



FACTORS INFLUENCING READING NEWS ON THE MOBILE DEVICES IN QATAR IN LIGHT OF AUGMENTED REALITY (AR) & VIRTUAL REALITY (VR)

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ABSTRACT

Purpose: *The purpose of this study is to examine and better understand the factors influencing reading news on the mobile devices in Qatar from the viewpoint of intention to adopt augmented reality (AR) and virtual reality (VR).*

Design/Methodology/Approach: *A large convenience sample of 699 respondents from Qatar was surveyed. The researcher employed KMO measure of sampling adequacy and the Bartlett test of sphericity to establish the construct validity of the instrument using advanced SPSS. The four extracted and rotated dimensions were found to be reliable and valid.*

Main Findings: *Findings from Multiple Regression Analysis have confirmed two out of six hypotheses. Two independent variables (1) nationality and (2) interest in using AR & VR out of six explanatory variables are significant in predicting the use of mobile devices to follow regional and international news in Qatar from the viewpoint of intention to adopt augmented reality (AR) and virtual reality (VR).*

Implications: *Gone are the days when Qataris have to wait to get the traditional printed newspapers. A more proactive approach from decision makers in Qatar's newspaper printing industry is needed to benefit from the findings of this research and the digitalization of international news.*

Novelty: *This article empirically correlates two fields of research: the digital copy of the real world and reading international news.*

Keywords: Augmented reality (AR), Virtual reality (VR), Disruptive innovation, News, Qatar

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1. INTRODUCTION

Augmented reality (AR), virtual reality (VR) and the technology to expose their potential have already reached Qatar. As head of the Digital Society, Ministry of Transport and Communications (MoTC), Her Excellency Reem Al-Mansoori, has been working for more than 18 years to drive Qatar's society towards a bright future. To this end, Alraouf & Alkarrani note that “[T]he urban development of Qatar focused on establishing vibrant neighborhoods, work and play spaces to gain economic and social benefits. Additionally, addressing the technological and sociological challenges faced creating the ideal mixed-use development that would create just urbanism and enhance social interactions” (Alraouf&Alkarrani, 2017; p.1072). According to Mohammed Ali Hammami, head of the Virtual Reality department at Qatar University, virtual reality (VR) system was first introduced in Qatar in April 2014 “ but it was only used only for VIP presentations, or to showcase the technology at a basic level. There were not people around here (in Doha) who had knowledge about what VR can do” (Hammami, 2015).What is more, the terms augmented reality (AR) and virtual reality (VR) have each received a tremendous amount of attention that has seen the growth of several different fields of consideration (Boud et al., 1999). According to Gandolfi (2018), AR and VR can be well thought out as two sides of the same coin in which both aim to improve the sensorial atmosphere of the consumer by interceding reality through technology.

2. REVIEW OF LITERATURE

No doubt at all that Qatar has one of the top news agencies in the Arab world such as Al Jazeera Media Network. For the most part, daily life in Qatar seems very similar to everyday life in any smart digital society in Europe. The Dean of the College of Science and Engineering at Hamad bin Khalifa University in Qatar reports that “The trend toward a smart digital society is being realized with significant advances in key technological enablers and disruptive innovations in a plethora of telecommunications and computing areas”(Hamdi, 2019). The Peninsula reports that “Qatar also came first among all Arab countries and 12th worldwide on the indicator that measures the percentage of individuals using the Internet in 2014 (91.5 percent) followed by Bahrain (91 percent) and UAE (90.4 percent), said the Ministry of Information and Communications Technology (ictQATAR) in a press release”(The Pininsula, 2017). Every day, Qatar is making something new happen at a faster rate. Currently, subjects, objects and infrastructure in Qatar are connected through smart devices and sensors. In the modern newspaper sector, for example, we can witness the evolutions driven by disruptive innovation such as the emergence of augmented and virtual reality in newspapers that take Qatari’s beyond the printed page. The ancestors of a modern newspaper that were born in Europe as handwritten newssheets and were evolved into modern printed newspapers, are currently becoming part of the global museum and gradually being replaced by the augmented and virtual reality that enables readers to see video and animation on the page of their newspaper. With written content, readers have to sit down, focus and read. With video, sound, graphics or GPS data, people can do other tasks while watching the news. Sungkur and his colleagues state that “the proliferation of wireless mobile devices such as smartphones and tablets is also introducing AR into the mobile domain” (Sungkur, and Bhoyroo, 2016; p.123”. This state-of-the-art technologies in newspapers are transforming Qatar Society into modern society and enabling Qatari’s to overcome the geographic limit of their tiny country. Augmented reality and virtual reality have improved the widespread international news and enabled newspaper readers to interact with the news. Cabiria notes that “Augmented reality merges manipulable digital imagery into real-world spaces and in real-time. The technologies used to create augmented environments already exist in the mass

market and have already begun to show up in a wide variety of fields”(Cabiria, 2012; P.225).In her speech at a public lecture for North Western University in Qatar, Mia Tramz, Emmy-winning producer and editorial director of enterprise and immersive experiences at TIME Inc., noted that in her journalistic projects “faces the same rigorous standards for accuracy – even in environments produced fully with computer-generated imagery. Stories that take viewers to the frontlines of Pearl Harbor or on-board a ship fleeing the Nazis all contain objects and information that were gathered through research from archival images, ethnographic museum collections, and first-hand accounts” (Tramz, 2018). She added that VR is not a superior and enhanced cinema – it is an interactive theatre. What is more, she does not see “VR as an emerging alternative to photojournalism or documentary films, but rather as another way to take audiences to new places in ways that might otherwise seem distant or unreachable” (Tramz, 2018). “Thanks to AR, people can watch a video/video animation, or any other unexpected content. Unlike virtual reality (VR), AR offers additional content that is usually interesting, informative and enjoyable. It requires only a smartphone with a mobile app to watch this content ‘come to life’” (Knihová, 2019). In fact “Qatar is one of the Arab states of the Persian Gulf that has witnessed the highest adoption rate of smartphones, exceeding the average adoption rate of smartphones in the other Arab States. The growth of the market can be attributed to increasing adoption of these phones among millennials, high disposable income, and widespread use of broadband connections. Surging use of communication & collaboration applications, gaming applications, and internet surfing is expected further to boost the sales of smartphones in the country” (Grand view research, 2019).

3. STATEMENT OF RESEARCH PROBLEM

Rapid development and improvements in network technology like 5G and Edge Computing are modifying the way people in Qatar feel that they are involved and participating in what they see and hear. People can fast make adoption and enjoy AR and VR at home, but they do not fully understand it. They deal with it as a gaming environment. Sheikh Hamad Abdulla Al-Thani, Vodafone Qatar Chief Executive Officer, has recently said that “[T]he way we enjoy live sports games is about to be transformed by 5G capabilities. By unlocking the full potential of immersive technologies such as VR, the live sporting viewing experience will be truly personalized and interactive. The fan experiences powered by Vodafone Qatar's 5G network at the Gulf Cup are a taste of what is to come at future international tournaments”(MENAFN - The Peninsula, 2019). Bullock notes that “Augmented reality (AR) is already impacting social media – and it's done so for years now. In fact, it seems like AR is taking over the most popular social networks in the world – Facebook, Instagram, Snapchat – and new AR technology is introduced all the time”(Bullock, 2018). The purpose of this study is to examine and better understand the factors influencing reading newspapers on the mobile device in Qatar from the viewpoint of intention to adopt augmented reality (AR) and virtual reality (VR).

3.1. Hypotheses

In 2015, ictQatar reported that “Qataris are more likely to use WhatsApp, Twiter - and even Instagram – to find out about the latest news. Non- Qatari is much more likely to use Facebook” (ictQatari, 2015). Consequently, the first hypothesis to be tested in this study is:

H₁. Nationality (Qatari versus non-Qatari) is significant in predicting the use of mobile devices to follow regional and international news

What is more, Kim and his colleagues believe that “[Y]oung consumers are particularly vulnerable to the addictive nature of smartphone technology” (Kim, Milne and Bahl, 2018; P.25). Thus, the second hypothesis to be tested in this study is:

H₂. Young users are more likely to use a mobile device to follow regional and international news than old ones.

A not long time ago “The New York Times shipped a million headsets to its subscribers for free” (Robertson, 2019). Bimbisar reports that “[T]he technology, after all, aspires to deliver a fully immersive experience wherein the spectator will forget her or his position and participate in the simulated world”(Bimbisar, 2018; p.4270). Therefore, the third hypothesis to be tested in this study is:

H₃. Experience in using AR and VR to play games are significantly related to using a mobile device to follow regional and international news.

Shahizan and his colleagues believe that “[The] AIDA model has been applied widely for online marketing strategy, but its applicability for social media remains unknown”(Shahizan, Siti, Nadzim and Norshuhada, 2015; P. 262). As a result, the fourth hypothesis to be tested in this study is:

H₄. End user’s interest in using AR a VR environment is a prerequisite to end user’s adoption of mobile devices to follow regional and international news.

Previous research has shown that concerns about security and privacy are raised by users in the environment of wireless technology, mainly with regards to the control and access to personal information (Zhang, R., et al., 2013). In this context, the fifth hypothesis to be tested in this study is:

H₅. There is a significant relationship between the extent to which users are concerned about the security and the use of mobile devices.

Finally, Vikki K.& Carmen G. (2016) argued that controlled access to communication technologies is attached to social disparities related to income. Therefore, the sixth hypothesis to be tested in this study is:

H₆. There is a significant relationship between income and using mobile devices.

4. PROCEDURES AND METHODOLOGY

Study Design: The survey data was collected via a questionnaire designed to collect information related to the study. Items were developed in English and then translated into Arabic by professional translators. After that, the translated version was checked by teams of experienced interviewers to ensure that it is understood by the target population as intended. Next, this instrument was tested internally inside the Social and Economic Survey Research Institute (SESRI) to identify important concerns that affect responses to items. No matter what efforts the researcher put in this survey, using AR and VR on smartphone devices is a recent phenomenon in Qatar. As to be expected, they would not appeal to everyone who receives the questionnaire. The researcher, however, believes that opinions should be heard and that action should be taken based on the feedback.

Population/ Sample: The target population is comprised of Qataris and white-collar expatriates. A large convenience sample of 699 respondents from Qatar was surveyed, and the valid response rate on the items used for analysis was approximately 10%.

5. MEASURES

5.1. Dependent Variable

Importance and Reading Regional and International News

Mansour reports that “The main tasks done on smartphone devices were mainly for socializing. Students indicated that popular tasks and activities, such as sending and receiving messages, following the news, making communications, making chat, making friends, finding specific information, finding general information, making discussion groups, playing games, completing class assignments, checking materials related to courses, doing business, seeking jobs, watching movies, listening to music and accessing library services are important tasks accomplished by them through the use of these devices” (Mansour, 2016; p. 371). Respondents were asked about the importance of following regional and international news on their mobile phone and reading on mobile device a brief text of an important news story

5.2. Independent Variables

The independent variables included in multiple regression were a mixture of factor scores and demographic characteristics. All scaled items were analyzed using factor analysis, and factor scores were computed for further analysis, as mentioned under “Validity”. All other categorical variables were broken into two categories by looking at one category vs all others. Missing stays as missing in all cases!

Interest: Brun, Ferreira, Gouin- Vallerand and George noted that “ Smart eyewear, such as augmented or virtual reality headset, allows the projection of virtual content through a display worn on the user’s head”(Brun et al., 2017; P. 41). Respondents were asked (Q1) How Likely to use social media to share information about a VR experience, (Q2) How interested are you in using VR if it were available in Qatar, (Q3) How likely to use social media to share information about an AR experience and (Q4) How Interested in using AR via mobile phone if AR content were embedded into real-world objects in Qatar.

Security: Zhang, Li, and Deng observed that “there are serious concerns about information security in the use of smartphone” (Zhang, 2017; p. 177). Respondents were asked: “To what extent are you concerned about the security of using your credit card or bankcard information to buy something online via your mobile device and how concerned are you about privacy when using mobile devices? Are you very concerned, somewhat concerned, not very concerned, or not at all concerned?”

Mobile Augmented Reality (MAR) Game: Aluri believes that “Pokémon GO and similar MAR games bring people together. In fact, unlike social media, where users are spending significant amounts of time just browsing without posting or interacting with others, MAR games create face-to-face interactions” (Aluri, 2017; P. 55). Respondents were asked: Pokémon Go is a mobile game that uses AR. Please tell me how interested you are in playing Pokémon Go. Are you very interested, somewhat interested, not very interested, or not at all interested?

Income: Respondents were asked about their total household income for all members in their household considering all sources of monetary income (salary, profit, rental income, interest income, income from share market, pension, national allowance, divorce allowance, etc.).

Citizen: Respondents were asked “Are you a Qatari citizen?” and were given two options to select from (dichotomized into Qatari versus Non-Qatari).

Age: Respondents were asked: “In what year were you born?”

6. CONSTRUCT VALIDITY

The researcher used only nine scale items in Factor Analysis with factor loading above 0.7. Two statistical tests were used to determine the suitability of the factor analysis. First, the Kaisers-Meyer-Olkin (KMO) measure of sampling adequacy, which resulted in a score of 0.597, above the recommended level of 0.50. Second, the Bartlett test of sphericity result was significant (Chi-Square = 171.018, P = 0.00), indicating that there are adequate inter-correlations between the nine statements which permit the use of factor analysis as shown in Table 1. Oblique rotation was used, and four rotated factors were extracted using a criterion of an Eigenvalue greater than 1 as shown in Table 3. The four-factor solution accounted for 69.962% of the total variance as shown in Table 2.

Table 1 KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.597
Bartlett's Test of Sphericity	Approx. Chi-Square	171.018
	df	36
	Sig.	.000

Table 2 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings ^a
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	2.663	29.594	29.594	2.663	29.594	29.594	2.486
2	1.381	15.344	44.938	1.381	15.344	44.938	1.736
3	1.235	13.720	58.658	1.235	13.720	58.658	1.266
4	1.017	11.305	69.962	1.017	11.305	69.962	1.092
5	.755	8.388	78.350				
6	.721	8.006	86.356				
7	.587	6.525	92.881				
8	.376	4.178	97.059				
9	.265	2.941	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Table 3 Structure Matrix

	Component			
	1	2	3	4
Qint1 Likely to use social media to share information about a VR experience	.787	.282	-.073	-.085
Qint2 interested in using VR if it were available in Qatar	.783	.265	-.054	-.075
Qint3 Use social media to share information about an AR experience	.763	.140	.052	.299
Qint4 Interested in using AR via mobile phone	.708	.046	.115	.152
(Qnews) Importance of following regional and international news	.098	.902	-.042	-.010

(Qread) reading on your mobile device a brief text of an important news story	.382	.842	.143	-.048
(Security2) concerned are you about privacy when using mobile devices	.014	-.094	.829	.177
(Security1) To what extent are concerned are you about the security of using your credit card or bankcard	.004	.181	.728	-.282
(QARGame) Interested in using AR to play mobile game	.116	.013	-.040	.924
Extraction Method: Principal Component Analysis. Rotation Method: Oblimin with Kaiser Normalization.				

7. RESULTS

In regressing the dependent variable “Importance and reading regional and international news” on the other three explanatory variables, in addition to age, citizenship and family income, it was found that two hypotheses were supported. The regression equation is highly significant ($F = 2.731$, $p = 0.022$) and the R^2 is 0.243, as shown in Table 4 through Table 6.

Table 4 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.493 ^a	.243	.154	.97809808

a. Predictors: (Constant), CITIZEN Are you a Qatari citizen?, Concerned about the security , Interested in using virtual and augmented reality technologies, is your total monthly household income in Qatar less than QR 15,000 or QR, In what year were you born?, Using AR to play Games

Table 5 ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	15.676	6	2.613	2.731	.022 ^b
	Residual	48.790	51	.957		
	Total	64.467	57			

a. Dependent Variable: Importance of following and reading news on your mobile device

b. Predictors: (Constant), CITIZEN Are you a Qatari citizen?, Concerned about the security , Interested in using virtual and augmented reality technologies, is your total monthly household income in Qatar less than QR 15,000 or QR, In what year were you born?, Using AR to play Games

8. CONCLUSION AND RECOMMENDATIONS

Following regional and international news over the mobile devices has been gaining a reputation as the smartphones proliferated and the high-speed mobile data networks become progressively abundant during the last years. Bradshaw (2010) argue that much of the innovation in the digital era has been happening outside the realm of news organizations. What is more, large news organizations have not always been at the top of digital modernism, though there have been some exceptions. Big organizations such as Apple and Google often prove to be the most innovative in their use of emerging digital, online, and mobile technologies (Bradshaw P., 2010). Miller H. (2011) believe that AR demands a necessary software and a meaningfully installed base of smartphones and tablet devices to be functioning and this demand is progressively being encountered in the smart cities of the world. This study shed light on the fact that end user’s interest in using AR a VR environment is a prerequisite to end user’s adoption of mobile devices to follow regional and international news. Several studies have shown that mobile technology has been rapidly being adopted in our day to day life, and it is becoming common for people to carry their smart phones with

them at all times (Mac Callum et al., 2014). Gone are the days when Arabs in general and Qataris, in particular, have to wait to get the traditional printed newspapers or watch TV to hear the news. In recent years, we observed that the more the end-users are interested in having AR and VR on their smartphones, the more they can get a personal touch of the published newspaper at the click of a mouse without having to go to a local store every day and purchase newspapers. This calls the traditional news industry to start adding the WOW factors provided by AR and VR capabilities to their websites to motivate and persuade customers to buy their online newspapers. The question that needs to be investigated in future research is, how can the traditional newspapers in Qatar incorporate these innovative features into their websites? What is more, in view of the fact that AR and VR are not the same and have different characteristics and foundations, it becomes imperative for the traditional printed newspapers to benefit from AR and VR full capacity so as to make the interactive reader's experience inside his room very cool and at the same time boost their sales via smartphones. Future research has to revisit the technology acceptance model to investigate if the intention to follow online news in AR and VR environment will stay more accessible and attractive than reading the traditional news or the online news without AR and VR environment.

The conclusion of this investigation in the researcher's opinion is the two implications for theory and practice. From a theoretical point of view, more research in this new innovative area is needed. While from the practical point of view, decision-makers should benefit from the findings of this study to focus on customer's interest in promoting AR and VR to satisfy the needs of interactive customers and increase sales.

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