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The effect of mobile service quality dimensions on customer satisfaction

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Abstract

Information technology (IT) has an increasing importance and development in business life. Importance of IT arises because the businesses have tendencies to reach their customers through mobile services lately (Shin and Kim, 2008). These developments require the companies to have developed systems in order to reach their goals. Developments in wireless communication technology with the support of internet increased the level of mobile commerce as an important tool for the companies. This study determines the dimensions of mobile service quality and their effect on customer satisfaction. In this study, we determine the dimensions of mobile service quality and their effect on satisfaction and intention to use. We also examine how compatibility of mobile devices, such as mobile phones, directly and indirectly influences satisfaction.

Keywords: Service quality, Mobile services, Mobile service quality,

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1. Introduction

Information technology (IT) has an increasing importance and development in business life. Importance of IT arises because the businesses have tendencies to reach their customers through electronic services lately (Shin and Kim, 2008). These developments require the companies to have developed systems in order to reach the goals. Developments in wireless communication technology with the support of internet increased the level of mobile commerce as an important tool for the companies. In addition, declining the prices of the mobile devices and improvements of functionality of the devices give chances to the companies to perform in mobile commerce (Lu et al., 2009).

Companies can use mobile devices for different purposes. One of the purposes is certainly communication. While consumer can use mobile devices to communicate personally, by using mobile services, companies can easily reach to their customers and promote themselves. However, mobile devices should not be considered only as tool for

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communication. Mobile devices are also critical for commerce (Lu et al., 2009). Companies can use mobile devices in order to run all business operations. This is a shift for the companies from traditional transactions to mobile commerce. Wu and Wang (2005) cite that only 16% of internet users were using global wireless internet while this rate was 57% in much more users. Developing the mobile service providers also support the developments in mobile commerce (Lu et al., 2009). These developments carry us to the idea that companies providing mobile commerce need to do some works to gain competitive advantage. In order to have the competitive advantage, mobile service quality is one of the very important factors that companies have to face. While the competition in mobile services is increasing, only providing the mobile services will not be enough to obtain necessary competitive advantage. Increasing the quality of the mobile services will also be important for having the competitive advantage. Thus, that is a reason for this research for measuring the service quality for mobile services while it is important for the companies (Turel and Serenko, 2006).

Mobile service providers look for the answer of how to obtain competitive advantage. Thus, providing the mobile services are not the only reason why they operate, they also have to increase the service quality. This is the reason why measuring service quality is important (Lu et al., 2009). In addition, the mobile device is also important especially for the use of the customers. In other words, customers' considerations on the mobile device, such as mobile phones, will be important in perceiving the quality of mobile services. This study determines the factors for mobile service quality while considering mobile phones as mobile devices. The study also searches for the relationship among these dimensions and customer satisfaction.

2. Literature Review And Hypotheses

2.1. E- Service Quality and E- Service Quality Measurement

Service quality is considered as consumer's judgment about an entity's overall excellence or superiority (Zeithaml, 1987). The judgment in the definition is more difficult compare to physical product because services are intangible (Parasuraman et al., 1985). Heterogeneity and inseparability are the other characteristics to make the judgments more difficult.

It is easy to see many studies regarding service quality in the literature. One of the important reasons for focusing on the service quality in the literature is the importance of service quality on companies' success (Martínez Caro and Martínez García, 2007; Negi, 2009; Santouridis and Trivellas, 2010; Santos, 2003). Service quality is different than physical product quality because of the characteristics of the services, making the approach to measure quality differently in services Service quality theory is directly related to product quality and customer satisfaction literature (Brady and Cronin, 2001) but adapted according to the characteristics of the services (intangibility, heterogeneity and inseparability) (Parasuraman et al., 2005).

There are different approaches to measure service quality in marketing literature. Most commonly known is SERVQUAL and SERVPERF. SERVQUAL scale was developed by Parasuraman et al. (1988). According to the scale, there are five dimensions in order to measure service quality. These are tangibles, reliability, responsiveness, assurance, and empathy. At last we can consider that the quality will be determined as the difference between what the customer expected and what they experienced (Parasuraman et al., 1985; Brady and Cronin, 2001). Even though SERVQUAL is the most commonly used scale for measuring service quality, there are some critics for SERVQUAL. As a result of this criticism, Cronin and Taylor (1992) worked on service quality by using performance that their scale was called SERVPERF. Cronin and Taylor (1994) suggest that difference between performance and expectations is not an appropriate way to measure service quality. In addition to this difference, Cronin and Taylor (1992) also suggest that customer satisfaction has effect on purchase intention more than service quality has.

Even though scales in e-service quality were adapted mainly from the service quality literature in general, there are some studies to determine the dimensions of e-service quality and develop scales in order to measure. Yang and Jun (2002) determined reliability, access, ease of use, personalization, security and credibility as the dimensions. Most of these factors were derived from earlier studies which were traditional service quality dimensions (Parasuraman et al., 1985). Bauer et al. (2006) used both utilitarian and hedonic elements for measuring e- service quality (eTransQual) and found functionality/design, enjoyment, process, reliability and responsiveness as the dimensions. Parasuraman et al. (2005) tested a multiple item scale (E-S-QUAL) for measuring the service quality. According to Parasuraman et al. (2005), two different scales are necessary in order to measure e-service quality. Their first scale, E-S-QUAL, has four dimensions (efficiency, fulfillment, system availability, and privacy), and the second scale, E-RecS-QUAL, has three dimensions (responsiveness, compensation, and contact). Barnes and Vidgen (2001) developed WebQual scale based

on SERVQUAL and reach five dimensions (tangibles, reliability, responsiveness, assurance and empathy. Wolfinbarger and Gilly (2003) developed a scale, EtailQ, in order to measure the service quality in e-retailing and reached four quality dimensions (fulfillment/reliability, website design, customer service and security/privacy).

2.2. Mobile Services

Mobile commerce is defined as mobile character of wireless devices that support electronic service transactions (Kleijnen et al.., 2007). In most of the cases, m-commerce is considered under e-commerce. However, mobile commerce has its own characteristics and delivers different values to the customers (Balasubramanian et al., 2002). Compare to other goods and services, mobile services may be considered as homogenous because of the standards and regulations (Lim et al., 2006).

Mobile services are considered as a new marketing application while the use of mobile technology increased in recent years. Developments in mobile services continue to grow. The main reasons for this development are excitement for mobile technology, continuing growth of e-commerce, and high penetration level of wireless devices (Kleijnen et al., 2004; Wang and Lin, 2012).

The study of adoption of mobile services is also new for marketing. For this reason, researchers use earlier scales to adapt to mobile services. Kleijnen et al. (2004), for example, used Adoption of Innovation Framework in order to determine the characteristics of mobile services. In their study, they determined four factors adapted from Adoption of Innovation Framework, namely relative advantage, compatibility, complexity and communicability for mobile services (Kleijnen et al. 2004). Relative advantage is related to consumers' joy of mobile services that they can find everywhere, anytime. Compatibility refers to how consumers think about the mobile service to be the routine of their life. We consider customers' routine life and try to find out if consumers perceive innovations as consistent with their needs, values, and past experiences (Wu and Wang, 2005; Mallat et al., 2006; Kleijnen et al., 2007). Complexity means the usage of mobile services other than delivering the services. Communicability refers to social influence. In order to these four factors, Kleijnen et al. (2004) defined four more factors affecting the adoption of mobile services. These factors are; perceived risk, navigation, critical mass, and payment options. The risk the consumers take will be effective on the decisions for mobile services (Van der Hejden, 2005). The risk is mainly about functional risk that is about performance. Navigation is another important factor for mobile services because it gives the users' chance for timely action. Another factor is critical mass which is defined as the minimal number of adopters of an interactive innovation for the further growth of adoption to be self sustaining (Mahler and Rogers, 1999). The final factor is payment options that should be considered. Different payment options and differentiated pricing may influence the consumers to use mobile services. Nysveen et al (2005) state that motivational influences, attitudinal influences, social influences, and resource-related influences form intentions to use mobile services. In addition, perceived usefulness, perceived ease of use, and perceived enjoyment have influence on the attitudes towards mobile services.

2.3. Mobile Service Quality

As it is important in every industry, quality perceptions also have great importance in mobile services. Surveys on US consumers' perception show that consumers of mobile services are not satisfied compare to other services and 35 percent of the US mobile subscribers in 2004 were thinking to switch to another mobile service provider (Lim et al., 2006). These findings show that mobile service providers have to find ways to increase the service quality and customer satisfaction.

As mentioned before related to electronic service quality, researchers mostly use existing service quality scales for measuring mobile service quality (Negi, 2009). This is the reason for not having a proper scale to measure mobile service quality directly for a long time. It could have been considered as a lack because mobile services has their own characteristics such as mobility, anytime and anywhere computing, and social conditions (Lu et al., 2009).

One of the studies to develop m-service quality scale is the study of Lu et al. (2009) that they adopted dimensions for mobile service quality from Brady and Cronin (2001). In the study, Lu et al. (2009) adopted multidimensional and hierarchical method to measure m-service quality using mobile brokerage service as an example. They considered the unique characteristics of mobile services while they also consider that there is no single method to measure perfectly in every industry. According to their study (Lu et al., 2009), there are three primary dimensions, namely interaction quality, environment quality, and outcome quality. These dimensions include sub-dimensions; attitude, expertise, problem solving and information for interaction quality, equipment, design, and situation for environment quality, and punctuality, tangibles and valence for outcome quality. Shin and Kim (2008) state different dimensions to measure

mobile service quality. These dimensions are called quality, pricing structure, mobile devices, value- added services, convenience in procedures, and customer support.

Shin (2010) stresses the importance of service quality particularly in mobile services because when consumers experience delays in response, disconnections, lack of access and poor security, they can be reluctant to use mobile services. Lim et al., (2006) identifies the attributes for mobile services quality that the consumers will evaluate the service provider. These attributes are pricing plans, network quality, data services, messaging services, entertainment services, locator services, billing system, and customer service.

Grönroos's separation for service quality is also important for mobile services. As mentioned before, for most of the services, it is difficult to evaluate technical quality. Because of the difficulties and while mobile services are considered homogenous because of the regulations and standards, functional quality (billing system and customer services) becomes more important for mobile services. However, technical quality can also be influential that some consumers clearly feel the difference among companies while knowing that technical quality is about pricing plans, network quality and mobile data services (Lim et al., 2006).

Tan et al. (2008) consider seven dimensions for mobile service quality: perceived usefulness, perceived ease of use, content, variety, feedback, experimentation, and personalization. Perceived usefulness is related to performance of the person whether using a particular system increases the performance. Perceived ease of use is related to easily using the mobile system. Content is related to what is in the service and content quality is important for mobile services quality. While different features of multimedia is available, consumers perceive the service positively thus variety is critical. While consumers reach the information they expect, that means feedback is provided. As long as the consumers have detailed information about the operations they have, their perception for mobile service quality will be higher. Experimentation and personalization are also important for consumers to evaluate the mobile service quality. Experimentation is associated with exploratory behavior. Mobile devices are personalized, so while personalization occurs, consumers will have positive attitudes (Tan et al., 2008).

Consumers' intention to use mobile services is related to mobile services quality. The reason people use mobile services and type of mobile services will influence the evaluations. Nysveen et al. (2005) use interactivity and process characteristics. Interactivity might be person or machine interactivity according to the mobile services. Nysveen et al. (2005) considers text messaging and contact as person interactive while payment and gaming are machine interactive. Process characteristics include two dimensions; goal directed and experiential. A goal directed process is explained by extrinsic motivation, instrumental orientation, utilitarian benefits and directed search/choice while experimental process is explained by intrinsic motivation, ritualistic orientation, hedonic benefits, and nondirected search and navigational choice.

Another issue for understanding service quality is service value which is also important in mobile services (Kleijnen et al., 2007). Cronin et al. (2000) argues that service value has a mediator effect on service quality. The type of the value will also be effective on the evaluations of service quality. Nysveen et al. (2005) states that in contrast to mobile communication, mobile transactions are related to utilitarian values. While we have the knowledge that utilitarian and hedonic benefits differ in evaluating the satisfaction and service quality (Jiang and Wang, 2006), we can assume that evaluations for mobile services will also be different between both value contexts. While mobile services are related to transactions, these services can be considered goal oriented and being goal oriented is related to utilitarian benefits. Pleasure is a determinant for consumers' evaluations and related to service quality. Jiang and Wang (2006) state that there is a relationship between pleasure and service quality and this relationship is stronger in hedonic service context than utilitarian. They also found that their findings were mainly focused on utilitarian services when it is regarded to service quality literature, mainly focusing on the functional utilities. This bring us the idea that while mobile services are considered as functional, utilitarian benefit evaluations of the customers will be different and stronger than hedonic benefit evaluations (Jiang and Wang, 2006).

2.4. Mobile Service Quality and Satisfaction

When customers evaluate mobile service providers, they focus on the satisfaction they will have from the service. Thus, service quality will influence customers' evaluations (Zhao et al., 2012). Examining the dimensions of service quality becomes more critical due to importance of understanding service quality as a whole and its effect on satisfaction. The importance of satisfaction comes from the effect on the customers' continuing positive intentions (Cronin et al., 2000). Satisfaction will make the customers buy again and more frequently (Kuo et al., 2009). As Turel and Serenko (2006) argue, customers with high level of satisfaction have a tendency to repurchase and more tolerance to price changes.

Earlier studies found direct relationship between service quality and satisfaction (Cronin and Taylor, 1992; Cronin and Taylor, 1994; Cronin et al., 2000; Keaveney and Parthasarathy, 2001; Lim et al., 2006; Shin and Kim, 2008; Parasuraman, et al, 1988). Cronin et al. (2000) state that favorable service quality perceptions improve satisfaction. Satisfaction literature also relates switching intentions and service quality. Studies show that service quality has direct effect on behavioral intentions through satisfaction (Cronin et al., 2000). According to the studies (Shin and Kim, 2008), while perceived service quality is high, satisfaction will also be high, and then switching tendency of the customers will be low. In addition to direct relationship, Cronin et al. (2000) also proposed indirect relationship between service quality and behavioral intentions. They argue that service quality has significant effect on behavioral intentions through satisfaction.

Zhao et al. (2012) explored the effect of service quality and justice on customer satisfaction in mobile services. They used multiple dimensions to measure. The dimensions they used for service quality was interaction quality, environment quality and outcome quality as in the study of Lu et al. (2009). Results show that three dimensions have significant and positive effect on satisfaction. Turel and Serenko (2006) also stated that there is a positive relationship between perceived quality and person's satisfaction, and satisfaction leads to loyalty. Lin and Wang (2006) also worked on the relationship between service quality, customer satisfaction and loyalty in mobile commerce. In their model, perceived value and trust have positive influence on customer satisfaction, and then influence customer loyalty. While perceived value and trust have significant effect on service quality, the effect on satisfaction will also be indirectly effective. Kuo et al. (2009) found that service quality has positive effect on both perceived value and customer satisfaction, while perceived value has a positive effect on customer satisfaction in mobile services. Kuo et al (2009) categorize four factors for service quality: content quality, navigation and visual design, management and customer services, and system reliability. Among these factors, factor that related to customer service and system reliability have more influence on perceived value and customer satisfaction.

Existing literature states that the dimensions of mobile service quality have interaction among each other. Bauer et al. (2006) point out that functionality and design is important in customers' evaluation of service quality. They focus on the technical quality aspects and mention that interface design for web sites will be important for, such as, ease of use. At the same time, Bauer et al. (2006) points out that enjoyment is another important aspect for customers to evaluate the services that bring us to entertainment. Grönroos et al. (2000) also stresses the importance of user interface in evaluating service quality. Risk is another important issue effecting the decision of the customers. Customers are vulnerable to risk in mobile transactions (Kleijnen et al., 2007). The relationship between the mobile device and risk is perceptual. Lee et al., (2003) argue that perceived attributes of the innovation can be a determining factor for adopting decisions. Their conclusion in their study is that attributes and risk perceptions are directly related in mobile services (Lee et.al, 2003) while availability is another important factor for customers to consider satisfaction through mobile service quality (Rahman et. Al., 2010). Studies show that ease of use is directly and positively related to acceptance of mobile services (Nysveen, et al., 2005), and ease of use is related to attributes of the product (Tan and Chou, 2008).

3. Methodology

3.1. Research Goal

In this study, we aim to determine the dimensions of mobile service quality and analyze whether they have positive influence on customer satisfaction specifically in mobile services. A structured questionnaire was used in order to gather the data to develop the mobile service quality scale.

3.2. Sample and Data Collection

In the current study, the hypothesized relationships were tested using data collected from Turkish university students. Therefore, the sample of the study was university student and data fort this study were collected through a self-administrated questionnaire of Anadolu University and Eskisehir Osmangazi University students in the province of Eskisehir, Turkey during the period October 2 through December 31, 2012. Studies have shown that mobile services and internet are common among young people (Kinnally et al., 2008). As indicated by Plouffe (2008), university students represented an ideal population from which to form a sampling for this study for two reasons. First, from both demographic and experiential perspectives, there is no other segment of the population that is as active in terms of mobile service using behavior. Second, studying university students in Turkey is logical because they assume

early adopters and innovators of mobile services. Twenty surveyors were used for data collection by a self-administration and research-aided technique. Questionnaires were answered at institutions, faculties and canteens of two universities. The researchers first briefly explained the research purpose, and then gave the questionnaires to willing participants. The time to explain the study and complete the questionnaire was approximately 15 minutes. A total of 1200 questionnaires (600 for each university) were distributed, 1000 of which were completely answered (579 for the first university and 421 for the second university), resulting in a total return rate of 83.3 percent.

3.3. Analyses and Results

Characteristics of the respondents are shown in Table 1. 50,3 percent of the respondents were male. 45,3 percent were at the age of 21-22, 28,4 percent were aged between 19-20, and 18 percent were aged between 23-24. Respondents are mostly at the second, third or fourth grade of their study. Most of the respondents are spending between 401- 600 TL monthly and they are mostly spending equal to or less than 25 TL for mobile phones. Majority of the respondents spend less than 30 minutes on phone in a day and they are using mobile phones for social media and chat.

Table 1: Characteristic of the respondents

Variable	N	%	Variable	N	%
Gender			*Average Spending (*$)		
Male	503	50,3	278 or lower	248	24,8
Female	497	49,7	279-417	366	36,6
			418- 555	266	26,6
Age			556-695	88	8,8
18 or lower	30	3,0	696 or higher	31	3,1
19-20	284	28,4			
21-22	453	45,3	*Average spending for mobile (*$)		
23-24	180	18,0	14 or lower	461	46,1
25 or higher	47	4,7	15-28	394	39,4
			29-41	107	10,7
Grade at school			42 or higher	37	3,7
Preparatory	58	5,8			
1st grade	99	9,9	*Average time spending on phone*		
2nd grade	234	23,4	15.min. or lower	289	28,9
3rd grade	249	24,9	16-30min	301	30,1
4th grade	316	31,6	31-45min	177	17,7
Other	40	4,0	46-50min	127	12,7
			46-60min	106	10,6
Academic Unit					
Vocational High School	74	7,4	*Mobile services used with mobile phone*		
College	63	6,3	Music download	98	9,8
University	825	82,5	video download	22	2,2
Institution	13	1,3	chat programs	187	18,7
Other	21	2,1	Watching TV	17	1,7
			Navigation	24	2,4
			Social media	533	53,3
			Other	87	8,7

A pool of measures were gathered from existing literature for mobile service quality and customer satisfaction (Zhao et al., 2012; Lim et al., 2006; Tan and Chou, 2008; Kleijnen et al., 2007; Bauer et al., 2006) and adapted according to the specific goal of the study. We mainly adapted the items of mobile service quality scales because there is a lack of scales in the literature particularly for mobile devices and services. We used five point Likert scales ranged from strongly disagree (1) to strongly agree (5).

For the scale development for mobile service quality, we establish a pool of items generated from the literature. Then, we conducted exploratory factor analysis in order to determine the dimensions of mobile service quality. We reached six factors in factor analysis for mobile service quality, however, reliability was real low for one factor (alpha:

0,256), so we eliminated the items "mobile service has some connection errors" and "information mobile service provides is sufficient". As a result we had 24 items left for repeating the factor analysis. Principal component analysis and varimax rotation were used for exploratory factor analysis. All the factor loadings were above the recommended cut off point of 0,40 (Nunnally and Bernstein, 1994). Internal reliabilities of the factors were also higher than the recommended level of 0,70 (Bagozzi and Yi, 1988). As a result of the factor analysis, we reached to five dimensions for mobile service quality; availability, perceived risk, easy to use, compatibility of mobile devices and entertainment services.

Table 2: Principle Component Analysis

	Variable	1	2	3	4	5	6
	Satisfaction						
SAT 1	SAT1 I am satisfied with mobile services	,812					
SAT 2	SAT2 Using mobile services satisfied me	,843					
SAT 3	SAT3 I enjoyed using mobile services	,829					
SAT 4	SAT4 I can easily recommend mobile services to my friends and family	,760					
SAT 5	SAT 5 I will most probably use mobile music service	,519					
	Availability						
AVA 1	S15 Download speed of mobile services is very good		,637				
AVA 2	S16 Mobile service quickly responds to my data access		,735				
AVA 3	S17 I can reach mobile service anytime		,759				
AVA 4	S18 I can reach mobile services anywhere		,740				
AVA 5	S19 mobile services automatically remembers my preferences		,436				
AVA 6	S20 Mobile service company is willing and ready to respond to customers		,526				
AVA 7	S21 Mobile service company shows good interest when customers have any problem		,507				
	Percieved Risk						
RISK 1	S11 I am confident that my private information will be respected			,743			
RISK 2	S12 I am confidence that transactions I make with mobile services are secure			,799			
RISK 3	S13 I am confidence with the security of mobile service			,815			
	Easy to use						
EASY 1	S1 Menu of the service is clearly classified				,812		
EASY 2	S2 I can easily find the information I need in mobile service				,813		
EASY 3	S3 Content of the mobile service is well designed				,751		
	Compatibility of Mobile Devices						
COMP 1	S8 Appearance and use of the device is good					,723	
COMP 2	S9 Size of the screen of the device is big enough					,827	
COMP 3	S10 Resolution of the screen is high quality					,792	
	Entertainment Services (Lim et al, 2006)						
ENT 1	S5 Mobile service provides wide variety of music						,787
ENT 2	S6 Mobile service provides high quality sound with the music						,753
ENT 3	S7 Mobile service provides high quality videos						,626
	Eigenvalues	8,91	1,95	1,58	1.34	1.24	1,14
	% Variance Explained	14,663	14,035	10,302	10,007	9,817	8,503
	Cronbach's Alpha	0,89	0,83	0,80	0,85	0,81	0,75
	KMO	0,917					
	Bartlett Test	χ^2= 11942, 714 (p=0,000)					

Content validity could be considered as subjective. The literature was analyzed for both conceptual and empirical studies and items for the scale were developed according to literature review. Dimensions and items were also checked by experts in the area. Confirmatory factor analysis was performed to establish measurement model. With the establishment of the measurement model, we can test convergent and discriminant validity. Confirmatory factor analysis also tests the unidimensionality (Steenkamp and Trijp, 1991). CFA was performed to each construct separately to assess unidimensionality. All the models fit the data and composite reliabilities were also higher than the recommended level of 0.70. CFA modification indices showed us that the model will be better if two items, "mobile service company is willing and ready to respond to customers" and "mobile service company shows good interest when customers have any problem", were eliminated from the model. Final results for confirmatory factor analysis are shown in Table 3.

Table 3: Results of the Measurement Model

	Variable	Factor Loadings	t-value	R^2
	Satisfaction (CR:0,91, AVE: 0,67)			
SAT 1	SAT1 I am satisfied with mobile services	0,89	35.28	0,78
SAT 2	SAT2 Using mobile services satisfied me	0,93	38.30	0,86
SAT 3	SAT3 I enjoyed using mobile services	0,87	34.41	0,76
SAT 4	SAT4 I can easily recommend mobile services to my friends and family	0,81	30.36	0,65
SAT 5	SAT 5 I will most probably use mobile music service	0,54	17.88	0,29
	Availability (CR:0,81, AVE: 0,47)			
AVA 1	S15 Download speed of mobile services is very good	0,61	19.70	0,37
AVA 2	S16 Mobile service quickly responds to my data access	0,71	24.07	0,50
AVA 3	S17 I can reach mobile service anytime	0,79	28.01	0,63
AVA 4	S18 I can reach mobile services anywhere	0,75	26.05	0,56
AVA 5	S19 mobile services automatically remembers my preferences	0,52	16.51	0,27
	Percieved Risk (CR:0,82, AVE: 0,60)			
RISK 1	S11 I am confident that my private information will be respected	0,63	20.53	0,39
RISK 2	S12 I am confidence that transactions I make with mobile services are secure	0,81	27.83	0,65
RISK 3	S13 I am confidence with the security of mobile service	0,87	30.76	0,76
	Easy to use (CR:0,86, AVE: 0,67)			
EASY 1	S1 Menu of the service is clearly classified	0,85	31.08	0,71
EASY 2	S2 I can easily find the information I need in mobile service	0,83	30.40	0,69
EASY 3	S3 Content of the mobile service is well designed	0,77	27.46	0,60
	Compatibility of Mobile Device (CR:0,82, AVE: 0,60)			
COMP 1	S8 Appearance and use of the device is good	0,73	24.48	0,53
COMP 2	S9 Size of the screen of the device is big enough	0,81	28.04	0,65
COMP 3	S10 Resolution of the screen is high quality	0,79	27.18	0,62
	Entertainment Services (CR:0,75, AVE: 0,50)			
ENT 1	S5 Mobile service provides wide variety of music	0,63	19.81	0,40
ENT 2	S6 Mobile service provides high quality sound with the music	0,78	25.74	0,61
ENT 3	S7 Mobile service provides high quality videos	0,71	22.98	0,51
	Fit İndices: $\chi 2$= 755,91 (P = 0.000), df: 194, $\chi 2$/df = 3,9, RMSEA: 0,054, GFI = 0.94, AGFI = 0.92, NFI = 0.94, NNFI = 0.94, CFI = 0.95, IFI = 0.90, SRMR = 0.046			

In measurement models, convergent validity occurs while each variable significantly loads to related latent variable. We found that, in the measurement model, all the t-values were higher than 1.96. Thus we assume that this can be considered as a support for convergent validity (Steenkamp and van Trijp 1991). Additionally, the average variance

extracted (AVE) was used to test convergent validity. All AVEs were higher than 0.50, providing sufficient evidence for convergent validity, except for availability dimension (0,47) that AVE was slightly lower than recommended level of 0,50. Factor loadings were also higher than the recommended level of 0.70, supporting convergent validity (Steenkamp and Trijp, 1991).

Discriminant validity occurs when one measure in a construct does not correlate with other measures in other constructs. It is recommended that constructs that do not have high correlations provide discriminant validity (Byrne, 2001). While correlations between factors were not higher than 0.70 (Table 4), we can consider this as a support for discriminant validity. AVE was also used to demonstrate discriminant validity. We can consider that discriminant validity is achieved because AVE for each construct was higher than the squared correlation between any construct in the model (Fornell and Larcker, 1981). Another way to provide discriminant validity is to check for correlations among the factors of the proposed model.

Table 4: Correlations Between Dimensions

	1	2	3	4	5	6
Satisfaction	1					
Availability	0.58	1				
Perceived Risk	0,42	0,52	1			
Easy to Use	0,63	0,50	0,35	1		
Compatibility of Devices	0,51	0,53	0,39	0,43	1	
Entertainment	0,53	0,57	0,44	0,48	0,60	1

The structural equation model (SEM) was used to analyze the relationships between the dimensions of mobile service quality and customer satisfaction. The analysis was conducted by using LISREL 8,51.

Table 5: Results for structural model

	Standardized Solution	t- Value
Compatibility of devices → Entertainment	0,68	14,61
Compatibility of devices → Easy of use	0,51	14,05
Compatibility of devices → Availability	0,60	13,88
Compatibility of devices → Perceived risk	0,21	4,56
Entertainment → Satisfaction	0,13	2,95
Easy of use → Satisfaction	0,39	11,40
Availability → Satisfaction	0,23	5,63
Perceived risk → Satisfaction	0,07	2,15
Availability → Perceived risk	0,39	7,62
Compatibility of devices → Satisfaction	0,11	1,97

$\chi 2$ = 958,89 (p=0,000), df =199, $\chi 2$/df =4,82, RMSEA = 0,06 , GFI = 0.92, AGFI = 0.90, NFI = 0.92, NNFI = 0.93, CFI = 0.94, IFI = 0.94, SRMR = 0.07

According to the results, we found that, as the dimensions of mobile service quality, availability, easy to use, compatibility of devices, perceived risk, and entertainment services have positive influence on customer satisfaction in mobile services while these dimensions have higher t-values than 1,96.

4. Conclusion

Main goal of this study is to develop a scale for mobile service quality considering mobile device, particularly mobile phones. In addition, in the study, after determining the dimensions of mobile service quality, we searched for the effect of these dimensions on customer satisfaction. Results show that there are five dimensions we can consider in mobile service quality, namely availability, perceived risk, easy to use, compatibility of mobile devices and entertainment services, and these dimensions have positive effect on satisfaction as service quality literature suggests positive relationships between service quality and satisfaction. Ease of use and availability are seem to be the most important dimensions affecting satisfaction. As we proposed, the importance of mobile devices is obvious not only directly on satisfaction, also on the other dimensions of mobile service quality. This results show us that customers look for the

proper mobile device. Compatibility of the mobile devices have positive relationships between the other dimensions, meaning that compatibility of the mobile device will increase the entertainment level for the users, will be directly related to ease of use, reaching the mobile services, and positive effect on perceiving risks of using a mobile service.

We also found some positive interactions among mobile service quality dimensions. Availability of the services is related to perceived risk. Customers will feel that while they can reach the mobile services any time they would like, they feel low level of risk. It is particularly important to attract or keep the customers who perceive high security risk while they may make the connection that better devices could help to be secure. Devices and ease of use are directly related. Menu, reaching the information in the device, and design would be important for the service users that they can have the best use with proper devices. Similarly, entertainment the mobile service users will have will be directly related to mobile devices while mobile devices provide music or video for entertainment. Availability is another factor that mobile devices are related to. Customers consider that devices may have influence on making availability better.

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