation* = 0.748); convenience (*Mean* = 3.68, *Standard Deviation* = 0.668); empathy (*Mean* = 3.62, Standard *Deviation* = 0.646); network quality (*Mean* = 3.64, Standard *Deviation* = 0.757); and perceived service quality (*Mean* = 0.374, Standard *Deviation* = 0.496) reflect concurrence. The results varied from 0.350 (lowest) for assurance to 3.86 (highest) for tangible dimension. All the constructs drew general agreement with regard to the responses in the sample. The profile of respondents is at Table 1.

Insert Table 1 Here

3.6.2 Results of reliability and validity of data

The Cronbach's alpha for individual variables of tangibles (0.758); reliability (0.801); responsiveness (0.810); empathy (0.874); convenience (0.860); assurance (0.821); and network quality (0.831); indicated that the measure is compositely reliable and internally consistent as recommended by Nunnally (1978). The reliability of the instrument of this study is 0.896, indicating a high reliability factor as compared to the reliability factor of 0.92 of initial study by Parasuraman et al., (1988).

3.6.3 Results of test of normality of data

Researchers have advocated undertaking analysis to establish the multicollinearity among variables. The results of multicollinearity analysis reflected that Tolerance levels (< or equal to 0.01), and Variation Inflation Index (VIF) value (below 10) were within desired range. In addition, Durbin Watson for all variables were (between 1.5 and 2.5) was within acceptable limits. The results reflect that no multicollinearity exist between variables.

3.6.4 Results of Correlation Analysis

The results of the study reflect that all factors have positive correlations. Table 2 indicates that the relationship among variables is significant ($p < 0.001$).

Insert Table 2 Here

3.6.5 Results of factor analysis

Confirmatory factor analysis was done to validate the constructs underlying structure of the model. Kaiser-Meyer-Oklin (KMO) static and Bartlett's Test of Sphericity was carried out. The KMO value (KMO = 0.872) reflected degree of common variance among variables was excellent (Malhotra, 2004). The Bartlett's test of sphericity indicated Chi square 3.356 with an observed significance level ($p < .001$). Principal axis factor as the factor extraction method and Oblimin rotation with Kaiser normalization as rotation method was used in exploratory factor analysis. The results in Table 2 reflect seven factors with eigenvalues greater than 1.0. The seven factor model explained 66.27% of total variance, which is higher than 0.50%. The factor loading less than 0.50 was not considered. The results reflect that seven factor model used in the study is adequate (Nunnally & Brenstein, 1994). Table 3 shows the results of factor analysis.

Insert Table 3 Here

3.6.6 Results of Regression Analysis

The result of regression equation based on seven independent variables (tangible, assurance, convenience, reliability, convenience, empathy, and network quality is reflected in Table 4. The results indicate positive and statistically significant (F=74.117, $p < 0.001$) relationship of these variable with perceived service quality except reliability. These variable accounted for 68.2% ($R^2 = 0.682$) of variance in perceived service quality. The relationship of tangibles, assurance, responsiveness, convenience and network quality is positive and statistically significant ($p < 0.001$). The relationship of empathy dimension is also positive and statistically significant (p 0.05). The relationship of reliability with perceived service quality is positive but not statistically significant ($p >$ 0.05).

Insert Table 4 Here

4. Discussion

The objective of the study was to assess what mobile phone users perceive the important dimensions of service quality in the services offered by CMTOs in Pakistan. The analysis identified seven dimensions (tangibles, reliability, responsiveness, convenience assurance, empathy, and network quality). These dimensions have been identified and validated in prior research on service quality (Parasuraman et al., 1985, 1988). In addition, these dimensions have their own unique characteristics in mobile phone context.

The tangible dimension refers to the quality of physical infrastructure, the equipment available to make the service a delightful experience, the outward show of people providing the service. Mobile customers expect that the outlets' interior décor and design would be appealing (Zeithaml & Bitner, 2000). The customer want that information material provided is well composed, and attractive. The frontline personnel providing services at the outlets should be neat, clean, and well dressed and give pleasing look (Chi et al., 2008). Barnhoorn (2006) stressed that communication facilities and other equipment at these outlets are modern and up-to-date, and easy availability of cards and recharge services and provided.

The dimension of reliability entails provision of service accurately and dependably. The mobile phone users expect that the CMTOs provide them accurate service as promised (Chich et al., 2006). The mobile phone users

want accurate and timely billing. Sigala (2006) emphasized customers' desire the staff to be sympathetic, facilitating, and reassuring to their needs. The customers expect that their record of use of service is kept accurately and readily available (Ozer & Aydin, 2005).

Responsiveness accounts for a prompt response to the customers' needs. Gerpott et al., (2005) stressed the need of timely service to the mobile phone users. The frontline employees are expected to anticipate the needs of the users and proactively respond to these needs (Lee et al., 2001). Mobile phone users are keen to get a prompt response from the employees regarding their complaints and enquiries. To this effect, the CMTOs need to establish effective mechanism for quick handling of enquiries and efficient customer services (Lim, 2005).

Assurance focuses on the expertise of the employees about the multifaceted knowledge about the service offering, courtesy, and their ability to instill faith and dependence in the service providers' competence. Lee et al., (2001) argued in favour of facilitating role of staff in dealing with customers. They stressed that staff should have the competence to inspire trust and confidence among the customers about the ability of cell phone service providers in anticipating and meeting customers' needs. Sigala (2006) stressed that politeness of staff builds trust in the service provider ability to respond to the needs of the customers.

Convenience involves ease of access to the customers. In today's busy working schedule, customers do not want to waste unnecessary time in reaching out to the service provider. Lim (2005) emphasized that customer accords priority to convenient hours of operation and convenient locations of cell phone providers' outlets. Kim et al., (2007) found that customers prefer ease of access and convenient operating hours in selecting cell phone operators.

Empathy necessitates placing customers over and above everything else during the course of staff interaction. Lim (2005) highlights that caring and personalized approach in dealing with customers provide them a pleasant experience and helps builds long term relationship with cell phone service provider.

Network Quality has emerged as critical dimension that forms customers' perception of service quality of cell phone service provider. Chi et al., (2006) identified that voice quality and least drop calls are critical in evaluation service quality. Lai et al., (2007) concluded that network coverage, all-time availability, and no drop calls are important aspects that affect customers' perception of cell phone service quality.

4.1 Relative importance of mobile phone service quality dimensions

An evaluation of relative importance of mobile phone service quality dimensions is essential to identify the effects of these dimensions on customer perception of mobile phone service quality. This would enable CMTOs to identify and undertake necessary initiatives to improve those aspects that customers value the most. The results of regression analysis in Table 4 indicate that convenience, and network quality is the most dominant dimensions in affecting the customers' perception of mobile phone service quality. This would enable CMTOs to identify and undertake necessary initiatives to improve those aspects that customers value the most.

The results of regression analysis in Table 4 indicate that convenience, network quality, assurance, responsiveness, and empathy are dimensions that have positive and significant impact on customers' perceived service quality of mobile phone service providers. The results of the study concur with the outcome of other studies on traditional service quality setting (Bitner, 1990; Parasuraman et al., 1988). The results of this study are in harmony with research of customers' perceived service quality in mobile phone industry (Joachim & Omotayo ,2008; Johnson & Sirikit, 2002; Lai et al., 2007; Negi, 2009; Leisen & Vance, 2001; Pampllis et al., 2002; Wang & Lo, 2002).The reliability dimension has positive association but its effect on customers' perception is not statistically significant. For mobile phone users, the consistency and dependable service is extremely important. In competitive environment, mobile phone service providers need to ensure that right service is provided the first time (Lai et al, 2007). It is critical for mobile phone companies to honour their promises in fulfilling users' requirement (Negi et al., 2009). The lack of significant relationship with service quality is a cause of concern for mobile operators, because reliability directly affects the credibility and reputation of mobile operators and results in dissatisfaction of customers with its strategic significance (Joachim & Omotayo, 2008). Once trustworthiness of the service provider is compromised, the organization suffers from reduced market share, diminished revenues, and profitability (Parasuraman, 1988). The insignificant effect of reliability of mobile operators' services is a cause of concern and need immediate response to restore the trust and creditworthiness among mobile phone users.

5. Conclusion and managerial implications

The competitive environment in mobile phone industry in Pakistan has become intense. Mobile operators are vigorously investing in network coverage, upgradation, and quality, competitive pricing, and diversified offering

to attract new customers and retain the existing customers. The results of this study substantiate the response strategy of mobile phone operators to enhance quality of network, the tangible, responsiveness, and assurance, empathy, and convenience dimensions of services that are vital to affect the customers' perception of quality of service.

The proactive role of PTA, consumers' awareness to higher quality of services, and the prospects of new entrants in the market will enhance the existing level of competition. The emerging competitive market environment will offer challenges to mobile phone operators to proactively pursue customer focused strategy for building and sustaining competitive advantage based on benchmark quality of service dimensions that the results of this research indicate.

The results of the study reflect that the issue of provisioning of promised service, timely, accurately, and dependably will need highest priority. Earlier researches indicate that reliability positively and significantly affects customers' perception of service quality of mobile phone users (Lai et al., 2007; Negi et al., 2009). Because the reliability has been established as the driver of mobile phone service quality, Mobile operators will need to pursue two pronged strategy with internal focus on improved processes, and external focus on customers' needs. An aggressive strategy is needed to enhance the trustworthiness of mobile phone operators by keeping customers' best interest at heart, providing customized services and exemplary behaviour of contact personnel to make the interaction a memorable experience. The mobile operators should also focus on other dimensions of tangible; responsiveness, assurance, and empathy because these aspects significantly affect customers' perception of service quality of mobile phone service provider.

Employees play a leading role in telecommunication service. The role of frontline staff becomes extremely important in making the interaction with customer pleasing. The staffs need to know the importance of their role in service delivery. Management should ensure that human resources dimensions are addressed to optimize the service delivery by staff.

The study established that SERVQUAL with additional dimensions is a reliable instrument for measurement of service quality dimensions in telecommunication industry in Pakistan.

The results of this study concur with the findings of earlier researches in mobile phone industry that the dimensions discussed in the study have positive and significant effect on mobile phone users' perception of service quality (Joachim & Omotayo, 2008; Lai et al., 2007; Negi, 2009; Leisen & Vance, 2001; Wang & Lo, 2002).

Changing customers have made the service quality a fluid phenomenon. The competitive environment demand constant assessment of service quality to meet rapid changes in customers' demand. It is essential that service quality of mobile phone users be evaluated on regular basis to identify weaknesses, and emerging trends in the service. The regular service quality assessment enables organizations to align to the changing customers needs (Dutka & Frankel, 1993).

5.1 Limitations and future research

Despite the contribution of the study, it has several limitations. The study was based on a convenience sample. Though data collection procedure produced reliable and valid results, use of random sample is essential to determine the generalizability of the results. Because SERVQUAL dimensions primarily deals with customer handling, additional features and items need to be included and examined for their relevance to the mobile services. Further research should be conducted to examine the applicability of SERVQUAL instrument in other industries in Pakistan, both manufacturing and services.

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Table. 1 Respondents' Profile

Characteristics	Percentage %
Gender	
- Male	66
- Female	34
Age (in years)	
- Below 18	20
- 18 to 30	36
- 30 to 45	30
- 45 and above	14
Education	
- Ph D	6
- Master	36
- Bachelor	40
- Intermediate	12
- Matriculation	6
Profession	
- Professional	44
- Businessmen	38
- Students	18
Number of years of service usage	
- Less than 3	16
- 3 to 5	28
- 5 to 10	42
- Above10	14

Table 2. Correlation Matrix

Variables	Tangibles	Reliability	Responsiveness	Assurance	Convenience	Empathy	Network Aspects
Reliability	.413**						
Responsiveness	.346**	.491**					
Assurance	.590**	.525**	.498**				
Convenience	.390**	.399**	.396**	.490**			
Empathy	.318**	.469**	.454**	.437**	.367**		
Network Aspects	.320**	.347**	.348**	.336**	.229**	.485**	
Service Quality	.573**	.542**	.558**	.592**	.558**	.558**	..534 **

Significance level, **, $p < 0.001$(two tailed)

Table 3. Confirmatory Factor Analysis

Item	Tangible	Reliability	Responsiveness	Assurance	Empathy	Convenience	Network Quality
T1	.724						
T2	.586						
T3	.546						
T4	.701						
T5	.711						
R1		.738					
R2		.809					
R3		.750					
R4		.687					
RP1			.673				
RP2			.660				
RP3			.759				
RP4			.511				
AS1				.788			
AS2				.795			
AS3				.746			
AS4				.543			
CN1					.654		
CN2					.755		
CN3					.680		
CN4					.694		
EM1						.633	
EM2						.658	
EM3						.793	
EM4						.613	
NQ1							.803
NQ2							.779
NQ3							.813
-Eigen value	8.24	2.68	2.50	2.20	1.57	1.32	1.21
-%Variance Extracted	23.56	10.45	9.85	7.62	6.58	4.32	3.89

Note: Factor analysis: Principal axis factoring and Oblimin rotation with Kaiser normalization. Factor loading below 0.50 are not reflected.

Table 4. Results of Regression Analysis

Variables	Proposed Effect	Path Coefficient	Observed t-value	Significance level
Tangible	+	.135	3.368	**.001
Reliability	-	.087	1.912	.057
Responsiveness	+	.149	3.374	**.001
Assurance	+	.169	3.649	**.000
Convenience	+	.244	5.879	**.000
Empathy	+	.129	2.881	*.004
Network Quality	+	.234	5.691	**.000

Significance level, **, $p < .001$, *, $p < 05$