



ROUTE

EDUCATIONAL & SOCIAL SCIENCE JOURNAL

ISSN: 2148-5518



Volume 7, Issue 3, March 2020, p. 716-730

**İstanbul / Türkiye**

**Article Information**

***Article Type: Research Article***

***This article was checked by iThenticate.***

**Article History:**

**Received**

20/01/2020

**Received in revised form**

20/01/2020

**Accepted**

14/03/2020

**Available online**

15/03/2020

## **MOBILE APPLICATION USAGE CULTURE AND SOCIAL IMPACT: EXAMPLE OF E-PULSE IN PERSONAL HEALTH RECORDS**

**MOBİL UYGULAMA KULLANIM KÜLTÜRÜ VE SOSYAL ETKİ:  
KİŞİSEL SAĞLIK KAYITLARINDA E-NABİZ ÖRNEĞİ**

**Özel SEBETCİ<sup>1</sup>**

**Abstract**

The use of mobile applications covers every area of social life day by day. Therefore, it has become very meaningful to talk about mobile application culture. The subject of the research is the factors that affect the effects of our social life in creating this culture while using mobile applications and the existence of this mobile application culture. In this study, Partial Least Squares (PLS) and Structural Equation Modeling (SEM) were analyzed using SmartPLS version 3.0. The structure was established with the determining factors, but the hypotheses of Brand Awareness (AW) and Use Habit (UH) factors were not studied while other factors were working. New studies and reasons are explained.

**Keywords:** Social impact, mobil application, usage culture, SEM, e-pulse

**Özet**

Mobil uygulamalar kullanımı gün geçtikçe sosyal hayatın her alanını kapsamaktadır. Dolayısıyla Mobil uygulama kültüründen bahsetmek oldukça anlamlı hale gelmiştir. Sosyal yaşamımızda ki etkilerin bu kültürü oluşturmada etkilerini mobil uygulamaları kullanırken hangi faktörler etkilediği ve bu mobil uygulama kültürünün varlığı araştırmanın konusunu oluşturmaktadır. Çalışmada Kısmi En Küçük Kareler (PLS) ve Yapısal Eşitlik Modellemesi (SEM) SmartPLS sürüm 3.0 kullanılarak araştırma analizleri yapılmıştır. Belirlenen faktörler ile yapı kurulmuş ancak diğer faktörler çalışırken Brand Awareness (AW) ve Use Habit (UH) faktörlerinin hipotezleri çalışmamıştır. Konuyla ilgili yeni çalışmalar ve gerekçeler açıklanmıştır.

**Anahtar Kelimeler:** Sosyal etki, mobil uygulama, kullanım kültürü, SEM, e-nabız

<sup>1</sup> Aydın Adnan Menderes University, osebeci@adu.edu.tr

**RESS Journal**

**Route Educational & Social Science Journal**

Volume 7/Issue 3, March 2020 p. 716-730

## **1. Introduction**

Mobile devices are becoming increasingly common with new hardware resources and expanded computing and storage capabilities (Lee, Lee, Lee, & Kang, 2019). Mobile applications are software programs that can be used after downloading to a mobile phone or tablet (Şat & Sözbir, 2018). These mobile applications are becoming increasingly used in healthcare as in many other areas (Krebs & Duncan, 2015). One way to determine whether a technology is successful is to examine how much of the technology is used (Mason & Mitroff, 1973). From this frame rate of Internet usage in Turkey is 96.8%, while 66.8% of people have smart phones. In addition, more than half of the people in Turkey (65%) use the internet and mobile applications to get health information (Turkey Statistical Institute Newsletter, 2017).

Advances in mobile technology are seen as increasing solutions to expand the scope of healthcare delivery options. Thanks to electronic health systems, flexible access to health information is provided (Griskewicz, 2002) (Eysenbach & Diepgen, 2001). Accordingly, personal health systems are an ever-evolving area that makes it easier for patients to follow their own situation and make informed decisions (Genitsaridi, Kondylakis, & Koumakis, 2015). The primary objective of a personal health registration system is; is to provide the patient with the ability to systematically collect, maintain and manage their personal health record of information about an individual's health and health services stored electronically (Tang, Ash, Bates, & Overhage, 2006), (Genitsaridi, Kondylakis, & Koumakis, 2015).

Today, there is little information about patients' interest in using their mobile devices to download and run patient options or health monitoring applications for mobile application use (Torous, Staples, & Onnela, 2015), (Becker, 2004). However, it is not known how successful and functional the health practices are. Turkey also enacted in 2015. Personal Health System (E-pulse) is being used and how the mobile application value to research where the individuals are in what is considered to be a matter of satisfaction. Despite the growing culture of using mobile apps at a rising rate in Turkey used mobile applications, how it is used by individuals to individuals is not known how useful their daily lives. One of the objectives of this research is; the aim of this study is to investigate the effect of social impact factor on mobile application culture through usage habit, usage benefit, ease of use and brand awareness. Second, the use of mobile applications cultures of Turkey's Personal Health System (E-pulse) application is to develop a model to investigate the effect of use. This model is thought to be used on other mobile applications.

## **2. Literature**

In recent years, among mobile phone users, applications have increased greatly due to the development of services provided by the phone application. When the social interaction of consumers increases, purchasing behavior is positively affected (Alalwan et al., 2017) (Arora et al., 2019). Marketers should use social media and mobile messaging tools to attract users' attention (Tseng & Wei, 2020). This situation; customer satisfaction, habit of use, ease of use and loyalty gained through factors that affect the culture of use emerges as (Alzahrani et al., 2017). This culture of use with mobile applications has been recognized as an effective factor in using applications (Weng et al., 2017).

Mobile applications are gaining importance day by day. Recent developments in mobile applications have had to focus largely on the use of mobile technologies to improve companies' marketing capabilities. Recent studies are mainly aimed at the adoption of mobile applications (Tseng & Wei, 2020). People who are satisfied with their experience in mobile applications are more motivated to continue using such applications, which creates a culture of mobile applications (Alalwan, 2020). The resulting mobile application culture has also been tested in this model to be directly effective for use and details of the literature are given in Chapter 3.

### 3. Research Model and Hypotheses

As it has been throughout history, the level of culture related to a subject has a direct impact on its implementation. It is seen that a culture is formed in the mobile applications subject to our article and the concept of using mobile application culture is important among individuals. Therefore, the factors that will affect the culture of using mobile applications were investigated in our research. Literature review on the subject and in consultation with the experts in the subject; stated that ease of use (EU), awareness (AW), usage benefit (PU), usage habit (UH), social impact (SI) and usage (U) factors may affect the culture of mobile application usage. While creating our model based on literature and field experts; They stated that EU, AW, PU and UH factors would directly affect the culture of mobile application use and the social impact (SI) factor could affect EU, AW, PU and UH factors. Finally, it has been determined that the culture of using mobile applications may affect the use (U) factor. By taking these views into consideration, the model in Figure 1 was created.

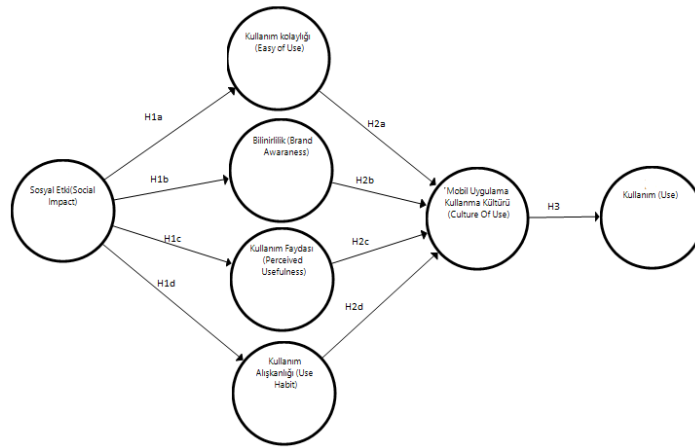


Figure 1. From Social Impact to Mobile Use Culture

#### 3.1 Social Impact and Ease of Use

Social impact is the degree to which an individual believes that others should use the new system (Venkatesh et al., 2003). Perceived ease of use is the degree to which one believes that using a system will be free of physical and mental efforts

(Davis, 1989). Based on these definitions, it is thought that it can affect the ease of use with the information perceived from the individual environment. These studies reveal the following hypothesis.

**H1a: Social impact has a significant positive effect on ease of use.**

### ***3.2 Social Impact and Awareness***

Social influence (Venkatesh et al., 2003), as mentioned in the influence of others under the influence of believing in the same ideas, the recognition (Pappu, Quester, & Cooksey, 2005) is defined as "the power of a brand's presence in the minds of consumers". We have created the following hypothesis after our discussions with experts in the field.

**H1b: Social impact has a significant positive effect on awareness.**

### ***3.3 Social Impact and Use Benefit***

Perceived benefit is a structure that attracts great attention by researchers in many fields (Figl & Derntl, 2011) (Khayati & Zouaoui, 2013). The intentions of people have a strong influence on the use of systems. (Osubor & Chiemeke, 2015). Perceived benefit is quite subjective due to individual prejudices (Izuagbe, et al. 2016), the factors that determine the perceived benefits of innovations from individual perspectives are detailed in the literature. However, there has been little interest in the case from an institutional context. As a result, the authors tested a mixed framework that includes efficiency as well as relative advantage in order to examine perceived benefits from an organizational perspective.

**H1c: Social impact has a significant positive impact on utility benefit.**

### ***3.4 Social Impact and Habit of Use***

Social impact is the degree to which an individual believes that others should use the new system (Venkatesh, et al. 2003). Habits are learned through repetition (Lally, Van Jaarsveld, Potts, & Wardle, 2010). We thought that the social impact of our conversations with the experts in the subject could directly affect the habit and then we created the following hypothesis.

H1d: The social impact has a significant positive effect on the habit of use.

### ***3.5 Ease of Use and Culture of Mobile Application Usage***

Perceived ease of use is the degree to which one believes that using a system will be free of physical and mental "efforts" (Davis, 1989). Together with this definition, we believe that the individual's mobile application culture may affect the ease of applications. Accordingly, the following hypothesis was established.

**H2a: Ease of use has a significant positive impact on the use of mobile applications.**

### ***3.6 Awareness and Culture of Using Mobile Applications***

Awareness (Pappu, Quester, & Cooksey, 2005) describes it as "the power of a brand's presence in consumers' "minds". According to this definition, another thought that will affect the use of mobile applications is considered as awareness. In our opinion, the following hypothesis was established.

**H2b: Awareness has a significant positive impact on the use of mobile applications.**

### ***3.7 Usage benefit and culture of mobile application usage***

Perceived benefit has a strong influence on people's intentions to use a system (Osubor & Chiemekwe, 2015). We think that the use of benefit may affect the use of mobile applications if it has great use in humans. Therefore, we have established the following hypothesis.

**H2c: The utility has a significant positive impact on the use of the mobile application.**

### ***3.8 Habit of use and culture of mobile application***

Habits are learned through repetition (Lally, Van Jaarsveld, Potts, & Wardle, 2010). If an individual is constantly using an object or substance, it becomes a habit in the individual and we thought that this could be the same in mobile applications. Therefore, we have established the following hypothesis.

**H2d: The habit of use has a significant positive effect on the culture of using mobile applications.**

### ***3.9 Culture and General Use of Mobile Application***

The concept of culture refers to the collective patterns and dynamics that are exhibited in the practice of expertise and change in different practice environments (Knorr - Cetina, 1999). Therefore, the following hypothesis can be established since it cannot be ignored that culture affects the use.

**H3: Culture of mobile application use has a significant positive effect on general use.**

## **4. Methodology**

This study is a research project, which includes individuals on the shores of the Aegean region of Turkey. The questionnaires were administered to individuals who knew about the e-pulse application. The proposed model was tested with a quantitative approach. This section provides detailed information on factors, data collection and analysis procedures.

### ***4.1. Measurement of Structures***

In each structure, previously developed scales were used and adapted to the study. Appendix A presents the factor structures, definitions, items and resources used in this study. Five-point Likert scale was used in the study. Although many factors affecting the use of mobile applications are not in the research model, they are inclusive as control factors. Gender, age, edu level and weekly computer use constitute control variables.

### ***4.2 Data***

The survey were completed by face to face interview with 400 people suitable for the sample. Incomplete or ineligible ones were removed from the surveys applied to the sampling (58), a total of 342 valid surveys remained. Demographic information of the participants is examined in Table-1. Approximately half of the participants are male (54.4%). Most of the participants were between the ages of

18-24 (52.3%). Nearly half of the respondents were educated (47.1%). Most of the respondents (29.5%) had a computer usage time between 0-5 hours.

Table 1. Profiles of respondents.

Item	Variable	Frequency	Percent
Gen.	M.	186	54,4
	F.	156	45,6
Ag.	18-24	179	52,3
	25-31	47	13,7
	33-38	43	12,6
	39-45	35	10,2
	46 above	38	11,1
	Education	High Sc.	62
	Com. Coll.	96	28,1
	College	161	47,1
	Mas. Deg.	20	5,8
	Doc.	3	,9
Weekly Computer Use (Hour)	0-5	101	29,5
	6-10	90	26,3
	11-20	82	24,0
	21 and above	69	20,2

**5. Data analysis and results**

Partial Least Squares (PLS) and Structural Equation Modeling (SEM) were used to examine the research models developed for this study. SmartPLS version 3.0 (Ringle, Wende, & Becker, 2015) was used to analyze our research. After descriptive analyses were performed, a two-stage analytic approach (Anderson & Gerbing, 1988) (Hair, et al. 2017) was applied, which included evaluations of existing measurement models and evaluations of existing structural models.

### 5.1. Measurement Model

The mean variance (AVE) of inner consistency reliability, singular indicator reliability and compound reliability, Cronbach alpha value and convergent validity were evaluated to assess the population for the analysis of RMMs. In addition, the HTMT were used to test discriminatory validity.

Table number 2 below shows the outcomes of the con. validity of the estimate model. On Account of the equality analysis of the items, the indicator factor loads and the population should be higher than 0.7 and 0.5, respectively (Hair, et al. 2010). When we look at our factor loadings, it shows that all loads except "U4" value exceed 0.7 level. Cronbach's alpha, composite reliability, and AVE values should be higher than 0.7, 0.5 respectively (Wong, 2013) (Nunnally, 1994) (Hair, et al. 2010). When we look at the table, it shows that the values exceed the levels and this convergent validity is met. Finally, F-L analysis indicate that the square root of AVEs of each factor is greater than correlations with other factors (Table 3) (Fornell & Larcker, 1981). Thus, the distinctive validity of all structures was achieved. Similarly, if all HTMT values were less than 0.90, discriminant validity was achieved between the two reflective structures (Henseler & Sarstedt, 2015) (Table 4). Consequently, both convergent and distinctive validity were met, indicating that we can continue to evaluate the structural model.

Table 2. The outcome of the measurement model: convergent validity

Const.	Indicators	It. Loading	It. Communality	Cr.'s Alpha	Com. Reliability	AVE
Brand	AW1	0,772		0,741	0,852	0,658
Awaranness	AW2	0,834				
	AW3	0,826				
Culture Of Use	CU1	0,878		0,902	0,927	0,719
	CU2	0,874				
	CU3	0,876				
	CU4	0,834				
	CU5	0,772				
Ease Of Use	EU1	0,848		0,745	0,854	0,662
	EU2	0,856				
	EU3	0,732				
Perceived Usefulness	PU1	0,877		0,758	0,860	0,673
	PU2	0,807				
	PU3	0,772				
Social Impact	SI1	0,812		0,789	0,862	0,610
	SI2	0,713				
	SI3	0,830				
	SI4	0,763				
Use	U1	0,744		0,737	0,834	0,558
	U2	0,773				
	U3	0,776				
	U4	0,690				
Use Habit	UH1	0,870		0,797	0,881	0,713
	UH2	0,795				
	UH3	0,865				



Table3: Fornell-Larcker Criterion

	Brand Awareness	Culture Of Use	Ease Of Use	Perceived Usefulness	Social Impact	Use	Use Habit
Brand Awareness	<b>0,811</b>						
Culture Of Use	0,213	<b>0,848</b>					
Ease Of Use	0,516	0,328	<b>0,814</b>				
Perceived Usefulness	0,448	0,323	0,636	<b>0,820</b>			
Social Impact	0,271	-0,046	0,211	0,279	<b>0,781</b>		
Use	0,332	0,265	0,457	0,496	0,379	<b>0,747</b>	
Use Habit	0,350	0,176	0,416	0,377	0,290	0,377	<b>0,844</b>

Table4:Heterotrait-Monotrait Ratio (HTMT)

	Brand Awareness	Culture Of Use	Ease Of Use	Perceived Usefulness	Social Impact	Use	Use Habit
Brand Awareness							
Culture Of Use	<b>0,247</b>						
Ease Of Use	<b>0,674</b>	<b>0,397</b>					
Perceived Usefulness	<b>0,590</b>	<b>0,375</b>	<b>0,825</b>				
Social Impact	<b>0,345</b>	<b>0,088</b>	<b>0,250</b>	<b>0,340</b>			
Use	<b>0,440</b>	<b>0,313</b>	<b>0,605</b>	<b>0,639</b>	<b>0,468</b>		
Use Habit	<b>0,455</b>	<b>0,211</b>	<b>0,535</b>	<b>0,497</b>	<b>0,355</b>	<b>0,481</b>	

**5.2. Structural assessment**

The secondary part of the PLS offers the results of the SM and the notional significance of each independent variable (Gefen & Straub, 2005). We estimated the structural model using SPLS 3.0 (Ringle, et al. 2015) analysis. In the PLSSEM touch, the preload test evaluates the importance grade by assigning-statistics, path parameter ( $\beta$ ) and error level possibility (p-value) for each route in the SM (Hair, et al. 2013) (Sars, et al. 2017). We used 5000 samples in the bootstrapping process to evaluate the significance and amount of variance of hypothesized routs independent variables attributed to revealing variables (Gefen, et al., 2011).

Table 5. Route parameters.



Hypothesis	Path Coefficient ( $\beta$ )	T Statistics	P Value	Decision
H1a Social Impact -> Ease Of Use	0,211	3,518	0,000	Accepted
H1b Social Impact -> Brand Awaranness	0,271	4,680	0,000	Accepted
H1c Social Impact -> Perceived Usefulness	0,279	5,009	0,000	Accepted
H1d Social Impact -> Use Habit	0,290	4,831	0,000	Accepted
H2a Ease Of Use -> Culture Of Use	0,190	2,135	0,033	Accepted
H2b Brand Awaranness -> Culture Of Use	0,026	0,367	0,713	Not accepted
H2c Perceived Usefulness -> Culture Of Use	0,184	2,437	0,015	Accepted
H2d Use Habit -> Culture Of Use	0,018	0,221	0,825	Not accepted
H3 Culture Of Use -> Use	0,265	4,499	0,000	Accepted

Our review of the outcomes handling PLSSEM lead off us to openly confirm the primary suppositions for this work. Following scanning and clearing data for potency read errors and overdistribution of some replies, we were able to evaluate the SM of the PLSSEM to test hypotheses. (Urbach & Ahlemann, 2010) according to the strong and significant value of hypotheses should be at least 0.05. The test outcomes were cantilevered by the nature of the effect (+ or -) and force. The H1a hypothesis looked at the positive effect of social impact on the ease of use and was supported ( $\beta = 0.211$ ,  $p < .001$ ). The H1b hypothesis looked at the positive effect of social impact on awareness and was supported ( $\beta = 0.271$ ,  $p < .001$ ). The H1c hypothesis looked at the positive effect of social impact on utility benefit and was cantilevered ( $\beta = 0.279$ ,  $p < .001$ ). The H1d hypothesis looked at the positive effect of social impact on the habit of use and was cantilevered ( $\beta = 0.290$ ,  $p < .001$ ). The H2a hypothesis takes a look at the positive impact on the ease of use on the culture of mobile application use and was cantilevered ( $\beta = 0.190$ ,  $p < .05$ ). The H2b hypothesis looked at the positive effect of awareness on mobile application use culture and was not supported ( $\beta = 0.026$ ,  $p > .05$ ). The H2c hypothesis looked

at the positive effect of using benefit on mobile application usage culture and was cantilevered ( $\beta = 0.184$ ,  $p < .05$ ). The H2d hypothesis looked at the positive effect of habit on mobile application use culture and was not supported ( $\beta = 0.018$ ,  $p > .05$ ). The H3 hypothesis looked and supported the positive effect of mobile application use culture on use ( $\beta = 0.265$ ,  $p < .001$ ). From these results, it has been proved that the factors of Ease of Use, Perceived Usefulness of individuals living in Aydın and Nazilli sages will directly affect the culture of mobile application usage and indirectly affect EU, AW, PU, UH factors in the social content (SI) factor. Finally, the culture of using mobile applications has been proven to affect the use factor. But it was concluded that Brand Awareness, Use Habit factors do not affect Mobile Application Usage Culture.

## **6. Discussion, Conclusion and Suggestions**

The main purpose of this study is how the culture of mobile applications in Turkey is to show that by finding a common path to the future application developer. For this, we modeled the relationship between the factors affecting my mobile application usage cultures of individuals in their respective regions. Based on the surveys we conducted and the statistical analysis findings of these surveys, it was determined that the factors of Ease of Use, Perceived Usefulness, Social Impact (SI) had a positive and significant effect on the culture of mobile application use. Specifically, the complex effects of social impact, individual characteristics, and personal innovation on multidimensional trust beliefs such as integrity, goodness, and talent have not been tested in previous studies (Hwang, 2009). The high perceived benefit and ease of use and the results of the introduction of the mobile application are seen in many studies. The interests of users were found to be consistent during the use of applications (Scheper, et al., 2019).

On the other hand, Brand Awareness (AW) and Use Habit (UH) did not affect mobile application usage culture. This situation does not coincide with other studies. The grounds are also not formed yet of brand awareness in mobile applications can düşününül in Turkey. It may be suggested that this issue should be examined carefully by academic application developers. It can be explained that the dissemination of the regional study, which is the limitation of our study within the usage habit factor, may clarify the results. Because it is an indisputable fact that habit forms a culture. Finally, it is seen that mobile application usage culture has a positive and significant effect on General Use.

The mobile application culture researched in our study should be considered as an important step for mobile application developers in the future. This study can guide developers to consider what they need to pay attention to in their implementation, and how to follow it. Our study can be used in many areas that can make life easier for individuals. Representative; website designs, mobile applications, computer automation and so on. Areas can be used to show the way for developers. Determining the culture of using mobile applications is important for a developer to know how to better use the project.

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