

The Smartphone Technology Acceptance among Emarati Senior Adults

Firas Habbal, PHD

*Assistant Professor - Al Ain University of Science & Technology
Management & MIS department, Abu Dhabi - United Arab Emirates.*

Orcid: 0000-0003-3127-0751

Abstract

Smart phones became a need for all ages, and nowadays smart technology plays a key role in inhibiting new technologies to be used for business tasking, the convenience usage of smartphones and the ease of use is an emerging trend among different users, especially for senior adults. To use smart technology for managing personal tasks it became a demand among all users. This paper will focus on senior users between 40 – 60 years old living in UAE as there is no clear answer of how they are actually using it and what are the perceived usefulness they are getting by converting to smart devices to manage their daily lifestyle. Therefore, this paper main aim to use TAM model to capture detailed view among Emirati seniors perceived value and their acceptance to this innovative technology. These paper findings confirmed that there is a huge difference between the acceptance of young adults and senior adults toward smart devices in UAE and confirm that those usefulness and smartphone technology can be denied or rejected by seniors adults for many reasons, although it can influence them to accept the smart technology in future.

Keywords: Smartphone technology, Technology acceptance model, senior adults, perceived usefulness, Technology Acceptance Model.

INTRODUCTION

Smart phones technology has caused an evolution in daily tasks processing in very short time which made all users became addicted to their phones and the new smart platforms to fulfill their need. It has been used by almost all sectors nowadays such as education, government, health and financial services which it has proved that it enhances the personal experience for the daily tasking [1]. Researchers has found that the reason for making all type of users accepts this innovative technology because it replaces the normal computers and can do all tasks that normal computers do in simpler ways and easier to adopt, in addition to its high storage and capacity to complete unlimited personal tasks at same time beside it contains high speed processors, HD cameras, gaming and task management application and other applications which can be considered as a gold mine for smart technology adopters [2].

The adoption of smart technology among your adults is growing globally it can be found statistically in many papers

studying the smart technology adoption and acceptance. In this paper will focus on users located in United Arab of Emirates, study done by eMarketer magazine 2018 had found a nearly 73% of the population of the United Arab Emirates (UAE) are using a mobile phone, eMarketer estimates. This puts the UAE in the No. 1 spot for mobile phone user penetration among countries in the Middle East and Africa (MEA). Penetration will rise slightly throughout forecast period, nearing three-quarters in 2018, and will remain the highest during that time period [3]. Smart phones have completely dominated the market over normal phones because of its unique features and smart enhancement that read and understand personal needs and provide better solution [4]. However normal basic mobile phones its limited to basic features which can only suite specific needs and limited to its basic platforms. In the contemporary smart phones can transform into navigators, translators, personal guidance, and many more which helps the user to transform to smart user too [5]. Nowadays marketers are seeing smartphones are not a want anymore they are a need and necessity that makes users completely depend on their smartphones and have they urge to continue using those devices as a demand of life continuity and became part of the everyday life [6].

To build a framework of this study used The (TAM) Technology Acceptance Model built by Davis (1986) [7]. (TAM) is a well known theory and it has been used by many authors to study users' adoption behavior towards technology [8]. (TAM) contains 4 different variables as follows: Perceived ease of use (PEU), Perceived usefulness (PU), Attitude (A), and Behavioral intentions (BI). In this paper we will use those variables to discuss and investigate smart phones technology acceptance among Emirati senior adults. This paper will focus on this segment as research has found that they are the controlling segment of Emirati economy [9] and their adoption to this technology is at the minimum level comparing to young adults, also their acceptance to the new innovative technology will never depend on lifestyle they are always striving to find easier and better solutions to get their daily tasks done in faster yet simpler ways. In reference to this study, (PU) defines the scope of user job performance. Meanwhile (PEU) is defining the degree to which users believes that smartphones usage would be effort free, and (BI) defines both positive and negative emotions that Emirati senior adults feels towards smartphones usage, and (A) will define the attitude changes of Emirati users while using smartphones.

LITERATURE REVIEW

(TAM) model was built by Fred Davis on 1989 [7] which it was an expansion from (TRA) Theory reasoned Action which introduced 2 new variables the perceived ease of use and perceived usefulness, Davis used this model to analyze the user's acceptance toward technology [10]. Technology Acceptance Model (TAM) was used by many researchers in different fields who used it to determine the acceptance of technology application in specific task [12]. In addition, TAM is an influential model that has been used by many scholars to evaluate users' behavior and acceptance towards technology. (PEU) and (PU) are the most important influencer which can be deployed among different variables [2].

Many papers were made and built based on (TAM) model. Wang analyze the relation between the adoption of mobile learning and user's behavior as well as the outcome of the study conveyed level of users' usage with smartphones which will influence their perception and usefulness of mobile usage [13]. Another study made by Kim [15] made to analyze the difference between male internet users and female users and the paper concluded that PEU affects female users more than male users. Smartphones have many essential features such as high speed processing which is used to provide high speed connection to internet through (Wi Fi) also large size screens caused an increase of smartphones usefulness and the adoption among young users [15]. While [16] stated that technology users believe that the main purpose of using smart technology is play games, music, and internet surfing which has a dramatic increase over the PU of smartphones users.

On the other hand, [17] stated that social effects has a direct influence over individuals behaviors and indirect affect over individuals behavior usage of specific technology. Researches have proven that different attitude will show among different users while using online smart business which can be called also mobile commerce [18]. After discovering this innovative technology which called smart phones the access of social pages and personal networking sites became limitless, thus the addiction to use those social blogging sites increased dramatically among all users seniors and adults [19]. [20] emphasized that users will heavily depend on smartphones to determine their future purchase and buying behavior. Also, [21] said it is important to create features that can merge mobile values and behaviors of users to achieve consumers' satisfaction.

RESEARCH METHODOLOGY

This study will examine the acceptance of smartphones technology using (TAM) model among senior adults in United Arab of Emirates. The sample includes senior adults between 40 – 50 years old with different educational background and position, none of them are technology specialists or have worked before in IT field. This sample was selected to analyze the 4 factors of (TAM) model; PU, PEU, A, BI affects. In this

paper the PU, PEU, and A are the independent variable and BI is the dependent variables. This sample was selected because senior adults in UAE are mostly forced to use smartphones, as UAE government vision to fully convert to be smart government by 2021 and nowadays more than 73% of governmental and business tasks are being processed using smart applications. The UAE mGovernment initiative is in line with Vision 2021 that foresees high quality of life built on world-class public infrastructure, government services and a rich recreational environment. Sheikh Mohammed bin Rashid Al Maktoum Vice President, Prime Minister, Ruler of Dubai set a period of two years for the UAE government to complete the implementation of offering services through the mobile phones [14]. Moreover, this sample has the most powerful affects over UAE market and they control most of the executive positions in UAE and considered as the real decision making power in both governmental and public sectors.

In this paper all results were found using a questionnaire which been developed to analyze the results from the selected sample which includes their interest, intention, and perception towards smartphones. This study included five points Likert-Scale survey and more than 600 surveys were distributed 457 were valid and used for this study. Using the smart statistical software SPSS 19.0 the results calculates the frequencies', means, percentage and the reliability of all factors analysis.

This paper applied random sampling methodology to help understand the samples' characteristics. Non response bias test was used between responses to compare mean score between PU, PEU, A, and BI to ensure the data is non response bias free.

FINDINGS

Respondent profile

Table 1: Summary of Respondents

Items (Variable)	Frequency Total= 457	Percentage (%)
Gender	Male	350
	Female	107
	Total	457

The paper used only 457 responses out of 600 which has been identified as valid responses based on the data analysis process. Data demographic indicates that majority of respondents are Male 76.6% while there the female respondents were (23.4%). All respondents were over 40 years old

Table 2: Summary of usage

Items (Variable)		Frequency	Percentage
		Total= 457	(%)
Period of using smartphone	Less than a Year	53	11.6
	1 year to 3 years	342	74.8
	More than 3 years	62	13.6
Total		457	100

As seen on Table 2 majority of users were using smartphones within 1 to 3 years (74.8%) from the total respondents, while (11.6%) used smartphones less than a year, and finally (13.6%) adopted smartphones technology usage since more than 3 years.

Table 3: Non-response bias

Variable	Early response rate		Late response rate		t-value
	Mean	SD	Mean	SD	
PEU	1.74	0.40	1.77	0.48	-0.637
PU	4.09	0.48	3.85	0.57	4.474
A	2.82	1.03	2.96	1.16	0.69
BI	4.34	0.43	4.19	0.50	3.300

Independent t-test was applied to evaluate the mean score between early and late respondents. Low response rate will be affected during the validity analysis. [24] suggested that the total response rate was bigger than the minimum response rate recommended. Those results of non response bias indicates that the variance value of early and late respondents was identical. As a result, analyzing each group separately is not required

Factor Analysis and Reliability Analysis

The paper conducted factor analysis to reduce wide range variable number [24]. On the other hand, [25] stated that factor analysis is used by many scholars to evaluate the construct adequacy of device measuring. The collected data led to Confirmatory Factor Analysis (CFA) process to evaluate the internal consistency of the data measurement model. 7 items were omitted from PEU and 2 items from BI during the (CFA) process which have the communality value below 0.50 and cross loaded more than one module. However, no variable was deleted from PU or A during the analysis as the communality value of all modules was above 0,5.

Table 4: Factor analysis for independent variables

Code	Item	Loading
Perceived usefulness		
PU1	Using smartphone technology improves the quality of the work I do.	.636
PU2	Using Smartphone technology gives me greater control over my work.	.656
PU3	Smartphone technology enables me to accomplish tasks more quickly.	.693
PU3	Smartphone Technology supports critical aspects of my job.	.713
PU4	Using Smartphone technology increases my productivity.	.771
PU5	Using Smartphone technology improves my job performance.	.777
PU6	Using smartphone technology allows me to accomplish more work than would otherwise be possible.	.724

PU7	Using smartphone technology allows me to accomplish more work than would otherwise be possible.	.755
PU8	Using smartphone technology enhances my effectiveness on the job.	.745
PU9	Using Smartphone technology makes it easier to do my job.	.649
PU10	Overall, I find the Smartphone technology is Useful in my job.	.636

Eigenvalue: 2.849

Variance: 49.716

Reliability: .908

Perceived Ease of use

PEU1	I find Smartphone technology is complicated to use.	.747
PEU3	Interacting with the smartphone technology is often frustrating.	.670
PEU6	Interacting with smartphone technology requires a lot of mental effort.	.719

Eigenvalue: 1.527

Variance: 56.356

Reliability: .537

Attitude

A1	Working using smartphones is a good idea.	.954
A2	Working using smartphones is a wise idea.	.935
A3	I think positively toward using smartphone technology.	.864

Eigenvalue: 6.542

Variance: 66.395

Reliability: .948

Table 4 indicates the factor analysis result for the first independent variable PU indicates the communalities variance of 49.7 percent with Eigen value of 2.849 which is above minimum value suggested by [24]. Besides the second independent variable PEU was explained as 56.3 percent with Eigen value of 1.527. And the A was explained 66.3 percent and the eigenvalue value is 6.542. As expected the result of loading value for A was above 0.6 [24]. As expected, all loading value for this research is above 0.5.

Table 5: Factor analysis for dependent variable

Behavioral Intention		
BI 1	I like using smartphone technology.	.745
BI 2	I feel good about using smartphone technology.	.721
BI 3	I think positively toward using smartphone technology.	.725
BI 4	I intended to use smartphone technology.	.729
BI 5	I predict that I would use smartphone technology.	.752
BI 6	I plan to use smartphone technology.	.782
BI 7	I intend to be a heavy user of smartphone technology.	.660
BI 8	I intend to use smartphone technology in near future.	.758
BI 9	I am willing to use smartphone technology.	.770
BI 10	I will use smartphone technology in regular basis in near future.	.691

Eigen value: 8.828

Variance: 36.785

Reliability: .917

Table 5 indicates the summary of factor analysis for dependent variables BI of smartphone technology acceptance. The BI was explained 36.7 percent variance through varimax rotation and the eigenvalue value is 8.828. As expected the result of loading value for BI was above 0.6 [24].

The reliability statistic (Cronbach's alpha) of PU, PEU, A and BI indicates that all variables are ranging from 0.537 to 0.948 which above the minimum Cronbach's alpha value (0.5) suggested by [25] and

[27]. The Cronbach's α was used to examine the reliability of each construct variables [24]. Thus this study assumes that all variables are sufficient enough to conduct further analysis.

Hierarchical Regression analysis

Table 6: Hierarchical Regression analysis test between Perceived Ease of Use (PEU) and Behavioral Intention (BI)

Mediating variable	R Square (R2)	Beta	F	Sig.
PEU	.031	-.177	13.749	.000
BI				

From table 6 the regression summary indicates that bivariate correlation between independent variable (PEU) and dependent variable (BI) is 3.1%. this means that PEU is an important factor for measuring smartphones acceptance but plays less role in term of mediating toward BI. Beta value is (-.177) which confirms the relation between (PEU) and (BI). Furthermore, the relation between PEU and BI is significant which is less than 0.5.

Table 7: Hierarchical Regression analysis test between Perceived of Usefulness (PU) and Behavioral Intention (BI)

Mediating variable	R Square (R2)	Beta	F	Sig.
PU	.017	-.129	7.174	.007
BI				

From table 7 the regression summary indicates that bivariate correlation between independent variable (PU) and dependent variable (BI) is 1.7%. this means that PU is less important factor for measuring smartphones acceptance but plays important role in term of mediating toward BI. Beta value is (-.129) which confirms the relation between (PU) and (BI). Furthermore, the relation between PU and BI is significant which is less than 0.5.

Table 8: Hierarchical Regression analysis test between Attitude (A) and Behavioral Intention (BI)

Mediating variable	R Square (R2)	Beta	F	Sig.
A	.054	-.183	14.746	.000
BI				

From table 8 the regression summary indicates that bivariate correlation between independent variable (A) and dependent variable (BI) is 5.4%. this means that A is most important factor for measuring smartphones acceptance and plays very important role in term of mediating toward BI. Beta value is (-.183) which confirms the relation between (PU) and (BI). Furthermore, the relation between PU and A is significant which is less than 0.5.

Table 9: Model summary of perceived ease of use, Perceived usefulness, Attitude and Behavioral intention.

Mediating variable	R Square (R2)	Beta	F	Sig.
PEU	.261	-.115	74.981	.000
PU				.007
A				.000
BI				.000

The result of R2 value is 0.261, which explains 26.1 percent of variance in PU, A and BI which is statistically significant with F= 74.981. In addition, PEU, A and BI have the same significant value which is $p < .000$ while PU was $p < .007$. The beta value -.115 and this indicates that mediation relationship with BI. The strength of independent variable (PEU) to predict independent variable (BI) and mediating variable of (PU) and (A) during regression test is indicating that there is a partial correlation among the variables. There is no multi-co linearity problems were found in this study.

CONCLUSION

This paper is an assessment study about the business usage of smartphones technology among senior Emirati adults. The assumption indicates that senior Emirati adults are aware about smart phones technology and they are willing to use it for their business use, and their only concern will be the device price. This follows [29];[1] findings as the agreed that smart phones is important tool for most of business users. And the majority of senior adults are using smartphones within the last 3 years and they have noticed a significant improvement in their daily business tasking. In addition, the simplicity of this innovative technology empowers the users to process more tasks effectively and more efficiently which confirms their PU and increase in their A. Furthermore, senior adults are more attracted to use smart phones technology for their business tasking than using other technologies for its simplicity and availability. The UAE government plays the most important role in forcing and empowering smart phones for the business use and always encourages users to have strong desire to engage with smart phones technology.

REFERENCES

- [1] Kirwan, M., Duncan, M. J., Vandelanotte, C., & Mummery, W. K. (2012). Using smartphone technology to monitor physical activity in the 10,000 Steps Program: a matched case-control trial. *Journal of medical Internet research, 14*(2).
- [2] Cho, H., & Park, B. (2013). Testing the moderating role of need for cognition in smartphone adoption. *Behaviour & Information Technology, 1-12*. doi: 10.1080/0144929x.2013.825643
- [3] eMarketer Magazine “United Arab of Emirates Leads Middle East and Africa in mobile phones penetration” 2018, <https://www.emarketer.com/Article/United-Arab-Emirates-Leads-Middle-East-Africa-Mobile-Phone-Penetration/1011971>
- [4] Mallat, N., Rossi, M., Kristina, V., Öörni, A., 2009. The impact of use context on mobile services acceptance. *Information & Management, 46*(3), 190-195.
- [5] Böhmer, M., & Krüger, A. (2013). *A study on icon arrangement by smartphone users*. Paper presented at the Proceedings of the SIGCHI Conference on Human Factors in Computing Systems.
- [6] Tian, L., Shi, J., and Yang, Z. . (2009). Why does half the world’s population have a mobile phone? An examination of consumers’ attitudes toward mobile phones. . *Journal of psychology, 12*(5), 513-516. doi: 10.1089/cpb.2008.0335
- [7] Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly, 3*19-340.
- [8] M Aboelmaged, T gebba. (2013). Mobile Banking adoption: An examination of technology acceptance model and theory planned behavior. *International Journal of Business Research and Development, 2*(1), 35-50.
- [9] Ministry of Economy (2016) “Annual Economic Report 2016”. 24th Edition <http://www.economy.gov.ae/Publications/MOE%20Annual%20Repoert%20English%202016.pdf>
- [10] Pavlou, P. A. (2003). Consumer acceptance of electronic commerce: integrating trust and risk with the technology acceptance model. *International journal of electronic commerce, 7*(3), 101-134.
- [11] Ramayah, T., Ahmad, N. H., Chin, L. G., & Lo, M. (2009). Testing a causal model of internet piracy behavior among university students. *European Journal of Scientific Research, 29*(2), 206-214.
- [12] Stern, B. B., Royne, M. B., Stafford, T. F., & Bienstock, C. C. (2008). Consumer acceptance of

- online auctions: An extension and revision of the TAM. *Psychology and Marketing*, 25(7), 619-636. doi: 10.1002/mar.20228
- [13] Wang, Y.-S., Wu, M.-C., & Wang, H.-Y. (2009). Investigating the determinants and age and gender differences in the acceptance of mobile learning. *British Journal of Educational Technology*, 40(1), 92-118. doi: 10.1111/j.1467-8535.2007.00809.x
- [14] UAE Government, 2017 "UAE m Government Initiatives 2021" <https://government.ae/en/about-the-uae/the-uae-government/smart-uae/uae-mgovernment-initiative>
- [15] Kim, J. B., & Kang, S. (2012). A Study on the Factors Affecting the Intention to Use Smartphone Banking: The Differences between the Transactions of Account Check and Account Transfer. *International Journal of Multimedia & Ubiquitous Engineering*, 7(3).
- [16] Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information Systems Research*, 14(2), 189-217. doi: 10.1287/isre.14.2.189.16018
- [17] Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*.
- [18] Min, Q., Ji, S., & Qu, G. (2008). Mobile commerce user acceptance study in China: a revised UTAUT model. *Tsinghua Science & Technology*, 13(3), 257-264.
- [19] Kang, I., Shin, M. M., & Park, C. (2013). Internet addiction as a manageable resource: a focus on social network services. *Online Information Review*, 37(1), 28-41
- [20] Kuhlmeier, D., & Knight, G. (2005). Antecedents to internet-based purchasing: a multinational study. *International Marketing Review*, 22(4), 460-473.
- [21] Hamka, F., & Bouwman, W. H. (2012). Smartphone's Customer Segmentation and Targeting: Defining market segment for different type of mobile service.
- [22] Sharma, N., & Patterson, P. G. (2000). Switching costs, alternative attractiveness and experience as moderators of relationship commitment in professional, consumer services. *International Journal of Service Industry Management*, 11(5), 470-490. doi: 10.1108/09564230010360182
- [23] Cavana, R. Y., Delahaye, B. L., & Sekaran, U. (2000). *Applied research: Qualitative and quantitative methods*. Sydney: John Wiley & Sons Inc.
- [24] Armstrong, J. S., & Overton, T. (2005). Estimating Nonresponse Bias in Mail Surveys: EconWPA.
- [25] Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate analysis*. Englewood: Prentice Hall International.
- [26] Cooper., D. R., & Schindler. (2001), *Business Research Methods*: McGraw-Hill International
- [27] Igbaria, M., Iivari, J., & Maragahh, H. (1995). Why do individuals use computer technology? A Finnish case study. *Information & Management*, 29(5), 227-238.
- [28] Baron and Kenny (1986) *Statistical Mediation Analysis in the New Millennium*, Communication Monographs, 76:4, 408-420, DOI:10.1080/03637750903310360
- [29] Reilly, M., & Shen, H. (2011). *The design and implementation of the smartphone-based groupnotes App for ubiquitous and collaborative learning*. Paper presented at the Proceedings of the 6th international conference on Ubiquitous and Collaborative Computing
- [30] Karim, N. S. A., Oyebisi, I. O., & Mahmud, M. (2010). Mobile phone appropriation of students and staff at an institution of higher learning. *Campus-Wide Information Systems*, 27(4), 263-276.
- [31]