WhatsApp

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Abstract. More than one billion people use WhatsApp nowadays, out of which 70% uses it daily. In this scenario, this study seeks modelling the variables that influence the intention to use WhatsApp. To this end, 579 surveys based on the Unified Theory of Acceptance and Use of Technology are conducted. The descriptive results show that individuals use WhatsApp mainly motivated by leisure. In this sense, according to the SEM, the variable with greatest influence on behavioral Intention is hedonic motivation, followed by social influence, performance expectancy and effort expectancy. These results indicate that people use WhatsApp principally because it is fun, enjoyable, very entertaining, something more inherent to an entertainment application than to a messaging application.

Keywords: WhatsApp · Social computing · Leisure

1 Introduction

More than a billion people in more than 109 countries use WhatsApp to keep in touch with their friends and family, at any time and place. WhatsApp is free, and offers messaging and calls in a simple, safe and reliable way that is available in smartphones around the world. In fact, currently more than 42 billion messages are sent, and more than 100 million voice calls are made through this application. Furthermore, 70% of the WhatsApp users report using it daily, and on average 1 million of new users register per day [16]. In this context, some questions arise with respect to the motivators that affect the use of WhatsApp, in other words, why are people using WhatsApp? In that sense, this work intends to determine what factors influence the intention to use this popular application and how the relationship of these factors is articulated.

2 Literature Review

One of the first successful attempts to model the intention to use technological systems was the Technology Acceptance Model [6]—created as link to the world of the technologies of the Theory of Reasoned Action [7]—which explains the intention to use a technology based on the perceived ease of use defined as the degree to which a person believes that using a particular system would be free of effort [6] and the

perceived usefulness defined as the degree to which a person believes that using a particular system would enhance his or her job performance [6]. Subsequently, various efforts were made to enhance this model, including the addition of social influence named subjective norm and cognitive processes variables such as image, job relevance, output quality, result demonstrability, and experience and voluntariness [19]. Later on, this was also attempted by means of the Unified Theory of Acceptance and Use of Technology [20]. This theory aims at predicting the intention to use using variables such as performance expectancy, effort expectancy and social influence, which have a definition similar to that of perceived usefulness, perceived ease of use and subjective norm, respectively. Other variable added was facilitating conditions, defined as the extent to which an individual believes that some organizational and technical infrastructures exist to support the use of a system [20]. However, the original TAM model was created to examine IT/IS adoption in business organizations. Then, Venkatesh, Thong and Xin Xu [21] proposed extending the Unified Theory of Acceptance and Use of Technology, to study the acceptance and use of technologies in a consumption setting, incorporating three new variables: hedonic motivation, price value and habit. As can be seen, the motivations to use ICT's are varied. According to Brandtzaeg and Heim [4], people use social networks to get in contact with new people, to keep in touch with their friends and general socializing, which might be closely related to the subjective norm. On the other hand, Quan-Haase and Young [13] support that people use instant messaging to maintain and develop their relationships, as well as to kill time [11]. Furthermore, Xu et al. [22] suggest that user utilitarian gratifications of immediate access and coordination, hedonic gratifications of affection and leisure—which might be related to perceived usefulness and to perceived ease of use, accordingly—and website social presence are three positive predictors of usage.

In the case of WhatsApp, there are certain motivators linked to cost, sense of community and immediacy [5], as well as to unlock new opportunities for intimate communication [8]. Moreover, even addictive behaviors have been detected towards this application [18]. In this sense, several studies have been carried out on the use of Whatsapp [12], the importance of family groups [1], the use of status within the application [15], interactions in educational settings [3, 17], and concerns about privacy [14], among others. This article intends to model the intention to use WhatsApp, based on the Unified Theory of Acceptance and Use of Technology [21].

3 Methodology

To model the intention to use WhatsApp and understand the variables explaining the attitudes towards this application, a study with an initial exploratory stage is conducted to review the background details of the use of this application at a global level. Subsequently, a concluding second stage consisting in the application of an online questionnaire to 579 people is conducted. To this end, a questionnaire was elaborated based on the variables of the UTAUT2 model [21]. The sample is composed mostly by young people, university students and graduates, due to the high degree of penetration that WhatsApp has in their daily lives.

The model proposed considers the following variables: hedonic motivation, performance expectancy, effort expectancy, social influence, and behavioral intention. First, hedonic motivation is defined as the pleasure an individual feels when behaving in a particular way or carrying out a specific activity [10]. Second, performance expectancy points to the extent to which using a technology benefits consumers when performing certain activities [21]. Third, effort expectancy is the degree of ease associated with consumers' use of technology [21]. Fourth, social Influence is the extent to which consumers perceive it is important that others think they should use a particular technology [21]. The latter social influence or subjective norm is closely related to the intention to use a social network [9]. Lastly, behavioral intention refers to the set of motivational factors that indicate to what extent people is willing to try or how much effort they plan to make in order to develop certain behavior [2]. The structural model, together with its latent variables and the proposed relationships, are shown in Fig. 1.
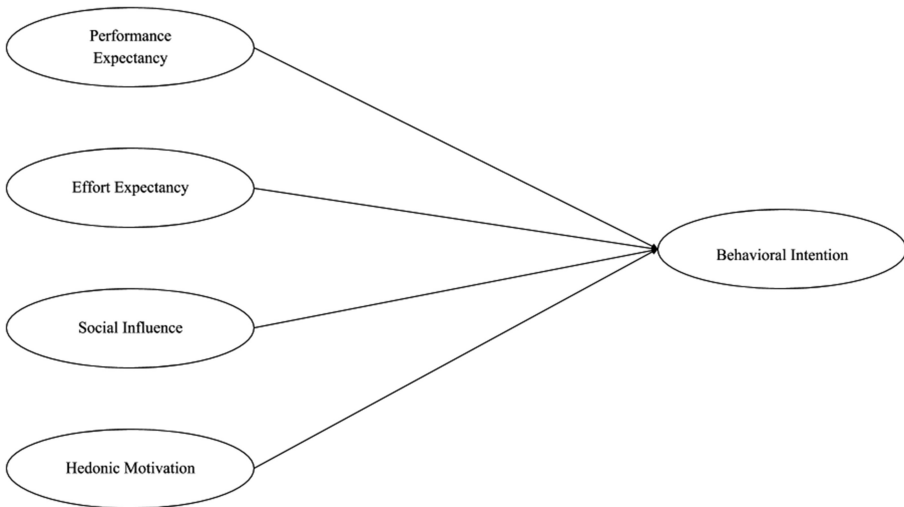
Fig. 1. Proposed model

As can be seen in the Fig. 1 a simplified model is proposed, it allows to measure the intention to use WhatsApp based on the direct influence of the variables Performance Expectancy, Effort Expectancy, Social Influence, and Hedonic Motivation.

In that sense and regarding the latent variables included in the structural model, Table 1 shows the observable variables, which were assessed using a Likert-type scale ranging from 1 to 5 in the survey that was applied to a total of 579 individuals. Thus, the first four variables refer to Performance Expectancy, the following four questions refer to Effort Expectancy. Then, the following three variables refer to Hedonic Motivation, and the next three variables to Social Influence. Finally, the last three questions refer to the Behavioral Intention of using WhatsApp. The questionnaire also contains variables to measure demographic variables such as sex, age and their last level of education completed, as well as questions to measure behavioral variables such

Table 1. Observed variables

I find WhatsApp useful in my daily life
Using WhatsApp increases my chances of achieving things that are important to me
Using WhatsApp helps me accomplish things more quickly
Using WhatsApp increases my productivity
Learning how to use WhatsApp is easy for me
My interaction with WhatsApp is clear and understandable
I find WhatsApp easy to use
It is easy for me to become skillful at using WhatsApp
Using WhatsApp is fun
Using WhatsApp is enjoyable
Using WhatsApp is very entertaining
People who are important to me think that I should use WhatsApp
People who influence my behavior think that I should use WhatsApp
People whose opinions that I value prefer that I use WhatsApp
I intend to continue using WhatsApp in the future
I will always try to use WhatsApp in my daily life
I plan to continue to use WhatsApp frequently

as the number of hours per day devoted to the use of WhatsApp and the number of times per day that respondents use this application.

4 Analysis and Results

As aforementioned, a total of 579 valid surveys were obtained, that is, eliminating incomplete or biased answers. Out of the respondents, 57% are women while the others 249 respondents are men. In terms of educational level, 60% were still university students, followed by 25% people with complete higher education.

Regarding the motives to use the application, 62.3% reported mainly using WhatsApp for leisure, while the following 23.4% used this application for informational purposes. The remaining respondents manifested that they use WhatsApp primarily in their jobs, more precisely, as a working tool. While it is clear that WhatsApp usage is explained by a combination of work, leisure, information and other motivators, the purpose of the question is to understand what is the primary use with which consumers perceive WhatsApp to be related, in that sense, it is interesting to rescue the close relationship with leisure and fun.

Afterwards, a descriptive analysis of the observable variables of the questionnaire is made, Table 2 shows the mean and standard deviation obtained for each one of the questions applied to measure the proposed model.

Table 2 shows that most of the observed variables get a mode of 5, it should be remembered that the scale used for the survey corresponds to a Likert scale five points, where 1 means strongly disagree, 2 means disagree, 3 means neither agree nor disagree, 4 means agree and 5 means strongly agree. In fact, it is remarkable the case of the four

Table 2. Descriptive statistics of observed variables

Observable variable	Mode	Mean	SD
I find WhatsApp useful in my daily life	5	4.42	.97
Using WhatsApp increases my chances of achieving things that are important to me	4	3.67	1.28
Using WhatsApp helps me accomplish things more quickly	5	3.97	1.21
Using WhatsApp increases my productivity	4	3.01	1.41
Learning how to use WhatsApp is easy for me	5	4.61	.89
My interaction with WhatsApp is clear and understandable	5	4.47	.95
I find WhatsApp easy to use	5	4.63	.85
It is easy for me to become skillful at using WhatsApp	5	4.53	.92
Using WhatsApp is fun	5	4.31	.98
Using WhatsApp is enjoyable	5	4.22	1.03
Using WhatsApp is very entertaining	5	4.22	.97
People who are important to me think that I should use WhatsApp	5	3.75	1.23
People who influence my behavior think that I should use WhatsApp	3	3.42	1.28
People whose opinions that I value prefer that I use WhatsApp	5	3.73	1.25
I intend to continue using WhatsApp in the future	5	4.40	.96
I will always try to use WhatsApp in my daily life	5	3.81	1.27
I plan to continue to use WhatsApp frequently	5	4.21	1.04

questions that point to measure the Effort Expectancy as they reach a mode of 5 with standard deviations less than 1, Learning how to use WhatsApp is easy for me (4.61), My interaction with WhatsApp is clear and understandable (4.47), I find WhatsApp easy to use (4.63), and, It is easy for me to become skillful at using WhatsApp (4.53).

On the other hand, there is a variable that reach a mode of 3, this implies that the majority of the respondents states not to agree or disagree with the assertion, this is the case of the variable People who influence my behavior think that I should use WhatsApp (3.42). This could mean that the opinion of people who influence my behavior is not transcendental when deciding whether or not I should use WhatsApp, then the intention to use this mobile application does not respond to the influence of people close to me. However, when the standard deviation is found to be among the highest between the observed variables (1.28), a second look at this question suggests that there might be people who influence my behavior who thinks I should use WhatsApp while there are other people which also influence my behavior but think I should not use WhatsApp. For example, my friends think I should use WhatsApp and keep sending those funny memes, while my boss and my doctor think I should not use WhatsApp, focus on my work and do more exercise to stay healthy. This second explanation for the low valuation achieved by this observed variable makes more sense when it is found that the observable variable with the highest standard deviation is using WhatsApp increases my productivity (1.41), following our example above, maybe my boss is right and I should stop using WhatsApp to focus on doing my job. Maybe not.

Finally, the interesting thing about this first approximation to the data is that it seems that the most important variables are Effort Expectancy and Hedonic Motivation. So, it can be assumed that people intend to use WhatsApp motivated by the fun they find when using it and the ease of use that shows this popular mobile app.

After the descriptive analysis, a scales reliability analysis is performed using Cronbach's alpha test in IBM SPSS Statistics. Regarding this analysis, it may be seen that the five independent structural variables of the model (Performance expectancy, Effort expectancy, Social influence and Hedonic motivation) have satisfactory results in terms of the reliability of the constructs used, they all are higher than 0.7, this is also repeated for the dependent variable in the structural model, where Behavioral Intention achieves a Cronbach's alpha of .812. It should be noted that none of the structural model variables obtained a higher Chronbach's alpha by eliminating some of the observable variables in each case. The results are shown in Table 3.

Table 3. Cronbach's alpha reliability analysis

Performance expectancy	.736
Effort expectancy	.801
Social influence	.867
Hedonic motivation	.725
Behavioral intention	.812

Then, the structural model was tested using IBM SPSS Amos, thereby obtaining an adequate absolute, incremental, and parsimony model fit. Figure 2 shows the structural equation model, with the observable variables and errors in each case. It is important to mention first that all the proposed relationships between latent variables are significant (p-value < .001).

As described in Fig. 2, the model reaches a coefficient of determination of .52 to model behavioral intention of use WhatsApp. In this sense, it can be assumed that this simple model is able to explain 52% of the variability in the intention to use this popular application for smartphones. Then, the influence of the latent variables proposed as independent variables of the model is analyzed, for this the standardized regression weights of latent variables are analyzed.

The most influencing variable is hedonic motivation, with a standardized regression weight of .499, which indicates that people use WhatsApp motivated mainly by pleasure, entertainment and fun. This is also related to the 62.3% of users that reported using WhatsApp for leisure, as noted above. The other variables that explain the behavioral intention to use this instant messaging application are social influence, with a .333 standardized estimate, followed by performance expectancy (.305), and effort expectancy (.256). After reviewing some of the observable variables, it should be first noted that, for the hedonic motivation factor, the variable "Using WhatsApp is fun" obtains a very high mean of 4.37 and a mode corresponding to 5, what it means that respondents are tally agree with the fact that using WhatsApp is fun. On the other hand, it is interesting to remark the social influence factor, where the variable "People who are important to me think that I should use WhatsApp" achieves a mean of 3.57, with its
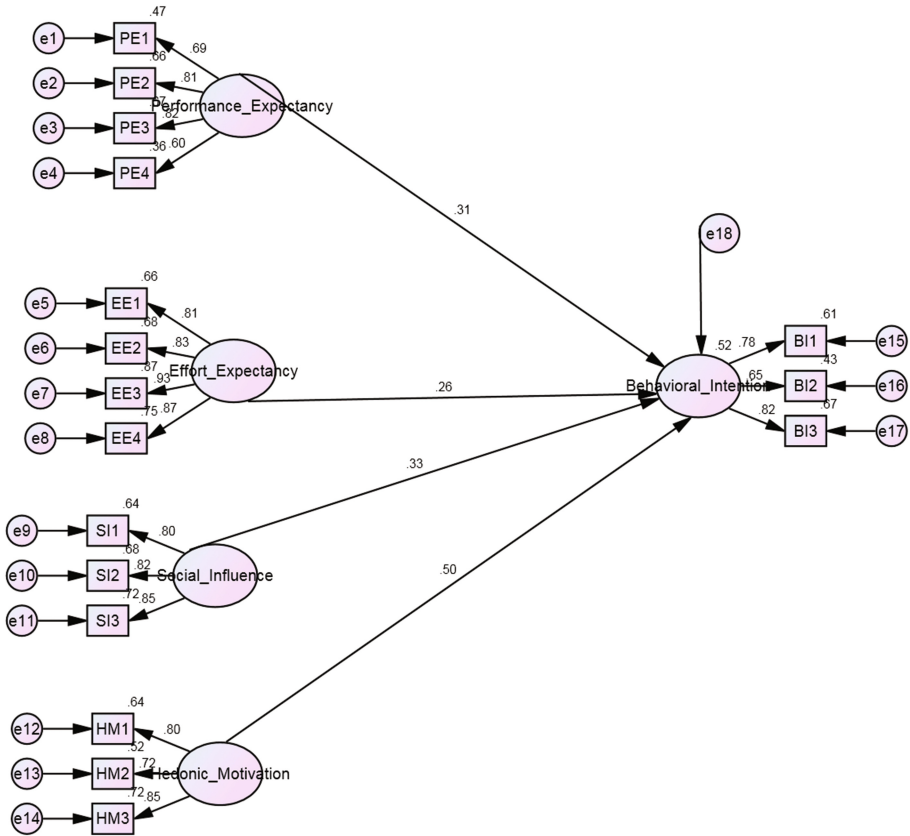
Fig. 2. Result model

mode in 3, thus indicating a certain degree of indifference regarding social influence as staded before. In fact, if considering the three observable variables of social influence, a mean of 3.75 is obtained with highest standard deviation. Finally, the variable "Using WhatsApp increases my productivity" also stands out due to its high dispersion, with a standard deviation of 1.41 and a mean of 3.01. Therefore, some questions arise about whether this observed variable is applicable to a technology of this kind, anyway, if this variable is removed from the study the Cronbach's alpha of the performance expectancy remains at .783.

5   Discussion

Based on the results of the study, it is observed that the variable that influences the most the intention to use WhatsApp is hedonic motivation, that is, people use What-sApp because it is fun, enjoyable, and very entertaining. This, coupled with the fact that respondents express that their main motivation to use WhatsApp is leisure, lead us to

think that this application is perceived more as a form of entertainment than as a means of communication or, in other words, it is used to communicate with close people and to seek entertainment through that interaction, thereby unlocking new opportunities for intimate communication [8] while sending memes, videos and links to entertaining things.

Although all the variables are significant in the proposed model, it should be noted the low impact of social influence, for which a greater influence was expected, since WhatsApp is an instant messaging application that does not work if people important to us are not using it, moreover, a high valuation was expected (between 4 to 5) for the variables contained in the social influence factor, owing to the fact that WhatsApp is an application that allows people to communicate with family and friends. The descriptive statistical analysis previously shown suggests that the low impact of Social Influence on Behavioral Intention of using WhatsApp can be explained to a great extent because there are people who influence my behavior who thinks I should use WhatsApp while there are other people which also influence my behavior but think I should not use WhatsApp. As exemplified above, my friends could widely agree that I use whatsapp while my doctor might recommend not using whatsapp and do more exercise to stay healthy. In that sense, it could also be that people who influence my behavior may think that I should use WhatsApp in some contexts, for example to warn that I am coming late to a meeting, but at other times they could say that I should not use WhatsApp, for example when I am having dinner with them in a restaurant. Then, measuring Social Influence as a predetermining factor of Behavioral Intention turns difficult in the case of WhatsApp.

Even though the influence of Performance Expectancy on Behavioral Intention is positive and significant, it is also worth mentioning the high degree of variability of the observable variables that make up Performance Expectancy. This could be explained by the fact that there is more than one type of WhatsApp user, thus, if people admit to using WhatsApp because it is entertaining, fun and enjoyable, the use of WhatsApp could be detrimental to their work performance. On the other hand there are those who also find it entertaining, fun and enjoyable, but they are able to use it as a communication tool that supports their productivity and performance in things important to them.

Finally, this study achieves to explain the intention to use in 52% of the cases with the most important variable being hedonic motivation, then, the positioning that this type of applications should seek in the minds of consumers might not only appeal to be a tool of communication, but an entertaining funny and enjoyable communication.

References

1. Aharony, N., Gazit, T.: The importance of the WhatsApp family group: an exploratory analysis. Aslib J. Inf. Manage. **68**(2), 174–192 (2016)
2. Ajzen, I.: The theory of planned behavior. Organ. Behav. Hum. Decis. Process. **50**(2), 179–211 (1991)
3. Bouhnik, D., Deshen, M.: WhatsApp goes to school: mobile instant messaging between teachers and students. J. Inf. Technol. Educ. Res. **13**, 217–231 (2014)

4. Brandtzæg, P.B., Heim, J.: Why people use social networking sites. In: Ozok, A.A., Zaphiris, P. (eds.) Online Communities and Social Computing, OCSC 2009. LNCS, vol. 5621, pp. 143–152. Springer, Heidelberg (2009). doi:10.1007/978-3-642-02774-1_16

5. Church, K., de Oliveira, R.: What's up with WhatsApp?: comparing mobile instant messaging behaviors with traditional SMS. In: Proceedings of the 15th International Conference on Human-Computer Interaction with Mobile Devices and Services, pp. 352–361. ACM (2013)

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

7. Fishbein, M., Ajzen, I.: Belief, attitude, intention, and behavior: an introduction to theory and research. Philos. Rhetoric **10**(2), 130–132 (1977)

8. Karapanos, E., Teixeira, P., Gouveia, R.: Need fulfillment and experiences on social media: a case on Facebook and WhatsApp. Comput. Hum. Behav. **55**, 888–897 (2016)

9. Ku, Y.C., Chu, T.H., Tseng, C.H.: Gratifications for using CMC technologies: a comparison among SNS, IM, and e-mail. Comput. Hum. Behav. **29**(1), 226–234 (2013)

10. Moon, J.W., Kim, Y.G.: Extending the TAM for a World-Wide-Web context. Inf. Manag. **38**(4), 217–230 (2001)

11. Pelling, E.L., White, K.M.: The theory of planned behavior applied to young people's use of social networking web sites. CyberPsychology Behav. **12**(6), 755–759 (2009)

12. Pielot, M., de Oliveira, R., Kwak, H., Oliver, N.: Didn't you see my message?: predicting attentiveness to mobile instant messages. In: Proceedings of the 32nd Annual ACM Conference on Human Factors in Computing Systems, pp. 3319–3328. ACM (2014)

13. Quan-Haase, A., Young, A.L.: Uses and gratifications of social media: a comparison of Facebook and instant messaging. Bull. Sci. Technol. Soc. **30**(5), 350–361 (2010)

14. Rashidi, Y., Vaniea, K., Camp, L.J.: Understanding Saudis' Privacy Concerns when Using WhatsApp (2016)

15. Sánchez-Moya, A., Cruz-Moya, O.: "Hey there! I am using WhatsApp": a preliminary study of recurrent discursive realisations in a corpus of WhatsApp statuses. Procedia-Social Behav. Sci. **212**, 52–60 (2015)

16. Smith, C.: DMR (n.d.). http://expandedramblings.com. Accessed 11 Nov 2016

17. So, S.: Mobile instant messaging support for teaching and learning in higher education. Internet High. Educ. **31**, 32–42 (2016)

18. Sultan, A.J.: Addiction to mobile text messaging applications is nothing to "lol" about. Soc. Sci. J. **51**(1), 57–69 (2014)

19. Venkatesh, V., Davis, F.D.: A theoretical extension of the technology acceptance model: four longitudinal field studies. Manage. Sci. **46**(2), 186–204 (2000)

20. Venkatesh, V., Morris, M.G., Davis, G.B., Davis, F.D.: User acceptance of information technology: Toward a unified view. MIS Q. **27**(3), 425–478 (2003)

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

22. Xu, C., Ryan, S., Prybutok, V., Wen, C.: It is not for fun: an examination of social network site usage. Inf. Manag. **49**(5), 210–217 (2012)