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Measuring the Service Quality of Mobile Phone Companies in Saudi Arabia

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Abstract. The purpose of this study is to measure the service quality of mobile phone companies operating in a developing country, Saudi Arabia by using the SERVQUAL instrument. A questionnaire survey was conducted. Data was collected from business college students at a leading university in Saudi Arabia. Confirmatory factor analysis and MANOVA were applied to test the results.

The adapted SERVQUAL instrument is a helpful tool in measuring service quality. Results based upon factor analysis exhibited significant differences in customers' perceptions of the overall service quality of various companies. Two added dimensions of network quality and competitive advantage also showed significant results. There was a difference of perception between male and female subscribers concerning quality dimensions.

This research is a valuable contribution to existing literature on service quality in Saudi Arabia with special reference to mobile phone companies. This is a pioneering study that measures the quality of service in this area in Saudi Arabia. It also reveals clear differentiation in customers' preferences in almost all dimensions.

I. Introduction

In today's fast business environment, a firm cannot play a successful role without delivering high service quality. The interest in service quality has grown in recent years as it is a major factor in business competitiveness. The service sector has become the most important sector for many developed and developing countries and is a major contributor towards the GDP. Many studies have been carried out since 1980 to measure the service quality of an organization or sector. Measurement of service quality has become more important due to the fact that it can identify the problems and the solutions leading to better performance, which can then increase market share of the company and its short and long-term profits.

The telecommunication sector is one of the most important sectors of an economy, and high quality service in the telecommunication industry can lead to growth and long-term development of any country. Mobile communication is emerging as the fastest

growing area in telecommunications.

By 2008, in developing countries, cellular (mobile) phones had reached an estimated 49.5 percent penetration rate (International Telecommunication Union 2009). Mobile subscriptions have surpassed the fixed line subscription by quite a large margin. The International Telecommunication Union reports that there were around 400 million mobile subscriptions in the year 1998 which jumped to the 4 billion mark in 2008, globally. This dramatic worldwide change has resulted from technological changes with the introduction of cellular communication and the internet and from the market shift, as monopolies are discouraged and the companies are forced to enter the competitive environment.

1.1 Telecommunication Industry in Saudi Arabia

Saudi Arabia has one of the largest economies among all Middle Eastern countries with a population of almost 28 million inhabitants (Population Reference Bureau 2008), and it enjoys a high income level supported by a steady annual economic growth that is around 4.4 percent (Global Finance Magazine 2009). With a huge, wealthy population, there is plenty to attract mobile operators. Saudi Arabia has improved its position from 73rd in 2002 to 55th in 2007 in mobile telecommunication services (International Telecommunication Union 2009). It has observed an outstanding growth for the last five years. Saudi Telecom Company (STC), established in 1998, is the leading and oldest mobile service provider in Saudi Arabia. Although the company has enjoyed its monopolistic position in the country for many years, the market is rapidly becoming more competitive with other companies, namely Mobily and Zain, trying to capture some of STC's market share.

The mobile subscriber base in Saudi Arabia showed an increasing trend in the third and fourth quarters of 2008 and the first and second quarters of 2009. It reached a 7.2 percent growth rate in the second quarter of 2009, while the total subscription base of customers remained at 37.47 million. Up until June 2009, STC had been the leader in operation with 20.12 million subscribers. However, the other competitors, Mobily and Zain, have been gaining more subscriptions each quarter. The highest growth in the subscription base has been attained by Zain because of the small base and intensive marketing campaign it has launched in recent months. Zain has increased its market share from 3.2 percent in the third quarter of 2008 to 10.13 percent in the second quarter of 2009, largely at the expense of the STC which had a decrease in market share from 61 percent in the third quarter of 2008 to 53.7 percent in the second quarter of 2009 (Global Investment House 2009).

While the mobile communication industry is one of the most important service markets in Saudi Arabia, the measurement of service quality in this sector has been neglected by previous studies. The objective of this study is to focus on the measurement of service quality of mobile companies in Saudi Arabia by utilizing the SERVQUAL model with slight modifications.

2. Literature Review

Researchers around the world recognize the importance of service quality and the fact that it can provide an organization a long term competitive advantage (Moore, 1987). This is because when there is a tendency for others to outperform an organization, the service quality performances must be compared to a set of standards in an organization in order to meet the stiff competition (Brown, 1997). Management of service quality has depended largely on the right balance between technique and methods used for the improvement of the systems, staff attitudes, behavior, and service culture (Edvardsson *et al.* 1994). Although there is a general agreement among researchers that service quality is a multi-dimensional phenomenon (Cronin and Taylor, 1992), how to conceptualize the service quality in the best possible manner is a debatable issue (Parasuraman *et al.* 1994; Teas, 1994).

A number of instruments have been developed to measure the quality of service provided by an organization. Numerous instruments have been developed to measure service quality. The SERVQUAL model, developed by Parasuraman, Zeithamal, and Berry (1985), and subsequently refined in 1988, 1991, 1993 and 1994 (Parasuraman *et al.* 1988, 1991, 1993, 1994), is one of the most acknowledged and widely used measures of service quality. Another model, The SERVPERF, was developed by Cronin and Taylor (1994), while Vaughan (2001) developed the ARCHSECRET model. The list of dimensions uncovered in SERVQUAL studies were divided into five categories: tangibility, reliability, responsiveness, assurance, and empathy.

Many studies have been conducted to test SERVQUAL's validity and reliability (Babakus and Boller, 1992; Bolton and Drew, 1991; Brown and Swartz, 1989; Carman, 1990; Cronin and Taylor, 1992, 1994). A multi sector study emphasized that

the original SERVQUAL instrument is reliable and valid. This study was conducted by Parasuraman *et al.* (1991) utilizing data from 1,936 consumers from three service industries. Carman (1990) has tested SERVQUAL dimensions and measures and found the stability of SERVQUAL dimensions to be impressive. This test was conducted on 800 consumers taken from four different firms. Another study (685 computer users) by Pitt et al. (1995) revealed that SERVQUAL passed content reliability and convergent validity exams. A further study done on 630 travelers in four restaurants found that the model provides satisfactory levels of reliability (Heung and Qu Hailin, 2000). Lam (1995) also reiterated that SERVQUAL is a consistent and reliable scale with which to measure quality.

The SERVQUAL instrument proved appropriate and, to that end, should be used more extensively in educational environments (Du Plessis and Boshoff, 1994). As a well established model, it has been considered a consistent and reliable scale with which the service quality can be measured effectively.

This model has been widely applied in many service sectors including healthcare, public services, higher education, telecommunication, telemarketing and banking, and has remained popular with the researchers for last two decades (Keuh and Voon, 2007). Choi and Chu (2000) applied this model on air travelers, while Angur et al. (1999) and Kumar et al. (2010) used it for the banking services industry. Lam (1997) and Zaim (2010) applied SERVQUAL to measure the service quality of hospitals in terms of patients' perceptions. Kuo (2010) has successfully used this model to ascertain the service quality of insurance companies in Taiwan. It was also used to assess the service quality of private universities in Bangladesh by Chowdhury et al. (2010). Smith et al. (2007) employed it to measure service quality of higher education institutes in United Kingdom. SERVQUAL model was also applied to assess the service quality of the restaurant industry of Pakistan (Shaikh, 2009).

Researchers have widely used SERVQUAL to measure service quality and have applied the model with much modification internationally (Leisen and Vance, 2001). This model can be used in different industries with different cultural settings. However, from the beginning when SERVQUAL was first developed in Western countries, the applicability of SERVQUAL was an issue when considering different cultures. While investigating the multi-dimensionality of service quality in other countries, Kettinger *et al.* (1994) recommended that researchers take cultural variances into account. Mattila (1999) suggested that Asian consumers are less likely to rely on tangible cues than those of a Western cultural background. Espinoza (1999) studied the cultures of consumers in Latin America and North America and found a clear difference between these two groups regarding the importance of service quality dimensions.

Although telecommunications industry has undergone a massive change around the world but the aspect of service quality still needs further emphasis in this field (Leisen and Vance, 2001). In fact, some limited work on this subject has already been reported in the literature. In fact, the mobile companies should focus on the service quality more than before and must provide the value added services to retain their customers (Aydin and Ozer, 2005).

In this industry, SERVQUAL model was also used to measure the service quality of the different service providers. Van Der Wal *et al.* (2002) applied it on the South African cellular phone companies, while Khatibi *et al.* (2002) used the same tool to measure the service quality and customers' loyalty in Malaysian telecommunication industry. Lai et al. (2007) found SERVQUAL model appropriate to measure the service quality in the China's mobile companies. Peter (2004) conducted a survey of consumers for the Verizon cellular company in the U.S. The study suggested that consumers give higher marks to Verizon for its better coverage, after sales services and call quality. Consumers were still unhappy with charges for canceling services and areas which were not covered by Verizon.

A research conducted by Tung (2010) on customer satisfaction and perceived quality of Taiwan's mobile phone companies revealed that perceived expectations, quality, value, image, and ease of use are the most important factors for customer satisfaction regarding the cellular phone services. Almost the same conclusion was drawn in the Malaysian telecommunications sector as Ismail and Abdullah (2001) reported the relationship between perceived service value and customer satisfaction. On the other hand, Chandha and Kapoor (2009) found out that the switching cost and service quality as the main factors behind customers' satisfaction and loyalty.

Lai *et al.* (2007) conducted a survey of China's mobile communication industry and suggested that the SERVQUAL instrument is a valuable tool for measuring service quality. They also recommended that improvements in some SERVQUAL dimensions may be helpful for better explication.

A study conducted by Khatibi et al. (2002) revealed that there is a significant relationship

between customer satisfaction and service quality in Malaysia's telecommunication industry. Furthermore, he concluded that improvement of overall service quality will have a positive effect on customer loyalty. Another study of the South African cellular companies by Van Der Wal *et al.* (2002) indicated that two of the dimensions, tangibility and reliability, are two separate factors, while the remaining three dimensions, responsiveness, assurance and empathy, are considered to be one factor, showing no real differences among these three dimensions in customer perception.

Sridhar and Piyush (2004) considered service quality to be an important factor in determining the competitiveness of service providers. They concluded that infrastructure and customer service are two important dimensions. Overall quality and infrastructure address issues like voice quality, network coverage, call completion rate, and call dropping percentage, etc. Pezeshki *et al.* (2009) consider service quality and network performance as the major strengths and a source of customer satisfaction.

In the Gulf Cooperation Council (GCC) region which encompasses six states: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates (UAE), some research has been done on several industries/sectors. A cross cultural study was conducted by Buda *et al.* (2006) on US, Kuwait and Saudi Arabia to judge the employee and organizational perspectives about service quality. Another study used SERVQUAL model to ascertain the service quality in Islamic and conventional banks of UAE (Jabnoun and Khalifa, 2005). Hossain and Leo (2009) have measured the service quality in retail banking in Qatar. A similar type of study was conducted by Hussein and Jabnoun (2006) on UAEs national and foreign banks.

In the Saudi Arabian context, some studies have been conducted utilizing SERVQUAL and SERVPERF models to measure service quality and customer satisfaction in the service industries. A study conducted by Jannadi and Al-Saqqaf (2000) on the Saudi Electrical Company (SEC) concluded that the company has a high score in tangible dimensions. However, it is not very effective in terms of responsiveness and reliability, even though the SEC service was acceptable to the majority of customers. In a survey conducted on the Saudi Arabian hotel industry, Soliman and Alzaid (2002) mentioned that assessment of service quality is a troublesome exercise because of service intangibility, specifically with reference to Saudi Arabia which has some unique aspects in terms of cultural and traditional environment. Al-Fawzan (2005) reported the findings of a survey that assessed service quality in Saudi banks. He explored the strengths and weaknesses of Saudi banks and also analyzed the gaps between service quality, customers' expectations, and their perceptions. Another study of the banking sector (Sohail and Shaikh, 2008) analyzed the quality of service in the internet banking industry in Saudi Arabia and found that there was considerable scope for further work regarding online banking use for improving customer services.

A literature search in the ABI/Inform and Emerald databases did not reveal any study utilizing the SERVQUAL instrument in the telecom sector in Saudi Arabia or the GCC region. This pioneering work of measuring the service quality of mobile phone operators in Saudi Arabia is expected to initiate further research work in this area.

3. Research Methodology

The objective of this study is to measure the perception of consumers toward the service quality of the three mobile service providers in Saudi Arabia. This study utilized the original 5 dimension of SERVQUAL which are: tangibility, reliability, responsiveness, assurance, empathy and added two dimensions of: network quality and competitive advantage which are germane to the mobile sector as suggested by Johnson and Sirikit (2002), Wang *et al.* (2004), and Pezeshki *et al.* (2009).

Wang et al. (2004) found that network quality is one of the most important factors associated with the quality of mobile communication service. Equally, Pezeshki *et al.* (2009) consider service quality and network performance as the major strengths and a source of customer satisfaction. Besides service quality, firms can achieve higher profitability and superior performance than others by providing customers with a certain competitive advantage (Johnson and Sirikit, 2002).

The studies seven dimensions are:

Tangibility - includes physical facilities, equipment, employees' dress, and communication material.

Reliability - refers to the ability to perform promised services accurately and sincerely.

Responsiveness - refers to willingness to help customers and to provide prompt services.

Assurance - refers to the knowledge and courtesy of the employee and their ability to inspire trust and confidence.

Empathy - its covers individualized attention of the

firm to its customers

Network Quality - refers to the strength of the network and call quality

Competitive Advantage - refers to the provision of better price, services, and promotions than its competitors

We have selected the SERVQUAL instrument as a means of measuring the service quality of the mobile communication sector in Saudi Arabia in this study because it is a well established model. This study is limited to the mobile telecommunication sector in Saudi Arabia. A five-point Likert scale was used for the scoring system from 1 to 5 where 1 indicates strongly disagreed and 5 represents strongly agreed. The questionnaire was based upon seven dimensions of service quality. The first five dimensions were adopted from the original SERVQUAL model, while the other two factors of "network quality" and "competitive advantage" were added to accommodate the sector specific requirements. The literature pertaining to telecom services revealed that network quality was used as a factor by Wang *et al.* (2004) in their study of the Chinese telecom industry. The competitive advantages factor was introduced by Johnson and Sirikit (2002) in their work on the Thai telecommunication industry. The questionnaire covers twenty six attributes in total. These items were coded as shown in Table 1 in order to generate a better understanding for empirical analysis.

To eliminate the problems of confusion and the length of the questionnaire, we only collected data concerning perceptions of the respondents. The element of expectation was discarded (Lai et al. 2007). The SPSS software was used to analyze the empirical data.

3.1. Data Collection

The research is based upon the data collected from undergraduate and graduate students at King Saud University in Riyadh. Business college students were selected because they were accessible and represented a large and growing market for mobile companies. In addition, they have a good understanding of service quality provided by mobile companies. Colwell *et al.* (2008) also selected the college students sample to measure service convenience in the context of personal cellular phone and internet usage. There were 7,146 registered students in both graduate and undergraduate studies at the College of Business Administration when the research was conducted. Out of these, 6,576 were undergraduates and 570 were graduate students. A schedule of all the undergraduate and graduate classes at the Business College was obtained. A random sample of 45 out of 717 classes of undergraduate students was generated. The same approach was applied to graduate classes from which 10 out of 74 classes were chosen randomly, noting that the number of students in each class is usually smaller in number than undergraduate classes.

The questionnaire was distributed in the selected classes and students were given several minutes to fill it in. It was collected right away. The same

Table 1. Study variables and code

Code	Tangibles
T1	The customer service branches of the company are located in convenient places
T2	The physical facilities are visually appealing
T3	The service provider has up-to-date equipment
T4	The employees are well dressed and neat in appearance
	Reliability
RL1	When the service provider promises to do something, it does so
RL2	The service provider shows a sincere interest in solving customer problems
RL3	The service provider provides services at the time it promises
RL4	The service charges are accurate
	Responsiveness
RS1	Help line is easily accessible
RS2	Employees give prompt service
RS3	Employees are always willing to help
RS4	The employees respond to customer requests even if busy
	Assurance
A1	The employees can be trusted
A2	Customers feel safe doing business with the service provider
A3	The service provider protects the confidentiality of customer information
A4	The employees are consistently courteous with customers
	Empathy
E1	The employees provide individual attention
E2	The employees know the customer needs
E3	The service provider has operating hours convenient to all
E4	The employee have the best interests of the customers at heart
	Network Quality
N1	The service provider has a strong and wide range network
N2	The call quality of the specific chosen network is always good
	Competitive Advantages
C1	The service provider has more competitive prices than its competitors
C2	The service provider has a wider range of products and services than its competitors
C3	The service provider has better service quality than its competitors
C4	The service provider offers better promotion than its competitors

procedure was applied on the female campus which is physically located at a separate location. (Co-education is not the norm in the Saudi Arabian culture). The original questionnaire was in English and was translated into Arabic for the sake of clarity and convenience. The translations were subjected to peer review.

The researchers distributed 800 questionnaires and 746 were collected. After verifying data and checking which questionnaires were left incomplete, 72 responses were deleted. The analysis was carried out on 674 responses with a response rate of 84.3 percent of the distributed questionnaires, or about 9.4 percent of the total student population.

4. Results And Analysis

4.1. Profile of the Respondents

Table 2 shows the respondents' personal characteristics. The data shows that 57.7 percent of respondents were male and 42.2 percent were female; 86.8 percent studying at the undergraduate level and 13 percent at the graduate level. The data also revealed that 83.3 percent of respondents were between 18 to 25 years of age. This is consistent with the authors' use of college students as their sampling frame (Qin and Prybutok 2008).

Almost 83 percent of respondents were using the services of the Saudi Telecom Company (STC) as opposed to the other service providers. STC was established in 1998 and is the oldest and the largest mobile phone company in Saudi Arabia while the other two mobile service operators, Mobily and Zain, are relatively new having been established in 2004 and 2007, respectively. In terms of length of duration in which the primary service provider's service was used, 47 percent of the respondents had used the services of a specific company from 6 to 10 years (only STC). Lastly, 77.7 percent of respondents were using primarily postpaid services (billed), while the rest were primarily using prepaid service.

4.2. Appropriateness for Analysis

To test the reliability of the SERVQUAL instrument, the authors computed Cronbach's alpha coefficients. The overall reliability for this study is 0.92, representing a high reliability factor equal to the first Parasuraman *et al.* (1988) study. As shown in Table 3, the Cronbach's alpha coefficients for each dimension ranges from 0.64 to 0.87. Only one dimension (Tangible) showed relatively less than the cutoff value of 0.70 as suggested in the literature (Nunnally and Bernstein 1994). All other dimensions showed high internal consistency and reliability while the new factor of Competitive Advantage showed high levels of reliability with Cronbach's coefficients of 0.87. The Network Quality dimension showed an average reliability with the alpha coefficient of 0.72.

Table 2. Demographic profile of respondents

Variable	Frequency	Percentage (%)
Gender		
Male	389	57.7
Female	285	42.3
Education		
Undergraduate	585	86.8
Graduate	89	13.2
Age (years)		
18 - 25	573	85.1
26 - 30	42	6.2
31 - 35	31	4.6
36 above	28	4.1
Primary Mobile Operator	564	83.7
STC	89	13.2
Mobily	21	3.1
Zain		
Duration of Service		
< 1 years	9	1.3
1 - 5 years	297	44.1
6 - 10 years	320	47.5
> 11 years	48	7.1
Billing		
Prepaid	149	22.1
Postpaid	525	77.9

Before conducting the factor analysis, Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy were computed as shown in Table 4. The test of sphericity (Bartlett, 1950) evaluates the probability that the correlation matrix originates from a population of variables that are independent. The level of significance in this study is 0.000, which means the data is appropriate for this test. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (MSA) was also computed. For the correlation matrix as a whole, the MSA is 0.931 which according to Kaiser and Rice (1974) can be labeled as "marvelous."

In summary, the scales used, as well as data gathered, appear to be appropriate for this research. Hence, the next section presents the results obtained from the factor analysis.

4.3. Factor Analysis

The confirmatory factor analysis results are presented in Table 5. Factors were analyzed using the Varimax rotation methodology with Kaiser Normalization and eigenvalue over 1.

As shown in Table 5, the 8 factor solution explains 67.66 percent of the total variance

Table 3. Reliability coefficients (Alphas)

Dimension	Number of Items	Alpha coefficients for dimension	Alpha coefficients if item deleted	Items
Tangibles	4	0.64	0.58 0.58 0.53 0.60	T1 T2 T3 T4
Reliability	4	0.75	0.66 0.65 0.65 0.79	RL1 RL2 RL3 RL4
Responsiveness	4	0.80	0.77 0.71 0.74 0.75	RS1 RS2 RS3 RS4
Assurance	4	0.76	0.66 0.69 0.72 0.75	A1 A2 A3 A4
Empathy	4	0.64	0.67 0.68 0.76 0.66	E1 E2 E3 E4
Network Quality	2	0.72		N1 N2
Competitive Advantages	4	0.87	0.84 0.82 0.84 0.84	C1 C2 C3 C4
Total scale reliability		**0.92**		

representing a significant value. The results indicate that most of the items were properly loaded to their corresponding dimensions with slight overlapping. The findings of the study indicate that two dimensions from the original model of Parasuraman *et al.* (1988), namely reliability and responsiveness, were loaded into separate factors which explain a clear differentiation in customers' minds regarding these dimensions. While the two added dimensions of network quality and competitive advantages were also loaded in separate factors, indicating a clear differentiation, most of the variables were loaded with the value of above 0.60 representing a high level of significance.

The empathy (E) dimension showed that overlapping with assurance (A) and tangibility (T) may be indicating that the customers have no clear differentiation for empathy dimension. The T4 and A4 items had factor loadings of greater than 0.60 to empathy dimension, which demonstrates that customers consider dress and courtesy of employees to be closely related to empathic behavior. To some extent, this problem was also mentioned by Zhao *et al.* (2002) in their study on the retailing industry of China.

The E3 item is loaded into a different factor in isolation suggesting that customers consider convenience of operating hours to be a separate factor. This also shows that Saudi customers attach much importance to the working hours of the mobile service provider.

Table 4. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.931
Bartlett's Test of Sphericity	Approx. Chi-Square	6615.342
	Df	325
	Sig.	0.000

4.4. MANOVA

The purpose of analysis of variance is to test the significant differences between means of service dimensions and some demographic variables. For this purpose we selected the multivariate analysis of variance test (MANOVA) to see if there were any significant differences between independent and dependent variables. This analysis also helps us see the overall effect of independent variables on all the dependent variables, while ANOVA can be used to ascertain the significance between dependent and independent variables individually. The Hotelling's T^2 showed a significant result ($P<0.0001$) which indicates that there is a significant difference of means between the independent variables (gender, education, and mobile operator) and all of the dependent variables.

Table 5. Factor Analysis*

Item	Tangible	Reliability	Responsiveness	Assurance	Empathy	Network Quality	Competitive Advantages	Time Convenient
T1	**,640**							
T2	**,754**							
T3	**,634**							
T4	,418				**,606**			
RL1		**,586**						
RL2		**,495**	,477		,401			
RL3		**,675**						
RL4		**,683**						
RS1			**,631**					
RS2			**,670**					
RS3			**,708**					
RS4			**,721**					
A1			,406	**,622**				
A2				**,611**				
A3				**,796**				
A4					**,667**			
E1					**,514**			
E2					**,411**			
E3								**,831**
E4					**,479**			
N1						**,852**		
N2						**,775**		
C1							**,781**	
C2							**,837**	
C3							**,730**	
C4							**,824**	
Variance extracted %	3.82	4.44	35.35	4.12	5.06	3.46	8.26	3.15

* Factor Analysis: Extraction Method is Principal Component Analysis; Rotation Method is Varimax with Kaiser Normalization; Factor loadings below 0.4 are not shown; Primary loading is shown in bold.

Table 6. MANOVA Test of Gender

Source	Dependent Variable	Mean		F	Sig.
		Male	Female		
Gender	Tangible	3.566	3.696	6.560	0.011
	Reliability	2.978	3.292	20.839	0.000
	Responsiveness	2.683	2.835	4.622	0.032
	Assurance	3.211	3.530	25.751	0.000
	Empathy	3.049	3.338	21.070	0.000
	Network	3.541	3.581	0.271	0.603
	Competitive Advantages	2.900	3.046	3.164	0.076
	Time convenience	3.450	3.681	8.363	0.004
Hotelling's T^2 Value = 0.060 F = 5.002 Error df = 665.000 Sig. = 0.000					

Table 7. MANOVA Test of Education

Source	Dependent Variable	Mean		F	Sig.
		Undergrad	Graduate		
Education	Tangible	3.621	3.618	0.002	0.964
	Reliability	3.147	2.875	7.225	0.007
	Responsiveness	2.776	2.559	4.442	0.35
	Assurance	3.387	3.075	11.405	0.001
	Empathy	3.231	2.775	24.743	0.000
	Network	3.559	3.551	0.006	0.940
	Competitive Advantages	2.969	2.914	0.213	0.645
	Time convenience	3.554	3.506	0.169	0.681
Hotelling's T^2 Value = 0.057 F = 4.778 Error df = 665.000 Sig. = 0.000					

As shown in Table 6, there is a significant difference between males and females regarding the perception of tangibility, reliability, responsiveness, assurance, empathy, and time convenience. Only one factor of network quality showed insignificant results, demonstrating that there is not much difference between male and female customers regarding this factor. The differences of opinion in the above mentioned factors can be due to the fact that in the Saudi culture the male respondents may have more exposure to outer environment and can easily observe factors like tangibility, responsiveness, or assurance, etc. However, female customers can observe network quality the same way as male customers, and thus results are compatible with the local environment and cultural norms of the country.

Table 7 shows the relationship between education and each of the 8 factors. Significant results can be found in reliability, assurance, and empathy, while other factors explain insignificant results. Undergraduate students perceived better service quality than graduate students regarding reliability, assurance, and empathy. This shows that more qualified customers tend to analyze the above mentioned dimensions more critically and perceive some deficiencies in these areas.

Significant results can be found in all dimensions except network quality regarding mobile operators as shown in Table 8. Customers perceived major differences in service quality in the three mobile companies. Most of the respondent revealed their liking for the tangibility of Mobily, while Zain's service was considered most reliable. People thought that the Mobily staff was more responsive, while results of the STC exhibited the least responsiveness

Table 8. MANOVA Test of Mobile Operator

Source	Dependent Variable	Mean			F	Sig.
		STC	Mobily	Zain		
Mobile Operator	Tangible	3.533	4.124	3.825	35.432	0.000
	Reliability	2.991	3.698	3.788	32.830	0.000
	Responsiveness	2.591	3.529	3.683	61.263	0.000
	Assurance	3.244	3.890	3.783	28.968	0.000
	Empathy	3.081	3.663	3.533	22.776	0.000
	Network	3.587	3.455	3.175	2.297	0.101
	Competitive Advantages	2.805	3.754	3.883	44.118	0.000
	Time Convenience	3.506	3.820	3.650	3.713	0.025
Hotelling's T^2 Value = 0.394 F = 16.261 Error df = 1322.000 Sig. = 0.000						

towards their customers. While the majority of mobile users use the STC, they are not necessarily happy with its service.

5. Conclusion and Managerial Implications

In this study, we adapted the SERVQUAL instrument to Saudi Arabia's mobile communications industry. Based on the findings of this study, we found that SERVQUAL can be a helpful tool in measuring the quality of the Saudi mobile communications industry. The total reliability scale of the study is 0.92, showing the same results as Parasuraman *et al.* (1984). In addition to the original five dimensions of service quality, the additional dimensions of "network quality" and "competitive advantage" were used to enhance overall service quality perception.

Based on the factor analysis, researchers discovered that Saudi customers place much importance on the convenience of working hours, while there is no clear differentiation in the minds of customers regarding the empathy dimension. Most of the variables loaded above 0.60 represented a high level of significance.

The mean of the seven dimensions revealed that STC, the largest mobile service operator in Saudi Arabia, has a disadvantage in all but network quality. Understandably, STC has invested over the years in its network coverage. This may indicate that, while customers do not particularly like STC, they are content with its good network quality compared to the other two new entrants. The customer's bond to the old company may be because of customer loyalty, high switching cost, or simply because they prefer the main factors of network quality and coverage which STC excels in. However, the company may not maintain its current status if it does not focus on issues like service reliability and responsiveness towards its customers. The study suggests that STC must take drastic measures to improve its reliability and responsiveness in order to, in the long run, remain the market leader in Saudi Arabia.

Mobily, the second largest operator in the industry is posing a severe threat to STC as its market share is increasing day by day. This study shows that Mobily scored higher on better service quality provisions in tangibles, customer assurance, and empathy dimensions. The time convenience factor which was given much preference by Saudi customers is also providing the competitive edge to the company. Our findings are in accordance with the actual situation which shows a rapid growth in Mobily mobile phone subscriptions and customers' growing trust in the services provided by the company.

The third Mobile phone operator, Zain, a relatively new company, is gaining the confidence of customers. The study indicates that the company provides better service quality than its competitors in more than one dimension. The company is competitive, and the customers consider it more reliable and responsive to addressing their needs. However, the company has a low mean in network quality and coverage, as it is still is in its emerging phase. We suggest that the company must focus on building a better infrastructure in order to provide better network and coverage.

On the basis of the study, we conclude that there is a clear differentiation in customers' preferences in almost all the dimensions which indicates a good level of understanding and awareness about the subject. We suggest that mobile phone companies working in Saudi Arabia focus more on the provision of better quality services; in particular, STC must take concrete steps to update and enhance its overall service quality structure. The company can do so by conducting intensive training programs for the already available staff and hiring better human resources to address issues like lack of responsiveness and reliability. The overall competitive advantage of the company is also low, and it requires much effort to retain and increase its market share. Mobily is doing an excellent job and customers are generally satisfied with its overall performance. While Zain shows a great potential for long term growth, it should continue its focus on better services and should increase its investment in tangibles and network quality in the coming days.

6. Limitations and Directions for Future Research

Although our study is the first to adapt and utilize the SERVQUAL instrument in Saudi Arabia's mobile communications industry, this study has several limitations. First, the findings are from the cellular communications industry which may not be applicable to other industry settings such as hypermarkets, financial institutions, and restaurants. Second, the subjects of the study were students in the oldest and largest business school in Saudi Arabia and their perceptions may not coincide with those of the general population. Last, data were collected from self-reported questionnaires that may incorporate personal biases.

Several topics for future research are suggested by this study. First, research can be conducted to assess whether the SERVQUAL instrument is valid for other Saudi industries. Second, an investigation of

female and male consumers in Saudi Arabia to uncover underlying reasons for the differences in their assessment of service quality is appropriate. The findings of this study indicated the presence of statistically significant differences on six out of seven factors. This is important as Saudi society is a conservative one, albeit becoming more liberalized. Last, more research is needed utilizing SERVQUAL or other service quality models, as research on Saudi Arabian service quality is limited and has largely been unexplored.

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قياس جودة خدمات شركات الهاتف الجوال في المملكة العربية السعودية

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الكلمات المفتاحية: الهاتف الجوال، جودة الخدمات، التحليل العاملي، المملكة العربية السعودية، أداة سيرفكوال.

ملخص البحث. الغرض من هذه الدراسة هو قياس جودة خدمات شركات الهاتف الجوال العاملة في المملكة العربية السعودية باستخدام أداة (سيرفكوال). وتم جمع البيانات من طلاب كلية إدارة الأعمال في إحدى الجامعات الرائدة في المملكة العربية السعودية باستخدام إستبانة أعدت لهذا الغرض. وتم إجراء التحليل العاملي التوكيدي وإختبار التباين المتعدد على بيانات الدراسة.

تم تكييف أداة سيرفكوال المفيدة في قياس جودة الخدمات. وبينت النتائج إختلافا كبيرا في إدراك العملاء لجودة الخدمة بصفة عامة بين مختلف الشركات. كما أظهر البعدان المضافان إلى أداة سيرفكوال الأصلية وهما جودة الشبكة والميزة التنافسية نتائج هامة. كان هناك اختلاف ذو دلالة إحصائية بحسب الجنس، وبحسب التعليم، وبحسب مقدمي الخدمة بشأن أبعاد الجودة.

يقدم هذا البحث مساهمة قيمة إلى أدبيات جودة الخدمات في المملكة العربية السعودية مع التركيز بوجه خاص على شركات الهاتف الجوال. وهذه دراسة رائدة وتقيس جودة الخدمات في هذا المجال في المملكة العربية السعودية. كما أنه يكشف عن تمايز واضح في تفضيلات العملاء في جميع الأبعاد تقريبا.