HOW TO SATISFY MOBILE APPLICATION USERS AND INCREASE THEIR BRAND EQUITY PERCEPTION?

MOBİL UYGULAMA KULLANICILARI NASIL MEMNUN OLUR VE MARKA DEĞERİ ALGILARI NASIL YÜKSELİR?

Hüseyin EKİZLER[*]

Abstract

Nowadays, with the development of technology people's lives have adapted to new situation and individuals have started to carry all the communication, socialization, banking, navigating and many other things they need through applications on their smart phones. The main purpose of this study is to examine the features of the mobile phone applications and the effects of these features on the brand value through users' satisfaction. In this study, the utilitarian benefits, consist of application quality and application utility, hedonic benefits, consist of enjoyment and aesthetics, privacy risk, technicality, and perceived price were determined as the factors assume to have an impact on satisfaction directly, and brand equity correspondingly. All of the concepts used in this study were firstly analyzed with Exploratory Factor Analysis (EFA) and their reliability were measured. Afterwards, the model fit was tested with Confirmatory Factor Analysis (CFA) and path analysis. Out of 731 respondents, that were usable, 368 were selected for EFA and the remaining 363 were selected for CFA and path analysis, where dataset division was randomly performed with Bernoulli distribution. As a result, there were significant relationships between all concepts except the aesthetic dimension and privacy risk of the application.

Keywords: Mobile Applications, Customer Satisfaction, Brand Equity, Structural Equation Modeling

JEL Classification: M31, C81

Özet

Günümüzde teknolojinin gelişmesiyle birlikte insanların hayatları da bu duruma ayak uydurmuş ve bireyler ihtiyaçları olan tüm haberleşme, sosyalleşme, bankacılık, adres bulma ve daha birçok işlemlerini akıllı telefonlarındaki uygulamalar ile gerçekleştirmeye başlamışlardır. Bu çalışmanın temel amacı, kullanıcıların tercih ettikleri mobil telefon uygulamalarında olması gereken özelliklerin neler olduğunu ve bu özelliklerin kullanıcıların memnuniyet derecesi vasıtasıyla uygulamaların marka değerine etkisini incelemektir. Çalışmada kullanıcı memnuniyetini etkilemesi beklenen faydacı değere ait uygulama kalitesi ve uygulama faydası, hedonik değere ait eğlence ve estetik boyutları ile gizlilik riski,

* Asst. Prof. Dr., Marmara University, Department of Business Administration, Göztepe Campus, Istanbul, hekizler@marmara.edu.tr, Orcid Id: 0000-0001-5903-713X

teknik zorluklar ve algılanan fiyat bağımlı değişkenler olarak belirlenmiştir. Bu kavramların kullanıcı memnuniyeti vasıtasıyla marka sadakati, algılanan kalite, bilinirlik ve birliktelikten oluşan marka değeri üzerindeki etkisi ölçülmüştür. Araştırmada kullanılan kavramların tamamı öncelikle keşfedici faktör analizi ile boyutlarına ayrılmış ve güvenirlikleri ölçülmüştür. Sonrasında ise doğrulayıcı faktör analizi ve yapısal eşitlik modeli kullanılarak modelin uyumluluğu test edilmiş ve kavramların etkileri ortaya çıkarılmıştır. Analizlerde toplam 731 cevaplayıcının anket verileri Bernolli dağılımı ile rassal olarak bölünmüş ve 368 adedi keşfedici faktör analizi, kalan 363 adedi ise doğrulayıcı faktör analizi ve yol analizinde kullanılmıştır. Sonuç olarak ise, uygulamanın estetik boyutu ve gizlilik riski kavramları dışındaki tüm değişkenler arasında anlamlı ilişkiler saptanmıştır.

Anahtar Kelimeler: Mobil Uygulamalar, Müşteri Memnuniyeti, Marka Değeri, Yapısal Eşitlik Modeli

JEL Sınıflandırması: M31, C81

1.Introduction

Over the past decade, there have been enormous developments in information, computer, telecommunications and mobile technologies. By this rapid improvement of the technology and its impact on smart phones, the quality, and quantity of web-based applications which were applicable in smart phones also arisen. Especially, continuous advancements in mobile technologies resulted in the wide spread of smart phones. Consequently, the cause for the emergence and developments in mobile applications is an essential to examine. It is known that the number of newly developed mobile applications is increasing rapidly, and also their usage is increasing since most of the smart phone users are also mobile applications users. 25% of downloaded mobile applications are not being used again and most popular 10% applications have market share of 80%.[1] Unfortunately most of the applications are lack of functionality, purpose, aesthetics and they are low qualified.

Despite plenty of applications are created worldwide, their popularity is changing on a country basis. For instance Instagram, Facebook, Twitter, WhatsApp, Google maps, Yandex and some weather applications are very popular in Turkey nowadays. There are also other applications less popular, but still they have considerable amount of users.

Mobile phone usage and in parallel with it, mobile application preferences have both intangible – nonproduct-, and tangible – product – perspectives.[2] In other words, there are some factors that influence the satisfaction of users that also affect brand equity of the applications.

Stated shortly, mobile applications are essential tools in modern life that is an amenity for humans. Taking all of these into consideration, two main research objectives can be stated. The first one is to examine how and why users decide to download/purchase an application and what the essential factors are for the preferences. The second major aim is to examine how these factors influences brand equity of the applications through users' satisfaction.

1 Deloitte, (2011). So many apps so little to download. USA, p.26.
2 Ahmad, N. (2012). Utilitarian and Hedonic Values of Mobile Services: A Preliminary Analysis from the Users' Perspective. Business & accounting review, (9), p.69.

Next sections of this study continued as follows; second section was consisted of the previous studies in the literature regarding to the constructs discussed in our proposed research model. Third section was about methodology to be performed, measurement items and their sources, sample definition and data collection method. In section four and five analysis were performed and conclusion with limitations and managerial implications were explained.

2.Literature Review

Mobile application satisfaction is derived from the VSL (value, satisfaction, loyalty) model initiated in the marketing. This model has been developed in the literature on consumer behavior, strategic marketing, and service management, which examines the relationships between loyalty, satisfaction and customer value.[3] Zeithaml (1988), defined customer value as "consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given".[4] Anderson and Sullivan (1993) stated that in VSL satisfaction is the basic aspect to encourage and sustain loyal customers.[5] Moreover as Churchill and Surprenant (1982) stated post-purchase events like re-patronage and brand loyalty are arisen from the initial purchase with the help of customer satisfaction.[6] The benefits were divided into two main groups as product related benefits which is utilitarian, and non-product related benefits which is hedonic benefits.[7]

2.1.Utilitarian Benefits and Mobile Application Satisfaction

Davis, Bagozzi and Warshaw (1992) and Venkatesh, Thong and Xu (2012), compared the relative strengths of utilitarian and hedonic motivations across different types of information systems. Utilitarian benefits is considered with two parts, which are application quality and application utility. Quality of the application refers the integration, responsiveness and reliability dimension, whereas utility is achieving the desired expectations from the performance of mobile applications.[8],[9]

3   Lam, S.Y. et al. (2004). Customer value, satisfaction, loyalty, and switching costs: an illustration from a business-to-business service context, Journal of the Academy of Marketing Science, 32 (3), p.294.

4   Zeithaml, V.A. (1988). Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence, Journal of Marketing, 52 (3), p.7.

5   Anderson, E.W., Sullivan, M.W. (1993). The antecedents and consequences of customer satisfaction for firms, Marketing Science, 12 (2), p.129.

6   Churchill, Jr. G.A., Surprenant, C. (1982). An investigation into the determinants of customer satisfaction, *Journal of Marketing Research,* 19, p.494.

7   Petruzzellis, L. (2010). Mobile phone choice: technology versus marketing. The brand effect in the Italian market. *European Journal of marketing*, *44*(5), p.618.

8   Davis, F.D. et al. (1992). Extrinsic and intrinsic motivation to use computers in the workplace, Journal of Applied Social Psychology, 22 (14), p.1120.

9   Venkatesh, V. et al. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology, MIS Quarterly, 36 (1), p.162.

Xu, Peak & Prybutok (2015) reflected on the utilitarian benefits of using information systems.[10] Technology Acceptance Model (TAM) represents system utility by perceived usefulness[11], Unified Theory of Acceptance and Use of Technology (UTAUT) represents it by performance expectancy.[12] Researches conducted using UTAUT and TAM models in the field of information technologies revealed that the system utility is a key issue on the users' behavioral intentions. Additionally, system utility was the only factor represents utilitarian benefits both in the Value-based Adoption Model of Technology and Motivation Model of Information Technology Adoption.[13]

Application quality is consistent with the conceptualization of system quality stated by Wixom and Todd (2005), they integrated system quality as a complement to system utility that implies perceived usefulness in TAM.[14] In focus-group interviews Xu, Peak & Prybutok (2015) observed that respondents are interested in application quality whether an application runs well on the smartphone.[15] They are also concerned whether the application provides the utility in a trustworthy way and quickly responding the user inputs. Given the empirical and theoretical evidence in the reviewed academic literature, the first hypothesis of the study can be proposed as:

H1: The utilitarian benefits of mobile applications have effect on users' satisfaction.

2.2.Hedonic Benefits and Mobile Application Satisfaction

Xu, Peak & Prybutok (2015) identified that application aesthetics and enjoyment are named as hedonic benefits. They are nonfunctional benefits which are conveyed by the performance of the applications without significant reinforcement other than using the applications to obtain fun and self-fulfillment.[16] Enjoyment was considered the most prominent dimension to represent hedonic benefits in the Motivation Model of IT Adoption[17] and UTAUT2.[18] Chen, Meservy & Gillenson (2012) discovered that when individuals use utilitarian applications providing timely information, they experience enjoyment.[19]

10   Xu, C. et al. (2015). A customer value, satisfaction, and loyalty perspective of mobile application recommendations, Decision Support Systems, 79, p.176.

11   Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, MIS Quarterly, 13 (3), p.326.

12   Venkatesh, V. et al. (2003). User acceptance of information technology: toward a unified view, *MIS Quarterly*, 27 (3), p.449.

13   Kim, H. W. et al. (2007). Value-based adoption of mobile internet: an empirical investigation, *Decision Support Systems,* 43 (1), p.1

14   Wixom, B.H., Todd, P.A. (2005). A theoretical integration of user satisfaction and technology acceptance, Information Systems Research, 16 (1), p.92.

15   Xu, et al. 2015, p.176.

16   Xu, et al. 2015, p.179.

17   Davis, et al. 1992, p.1120.

18   Venkatesh V. et al. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology, MIS Quarterly, 36 (1), p.162.

19   Chen L. et al. (2012). Understanding information systems continuance for information-oriented mobile applications,

Signaling Theory[20], the Visual Rhetoric Theory[21] and the "beauty is good" stereotype[22] are the researches clarifying the impact of system aesthetics on user behavior. Aesthetics also has an influence on user assessments of application's visual designs on smartphones.[23] Additionally, research on Airbnb experience, a mobile phone application uses sharing economy system for accommodation, stated a significant positive impact of hedonic value on customer satisfaction.[24] Therefore, the following hypothesis is:

H2: The hedonic benefits of mobile applications have effect on users' satisfaction.

2.3.Mobile Application Satisfaction and Mobile Application Features

Individuals expect the mobile applications protect user input data and not allow malicious software to access personal information and consumers consider safety issue while using related applications.[25]

Privacy risk stated as a negative dimension in literature and the evaluation of the product-related risk is considered in the post-consumption phase.[26] According to Ghosh & Swaminatha (2001), privacy risk is a serious problem in technology based commerce and unfortunately mobile applications offer unlimited ways for collecting and using private information from application users.[27] Recent researches revealed that more than half of the Americans tends to behave not to installing or removing an application due to concerns about their privacy issues.[28] Kayworth & Widden (2010) reported that consumers are staying away from the websites and applications that require personal information.[29] Building from these observations, this study proposes the third hypothesis as:

H3: Privacy risk has an effect user's satisfaction.

Well-designed mobile application is the one that is user-friendly, simple, innovative, and meets the expectations of users effectively and quickly. Technicality was defined as perceived difficulty of use for

Communications of the Association for Information Systems, 30, p.136.

20   Wells, J.D. et al. (2011). What signal are you sending? How website quality influences perceptions of product quality and purchase intentions, MIS Quarterly, 35 (2), p.381.

21   Cyr, D. et al. (2009). Exploring human images in website design: a multi-method approach, MIS Quarterly, 33 (3), p.547.

22   Tractinsky, N. et al. (2000). What is beautiful is usable, Interacting with Computers, 13 (2), p.133.

23   Ha, I. et. al (2007). Determinants of adoption of mobile games under mobile broadband wireless access environment, Information Management, 44 (3), p.280.

24   Lee, S., Kim, D.Y. (2018). The effect of hedonic and utilitarian values on satisfaction and loyalty of Airbnb users. International Journal of Contemporary Hospitality Management, 30(3), p.1341.

25   Cho, D.Y. et al. (2007). Analysis of trust in internet and mobile commerce adoption. 40th Hawaii international conference on system science" (HICSS), Waikoloa

26   Sweeney, J.C. et al. (1999). The role of perceived risk in the quality–value relationship: a study in a retail environment, Journal of Retailing, 75 (1), p.80.

27   Ghosh, A.K., Swaminatha T.M., (2001). Software security and privacy risks in mobile ecommerce, Communications of the ACM, 44 (2), p.54.

28   Harris, K.D. (2013). Privacy On The Go: Recommendations for the Mobile Ecosystem, pp.1.

29   Kayworth, T., Whitten, D. (2010). Effective information security requires a balance of social and technology factors. *MIS Q Executive* 9(3), p.168.

mobile applications.[30] Simplicity for the end users implied security, regular updates, high performance, feedbacks, personalization options, social media integration, are the key specifications for mobile applications.[31] Since it is a non-monetary disadvantage, technicality causes psychological disorders such as irritation, anxiety and mental fatigue.[32] Based on these, the next hypothesis can be stated as:

H4: Technicality has an effect on user's satisfaction.

Sustaining the company's turnover, pricing strategy is one of the most essential part in marketing. The customers usually encode the prices rather than the objective price of products.[33] The ratio of output, such as utility or quality of service/product, and input, such as the amount paid is the perceived price in consumer perspective. In this context perceived price is a significant financial criteria to select the vendor. The concept implies perceived price has an impact on perceived utility is widely discussed in marketing literature. Mobile applications' price consist of in-app purchases and/or download charges, which in turn satisfies the costumers with value-added services associated with VSL model. Hence, the following hypothesis can be stated as:

H5: Perceived price has an effect users' satisfaction.

2.4.Mobile Application Satisfaction and Brand Equity

Brand equity has been expressed with numerous definitions and explained with different of concepts in the literature. Among all these definitions, most accepted one is stated by Srivastava and Shocker, (1991) in which "brand equity is the incremental value of a product due to its brand name".[34] High familiarity and awareness of the mentioned brand, customer's requirement to some unbreakable, positive, and special brand associations in their mind is the brand.[35] The concepts related with brand can be classified in four dimensions as; brand loyalty, brand awareness, brand association and perceived quality.[36] Considering these dimensions, brand equity is the set of stimuli's linked in the memory of customers to a specific brand. According to Aaker & Keller (1990) and Keller (1993), links will be more powerful with the recommendation of others.[37],[38]

30   Xu, et al., 2015, p.178.

31   Dholakia, U. M. et al. (2004). A social influence model of consumer participation in network-and small-group-based virtual communities. International journal of research in marketing, 21(3), p. 245.

32   Kim, et al. , 2007, p.3

33   Zeithaml, V. A. (1982). Consumer response to in-store price information environments, Journal of Consumer Research, 8 (4), p.361.

34   Srivastava, R. K., Shocker, A. D. (1991). Brand equity: a perspective on its meaning and measurement; technical working paper.

35   Keller, K.L. (2003), Strategic Brand Management: Building, Measuring and Managing Brand Equity, 2nd ed., Prentice-Hall, Englewood Cliffs, NJ.

36   Yoo, B., Donthu, N. (2001). Developing and validating a multidimensional consumer-based brand equity scale, Journal of Business Research, 52, p.6.

37   Aaker, D.A.,Keller, K.L. (1990). Consumer evaluations of brand extensions. Journal of marketing, 54(1), p.32.

38   Keller, K.L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. Journal of marketing, 57(1), p.11.

In the field of hospital marketing a study in Korea revealed an indirect impact of satisfaction on brand awareness that is one of the subdimension of brand equity.[39] Similarly, Dennis et al. (2016) suggested that higher education level students' satisfaction has a significant impact on their universities brand loyalty.[40] In addition satisfied customers are more likely to re-purchase and use the mobile applications in future (Hult et al., 2018).[41] For this reason it is stated that:

H6: Users' satisfaction has an effect on brand equity.

Figure 1 shows the relationships stated in the hypothesis among the constructs discussed in the previous sections.
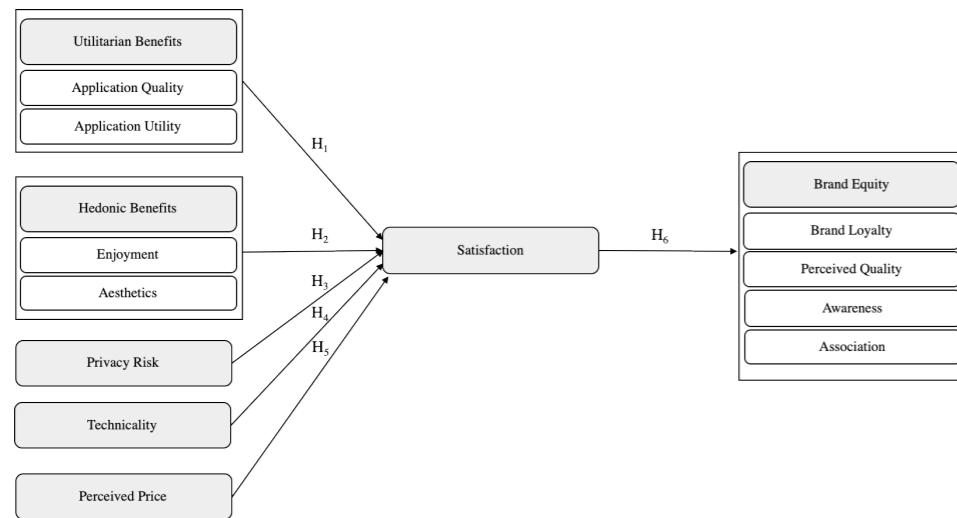
Figure 1: Proposed Research Model

3.Methodology

3.1.Instrument

The survey questionnaire measures the seven constructs in the above proposed research model as depicted in Figure 1. Items from validated measurement instruments used before have been chosen and adapted to guarantee the validity of the survey instruments. Most of the items were adapted from instruments previously prepared.[42] The first instrument includes two utilitarian benefits dimensions. These are application quality and application utility, and both of them were adapted from Davis, (1989) and Wixom & Todd, (2005).[43],[44] The scales assessing hedonic benefits were measuring two dimensions as well. The first one, assessing application aesthetics was developed based on earlier inquiries by researchers such as Cyr, Head & Ivanov (2006), Kim, Gupta & Koh (2011) and Van der Heijden, (2003).[45],[46],[47] The second dimension of hedonic benefits was application enjoyment, and it was based on the study of Van der Heijden, (2004).[48]

Measurement instruments of satisfaction, technicality and perceived price was adopted from Xu et al. (2015).[49] The scale for assessing privacy risk was based on the study of Dinev & Hart, (2006) and Kim et al., (2008).[50],[51] Also, for the purpose of this research, the multidimensional consumer-based brand equity scale developed by Yooa and Donthu (2001) was used.[52] Five-point Likert scale approach was used for assessing all the constructs from "Strongly Disagree" (1) to "Strongly Agree" (5). Table 1 illustrates the summary of all instruments. All construct items are listed in the Appendix.

Table 1: Instruments and Sources

Constructs	# of Items	Source
Utilitarian Benefits	11	Davis (1989); Wixom & Todd (2005)
Hedonic Benefits	10	Cyr, Head & Ivanov (2006); Kim & Koh (2011); Van der Heijden (2004)
Perceived Price	4	
Technicality	4	Xu, Peak & Prybutok (2015)
Satisfaction	4	
Privacy Risk	6	Dinev & Hart (2006); Kim et al. (2006)
Brand Equity	10	Yooa & Donthu (2001)

3.2.Sample and Data Collection

We aim to find out the effects of mobile application's features on the customer based brand equity through satisfaction levels of the users. We created a questionnaire consisting of the dimensions on the proposed research model and the questionnaire was uploaded to online survey tool called Google Forms. Before uploading the questionnaire it was translated to Turkish language and back translations were done with academics who were competent both in English and marketing

39   Kim, K.H., et al. (2008). Brand equity in hospital marketing. Journal of Business Research, 61(1), p.79.

40   Dennis, C. et al. (2016). The role of brand attachment strength in higher education. Journal of Business Research, 69(8), p.3053.

41   Hult, G.T.M. et al. (2018). Antecedents and Consequences of Customer Satisfaction: Do They Differ Across Online and Offline Purchases?. Journal of Retailing.

42   Xu, et al., 2015, p.182.

43   Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, MIS Quarterly, 13 (3), p.330.

44   Wixom B.H., Todd P.A., 2005, p.98.

45   Cyr, et al., 2009, p. 560.

46   Kim, H.W. et al. (2011). Investigating the intention to purchase digital items in social networking communities: a customer value perspective, Information Management, 48 (6), p.232.

47   Van der Heijden, H. (2003). Factors influencing the usage of websites: the case of a generic portal in The Netherlands, Information Management, 40 (6), p.547

48   Van der Heijden, H. (2004). User acceptance of hedonic information systems, MIS Quarterly, 28 (4), p.700

49   Xu, et al., 2015, p.182.

50   Dinev, T., Hart, P., (2006). An extended privacy calculus model for E-commerce transactions, Information Systems Research, 17 (1), p.73.

51   Kim, et al. 2008, p.560.

52   Yooi Donthu, 2001, p. 11.

field to ensure consistency. The link of the questionnaire remained active between December, 21 2018 and January, 30 2019. Since the sample should use at least one mobile application, in the beginning of the questionnaire we asked "Do you use any mobile application?" to eliminate the sample units that are not concerned with the research objective. Convenience sampling technique was preferred, because of the advantage of collecting the data in a least costly and timely manner. During the period of data collection, totally we obtained 793 responses in which 731 of these were suitable and used as primary data for the analysis. The remaining 62 of the responses are excluded from the analysis due to missing values and not using any mobile application.

4.Findings

4.1.Descriptive Statistics

The frequencies indicated that there are not any missing data, and the test of normality showed the normal distribution of the data for each item.

Table 2: Descriptive statistics of the sample's characteristics

		Frequency	Percentage
Gender	Female	411	56.2%
	Male	320	43.8%
Marital Status	Married	220	30.1%
	Single	511	69.9%
Education	Primary School	4	0.5%
	Secondary School	5	0.7%
	High School	96	13.1%
	Bachelor	517	70.7%
	Master	82	11.2%
	PhD	27	3.7%
Income	Less than 2,000 TL	117	16.0%
	2,001-3,000 TL	168	23.0%
	3,001-4,000 TL	96	13.1%
	4,001-5,000 TL	85	11.6%
	5,001-6,000 TL	110	15.1%
	More than 6,000 TL	155	21.2%
Mobile Phone Brand	IPhone	366	50.1%
	Samsung	206	28.2%
	Other	159	21.8%
Operating System	IOS	366	50.1%
	Android	365	49.9%
Mobile Application Usage	More than 10 times per day	440	60.2%
	5-10 times per day	137	18.7%
	2-5 times per day	113	15.5%
	Once per day	25	3.4%
	Once per week	16	2.2%

Descriptive statistics of the respondents were given in Table 2, regarding to the results the respondents were between 18 and 71 years old and had a mean age of 27.739 with a standard deviation of 12.425 years, located in different cities of Turkey. Totally 411 (56.2%) of them were female, whereas 320 (43.8%) were male. Majority of the sample had a bachelor's degree or higher level of education (totally 85.6%). In terms of the operating system classification, the sample was almost divided into halves, 50.1% were using IOS whereas 49.9% were Android. A significant number of the respondents (n=440) indicated that they are using mobile applications more than 10 times per day, followed by 5-10 times per day. From these information we can state approximately 80% of the respondents use their mobile application more than 5 times on a daily basis.

4.2.Data Analysis

Exploratory Factor Analysis (EFA) to reveal the hidden structure and Reliability Analysis to test the consistency and reliability of the constructs were performed using SPSS 25. Afterwards Confirmatory Factor Analysis (CFA) to confirm the construct structure and Path Analysis to test the relationships hypothesized in the research model were performed using IBM AMOS 24.

4.2.1.Exploratory and Confirmatory Factor Analysis

Since it is necessary to test the validity of the factor model identified by EFA requires a different set of data, we first selected an analysis sample for conducting EFA and a holdout sample for conducting CFA.[53] The sample consists of 731 questionnaires in total. Almost half of the sample (n = 368) was used for EFA, with the holdout sample (n = 363) CFA was conducted to examine the hidden structure of the scale. For selecting analysis sample, we used random sampling technique with Bernoulli distribution.

Kaiser-Meyer-Olkin Sampling Adequacy Measure and Bartlett's test of Sphericity results indicated dataset is appropriate for EFA and the items have sufficient amount of relation for conducting the analysis (KMO = 0.922, x^2 Bartlett test (946) = 16759.912, p = 0.000). Two items of application quality (AQ1, AQ2), one item of enjoyment (E3), application utility (AU6) and similarly perceived price (PP3) were omitted from the analysis because of low factor loadings. Factor loadings of each item should be above 0.50.[54]

Table 3 reflects both EFA and CFA results with the remaining items. The accepted amount of each factor's variance extraction is at least 5% and totally minimum variance extraction is 60% in social sciences.[55] In this respect the findings were adequate since total variance extraction of nine factors was 79.52 % and the variance range of factors were changing between 5.4 % – 18.6%.

53   Lattin, J.M. et al. (2003). Analyzing multivariate data, Thomson Brooks/Cole, USA

54   Durmus B., et al. (2016). Sosyal Bilimlerde SPSS'le Veri Analizi. 6th ed. Beta Basim Yayım Dağıtım.

55   Netemeyer, R.G., et al. (2003). Scaling Procedures: Issues and Applications, Sage Publications, Thousand Oaks.

Table 3: EFA and CFA Results

Factor/Items	EFA			CFA		
	Factor Loading	Variance	α	Factor Loading	CR	AVE
Factor 1: Brand Equity						
AW2	0.847			0.859		
AW1	0.843			0.866		
AS1	0.834			0.849		
LO3	0.827			0.801		
LO2	0.813			0.800		
QL2	0.806	18.584	0.958	0.853	0.955	0.678
QL1	0.792			0.853		
LO1	0.790			0.771		
AS3	0.783			0.795		
AS2	0.765			0.779		
Factor 2: Privacy Risk						
PR4	0.913			0.939		
PR2	0.913			0.871		
PR1	0.899			0.847		
PR5	0.885	10.862	0.947	0.834	0.941	0.727
PR6	0.857			0.780		
PR3	0.854			0.838		
Factor 3: Aesthetics						
AE3	0.902			0.945		
AE2	0.887			0.921		
AE4	0.834	10.407	0.945	0.888	0.946	0.777
AE1	0.819			0.841		
AE5	0.765			0.806		
Factor 4: Application Utility						
AU4	0.845			0.759		
AU2	0.841			0.825		
AU5	0.748	8.303	0.881	0.889	0.894	0.630
AU3	0.735			0.620		
AU1	0.732			0.849		
Factor 5: Technicality						
T2	0.908			0.922		
T4	0.867			0.804		
T3	0.862	7.197	0.898	0.826	0.902	0.697
T1	0.814			0.754		
Factor 6: Enjoyment						
E4	0.813			0.831		
E5	0.777			0.809		
E2	0.761	6.769	0.933	0.923	0.924	0.753
E1	0.729			0.901		
Factor 7: Satisfaction						
S3	0.766			0.931		
S2	0.751			0.950		
S1	0.722	5.985	0.946	0.864	0.944	0.809
S4	0.709			0.848		
Factor 8: Perceived Price						
PP2	0.911			0.961		
PP1	0.888	5.983	0.926	0.915	0.929	0.813
PP4	0.868			0.824		
Factor 9: Application Quality						
AQ4	0.834			0.929		
AQ5	0.800	5.432	0.914	0.910	0.917	0.753
AQ3	0.783			0.819		

Assessing the validity of the constructs; square root of average variance extracted (AVE) were greater than the inter-construct correlations (Table 4), indicated the evidence of discriminant validity. Also, all AVE values were greater than 0.50 (Table 3) indicated the evidence of convergent validity. Internal consistency and reliability of the constructs among the items were measured by both Cronbach's alpha and composite reliability (CR) and all of them were exceeding the threshold level of 0.70 (Table 3).

Table 4: Correlations

	1	2	3	4	5	6	7	8	9
1. Brand Equity	**0.823**								
2. Satisfaction	0.687	**0.899**							
3. Application Utility	0.432	0.494	**0.794**						
4. Application Quality	0.524	0.528	0.520	**0.887**					
5. Enjoyment	0.486	0.526	0.297	0.454	**0.868**				
6. Aesthetics	0.376	0.443	0.344	0.379	0.694	**0.882**			
7. Privacy Risk	0.026	-0.020	-0.025	-0.012	-0.038	-0.042	**0.853**		
8. Technicality	-0.218	-0.235	-0.094	-0.167	-0.034	0.059	0.106	**0.835**	
9. Perceived Price	0.392	0.404	0.271	0.339	0.220	0.201	0.049	-0.120	**0.902**

Note: Diagonal values are the square root of AVEs

X^2 goodness of fit, X^2 (835)= 1726.03 (p=0.000) demonstrated observed and estimated covariance matrices significantly differ. Nonetheless, chi-square test is generally sensitive to sample size, for this reason assessing the model fit alternative goodness of fit indexes have been developed.[56] Comparative of Fit Index (CFI), Goodness of Fit Index (GFI) and Tucker-Lewis Fit Index (TFI) were 0.972, 0.903 and 0.968 respectively and Root Mean Square Error of Approximation (RMSEA) value was 0.038. These indexes indicated the proposed first order model as appropriate and fit.

4.2.2.Structural Model

Since the objective of this study was to identify the impact of utilitarian benefits, hedonic benefits, privacy risk, technicality and perceived price on brand equity through satisfaction a structural model was tested. Figure 2 demonstrated the structural model. Path analysis results indicated a good fit of the model (X^2 (609) = 1426.940, p=0.000; GFI=0.905; AGFI=0.885; CFI=0.969; TLI=0.965; RMSEA=0.043).
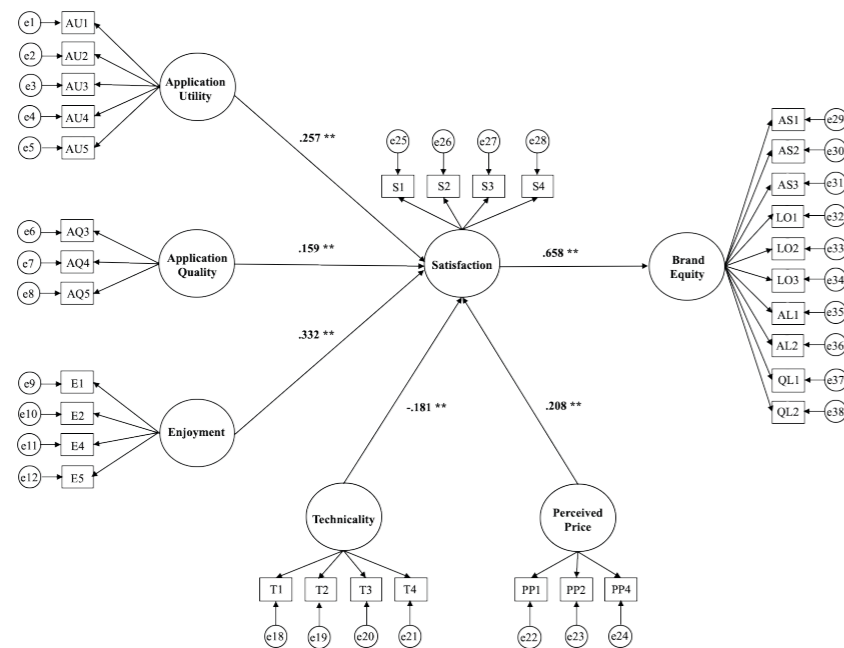
Figure 2: Structural Model

Having considered relationships among the constructs, the paths of utilitarian benefits from both application utility and application quality to satisfaction were found as significant. Thus *H1* was

---

56   Hair, J.F.J., et al. (1998). Multivariate Data Analysis, 5th ed, Prentice Hall, Upper Saddle River, New Jersey.

supported and positive impact of utilitarian benefits on mobile application users' satisfaction was revealed (*H1a*: *β*=0.257, *p*<0.01 and *H1b*: *β*=0.159, *p*<0.01) Same interpretation is also convenient for the paths from enjoyment and perceived price to satisfaction, as these hypothesis was also supported and positive impacts of mentioned constructs were referred (*H2a*: *β*=0.208, *p*<0.01 and *H5*: *β*=0.332, *p*<0.01)

Table 5: Results of Path Model

	β	t	Decision
Application Utility → Satisfaction	0.257	6.344 *	Supported
Application Quality → Satisfaction	0.159	4.080 *	Supported
Enjoyment → Satisfaction	0.332	6.977 *	Supported
Aesthetics → Satisfaction	ns	-	Not Supported
Privacy Risk → Satisfaction	ns	-	Not Supported
Technicality → Satisfaction	-0.181	-5.681 *	Supported
Perceived Price → Satisfaction	0.208	6.792 *	Supported
Satisfaction → Brand Equity	0.658	16.994 *	Supported

X^2 (609, N=731) = 1426.940, p=0.000; GFI=0.905; AGFI=0.885; CFI=0.969; TLI=0.965; IFI=0.970; RMSEA=0.043
*Note * p< .001*
GFI=Goodness of Fit; AGFI=Adjusted Goodness of Fit; CFI=Comparative Fit Index; TLI= Tucker-Lewis Fit Index; IFI=Incremental Fit Index; RMSEA=Root Mean Square Error Approximation; ns= not significant

Technicality had a significant impact on satisfaction, reversely (*H4*: *β*=-0.181, *p*<0.01). In other words, as the technical details of the mobile application became harder, satisfaction level of the users were declining. Users' satisfaction had a strong positive significant impact on every dimension of brand equity including brand loyalty, perceived quality, awareness and association (*H6*: *β*=0.658, *p*<0.01) Apart from these implications, aesthetics dimension of hedonic benefits (*H2b*: *p*>0.05) and privacy risk (*H3*: *p*>0.05) had an insignificant result with users' satisfaction stating that they had no impact.

5.Conclusion

Recent developments in mobile technologies, the increase of the number of smart phone users has led to the developments in mobile applications. It is known that the number of developed mobile applications for social media (Twitter, Instagram, Facebook, Snapchat), for video or music streaming (Youtube, Spotify, Apple Music, Muud), for communication (WhatsApp, Viber, FacebookMessenger), for navigation (Google maps, Yandex), for weather (AccuWeather) are popular, yet there are also many less popular mobile applications, so the problem stated was related with the popularity of the applications.

Hüseyin EKİZLER

Marmara Üniversitesi İktisadi ve İdari Bilimler Dergisi • Cilt: 41 • Sayı: 1 • Haziran 2019, ISSN: 2149-1844, ss/pp. 126-144

The main objective of this study was to establish the factors affecting mobile application satisfaction and correspondingly brand equity of applications. This study actually was consisting of two main parts. The first five hypothesis was regarding the factors related with mobile applications presumed to have an effect on users' satisfaction. We analyzed the users' both product and non-product perspective of benefits on satisfaction, in addition privacy risk, technical difficulty, and perceived price roles was also considered. On the second part, where the last hypothesis was appeared, we examined the impact of users' satisfaction on brand equity involving four sub-dimensions as brand loyalty, perceived quality, awareness and association. Consequently, most of the claims in the study were supported. Apart from the aesthetic aspects of mobile applications and privacy risk issues of users, it is concluded that all the constructs had a direct or indirect effect on brand value. Certainly, the empirical findings will be useful for future studies.

The major contribution of this research is the empirical examination of the proposed model in Turkey as depicted in Figure 1. The main findings of this study are related with testing the hypotheses by using the Structural Equation Modeling technique that takes into account the relations of observed and latent variables together.

The implications of the present study can be theoretical and practical. In terms of theoretical implications, the findings can be used for further academic studies. The practical implications are that the findings might be implemented for the development of the mobile applications. Moreover, users' satisfaction was found to be an important factor for brand equity.

Interpreting the results of the study, there are two limitations to be considered. The first limitation is that cross-sectional data were used, and this limitation did not permit causal inferences about the longitudinal interplay between the variables. It is strongly recommended that further research should be a longitudinal study in which the variables could be measured at different time periods, so this would provide some additional insights. Besides, the use of an experimental design in future studies would strengthen causal inferences.

References

AAKER, D.A., & Keller, K.L. (1990). Consumer evaluations of brand extensions. Journal of marketing, 54(1), 27-41.

AHMAD, N. (2012). Utilitarian and Hedonic Values of Mobile Services: A Preliminary Analysis from the Users' Perspective. *Business & accounting review*, (9), 69-83.

ANDERSON, E.W. & Sullivan, M.W. (1993). The antecedents and consequences of customer satisfaction for firms, *Marketing Science*, 12 (2), 125–143.

BHATTACHERJEE, A. (2001). Understanding information systems continuance: an expectation – confirmation model, *MIS Quarterly*, 25 (3), 351–370.

CHEN L., Meservy, T.O. & Gillenson M. (2012). Understanding information systems continuance for information-oriented mobile applications, *Communications of the Association for Information Systems*, 30, 127–146.

CHEN, Z. & Dubinsky, A.J. (2003). A conceptual model of perceived customer value in ecommerce: a preliminary investigation, *Psychology and Marketing*, 20 (4), 323–347.

CHO, D.Y., Kwon, H.J., & Lee, H.Y. (2007). Analysis of trust in internet and mobile commerce adoption. In Proceedings of the 40th Hawaii international conference on system science (HICSS), Waikoloa (pp. 1–10).

CHURCHILL Jr. G.A. & Surprenant, C. (1982). An investigation into the determinants of customer satisfaction, *Journal of Marketing Research,* 19, 491–504.

CYR, D. Head, M., Larios, H., & Pan, B. (2009). Exploring human images in website design: a multi-method approach, *MIS Quarterly*, 33 (3), 539-566.

CYR, D., Head, M. & Ivanov, A. (2006). Design aesthetics leading to m-loyalty in mobile commerce, *Information & Management*, 43 (8), 950–963.

DAVIS F. D., Bagozzi R.P., & Warshaw P.R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace, *Journal of Applied Social Psychology*, 22 (14), 1111–1132.

DAVIS, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly*, 13 (3), 319–340.

DELOITTE, (2011). So many apps so little to download. USA.

DENNIS, C., Papagiannidis, S., Alamanos, E., & Bourlakis, M. (2016). The role of brand attachment strength in higher education. *Journal of Business Research*, 69(8), 3049-3057.

DHOLAKIA, U.M., Bagozzi, R.P., & Pearo, L.K. (2004). A social influence model of consumer participation in network-and small-group-based virtual communities. International journal of research in marketing, 21(3), 241-263.

DINEV, T. & Hart, P., (2006). An extended privacy calculus model for E-commerce transactions, *Information Systems Research,* 17 (1), 61–80.

DODDS, W.B., Monroe, K.B. & Grewal, D. (1991), Effects of price, brand, and store information on buyers' product evaluations, *Journal of Marketing Research*, 28 (3), 307–319.

DURMUS B., Yurtkoru S., & Cinko M. (2016). *Sosyal Bilimlerde SPSS'le Veri Analizi.* 6th ed. Beta Basim Yayim Dağıtım.

GHOSH, A.K. & Swaminatha T.M. (2001). Software security and privacy risks in mobile ecommerce, *Communications of the ACM,* 44 (2), 51–57.

HA I., Yoon Y. & Choi, M. (2007). Determinants of adoption of mobile games under mobile broadband wireless access environment, *Information Management*, 44 (3), 276–286.

HAIR, J.F.J., Anderson, R.E., Tatham, R.L., Black, W.C., (1998). Multivariate Data Analysis, 5th ed, Prentice Hall, Upper Saddle River, New Jersey.

HARRIS, K.D. (2013), "Privacy On The Go: Recommendations For The Mobile Ecosystem"

HARRISON-Walker, L.J. (2001). The measurement of word-of-mouth communication and an investigation of service quality and customer commitment as potential antecedents, *Journal of Service Research,* 4 (1), 60–75.

HULT, G.T.M., Sharma, P.N., Morgeson III, F.V., & Zhang, Y. (2018). Antecedents and Consequences of Customer Satisfaction: Do They Differ Across Online and Offline Purchases?. *Journal of Retailing*. (https://doi.org/10.1016/j.jretai.2018.10.003)

KAYWORTH T., Whitten D. (2010) Effective information security requires a balance of social and technology factors. *MIS Q Executive* 9(3):163–175

KELLER, K.L. (1993). Conceptualizing, measuring, and managing customer-based brand equity. Journal of marketing, 57(1), 1-22.

KELLER, K.L. (2003), Strategic Brand Management: Building, Measuring and Managing Brand Equity, 2nd ed., Prentice-Hall, Englewood Cliffs, NJ.

KIM, D.J., Ferrin, D.L. & Rao, H.R. (2008). A trust-based consumer decision-making model in electronic commerce: the role of trust, perceived risk, and their antecedents, *Decision Support Systems*, 44 (2), 544–564.

KIM, H.W., Chan H.C. & Gupta S., (2007). Value-based adoption of mobile internet: an empirical investigation, *Decision Support Systems,* 43 (1), 111–126.

KIM, H.W., Gupta, S. & Koh, J., (2011). Investigating the intention to purchase digital items in social networking communities: a customer value perspective, *Information Management,* 48 (6), 228–234.

KIM, K.H., Kim, K.S., Kim, D.Y., Kim, J.H., & Kang, S.H. (2008). Brand equity in hospital marketing. Journal of Business Research, 61(1), 75–82.

LAM, S.Y., Shankar, V., Erramilli, M.K., & Murthy, B. (2004). Customer value, satisfaction, loyalty, and switching costs: an illustration from a business-to-business service context, *Journal of the Academy of Marketing Science*, 32 (3), 293–311.

LATTIN, J.M., Carroll, J.D., & Green, P.E. (2003). Analyzing multivariate data, Thomson Brooks/Cole, USA

LEE, S., & Kim, D.Y. (2018). The effect of hedonic and utilitarian values on satisfaction and loyalty of Airbnb users. *International Journal of Contemporary Hospitality Management*, *30*(3), 1332-1351.

LIN, T.C., Wu, S., Hsu, J.S.C., & Chou, Y.C. (2012). The integration of value-based adoption and expectation–confirmation models: an example of IPTV continuance intention, *Decision Support Systems*, 54, 63–75.

NETEMEYER, R.G., Bearden, W.O., Sharma, S. (2003). Scaling Procedures: Issues and Applications, Sage Publications, Thousand Oaks.

PETRUZZELLIS, L. (2010). Mobile phone choice: technology versus marketing. The brand effect in the Italian market. *European Journal of marketing*, *44*(5), 610-634.

SEKERAN U. & Bougie R. (2013*). Research Methods for Business*. 6th ed. John Wiley & Sons Ltd.

SRIVASTAVA, R.K., & Shocker, A.D. (1991). Brand equity: a perspective on its meaning and measurement; technical working paper. na.

SWEENEY, J.C., Soutar, G.N. & Johnson, L.W. (1999). The role of perceived risk in the quality–value relationship: a study in a retail environment, *Journal of Retailing*, 75 (1), 77–105.

TRACTINSKY, N., Katz, A.S. & Ikar, D. (2000). What is beautiful is usable, *Interacting with Computers*, 13 (2), 127–145.

VAN der Heijden, H. (2003). Factors influencing the usage of websites: the case of a generic portal in The Netherlands, *Information Management*, 40 (6), 541–549.

VAN der Heijden, H. (2004). User acceptance of hedonic information systems, *MIS Quarterly*, 28 (4), 695–704.

VENKATESH V., Morris, M. G., Davis, G.B., & Davis, F.D. (2003). User acceptance of information technology: toward a unified view, *MIS Quarterly*, 27 (3), 425–478.

VENKATESH V., Thong J.Y.L. & Xu X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology, *MIS Quarterly*, 36 (1), 157–178.

WELLS, J.D., Valacich, J.S. & Hess T.J. (2011). What signal are you sending? How website quality influences perceptions of product quality and purchase intentions, *MIS Quarterly*, 35 (2), 373-396.

WIXOM B.H. & Todd P.A., (2005). A theoretical integration of user satisfaction and technology acceptance, *Information Systems Research*, 16 (1), 85–102.

XU C., Peak D., & Prybutok V., (2015). A customer value, satisfaction, and loyalty perspective of mobile application recommendations, *Decision Support Systems*, 79, 171–183.

YANG, Z. & Peterson, R.T. (2004). Customer perceived value, satisfaction, and loyalty: the role of switching costs, *Psychology and Marketing*, 21 (10), 799–822.

YOO, B. & Donthu, N., (2001). Developing and validating a multidimensional consumer-based brand equity scale, *Journal of Business Research*, 52, 1-14.

ZEITHAML, V.A. (1982). Consumer response to in-store price information environments, *Journal of Consumer Research*, 8 (4), 357–369.

ZEITHAML, V.A., (1988). Consumer perceptions of price, quality, and value: a means-end model and synthesis of evidence, *Journal of Marketing*, 52 (3), 2–22.

APPENDIX

Measurement Items

Utilitarian Benefits	
AU1	The application enables me to do it more quickly.
AU2	The application helps me be more effective.
AU3	The application helps me be more productive.
AU4	The application saves me time to use it.
AU5	The application makes it easier to do it. *(Reverse)*
AU6	The application is useful to me.
AQ1	The application is reliable.
AQ2	The application can serve a variety of my needs.
AQ3	The application is smoothly integrated into my smartphone.
AQ4	The application is available whenever I want to use it.
AQ5	The application responds to my request in a timely fashion.
Hedonic Benefits	
AE1	The interface of my application is aesthetically appealing.
AE2	The interface of my application is attractive.
AE3	The interface of my application is aesthetically designed.
AE4	The overall look and feel of the application is visually appealing.
AE5	The interface of my application pleases my senses.
E1	I find using the application to be enjoyable.
E2	Using the application is pleasant.
E3	Using the application is dull.
E4	I have fun using the application.
E5	I enjoy using the application.
Technicality	
T1	I think the application is difficult to use.
T2	Learning to operate the application is difficult for me.
T3	My interaction with the application requires a lot of mental effort.
T4	It is difficult for me to become skillful at using the application.
Perceived Price	

PP1	I think the fee that I paid for the use of this app is acceptable.
PP2	I think the fee that I paid for the use of this app is reasonable.
PP3	I think the fee I paid for the use of this app is high.
PP4	I am pleased with the fee that I paid for the use of this app.

Privacy Risk

PR1	The application may disclose my personal information to others.
PR2	The application may share my personal information to others. *(Reverse)*
PR3	The application may track my habits of smart phone use.
PR4	The application may collect and use my personal information in an unintended way.
PR5	The application may cause me to lose control over my privacy.
PR6	The application may lead to a loss of my privacy without my knowledge.

Satisfaction

S1	I feel very satisfied with the overall experience of using the application.
S2	I am very pleased with the overall experience of using the application.
S3	I am very contended with the overall experience of using the application. *(Reverse)*
S4	I feel very delighted with the overall experience of using the application.

Brand Equity

LO1	I consider myself as a loyal customer of this application.
LO2	This application will be my first choice.
LO3	I will not buy other applications if this application is available.
QL1	The likely quality of this application is extremely high.
QL2	The likelihood that this application will be functional is very high.
AW1	I can recognize this application among other competing applications.
AW2	I am aware of this application.
AS1	Some characteristics of this application come to my mind quickly.
AS2	I can quickly recall the symbol or logo of this application.
AS3	I do not have any difficulty in imagining this application in my mind.