

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/264744870>

Behavioral Intention and Satisfaction with 3G Technology among Students in Somalia: A Structural Equation Modeling Study

Article in *World Applied Sciences Journal* · January 2014

DOI: 10.5829/idosi.wasj.2014.32.02.331

CITATIONS

4

READS

354

2 authors:



Ismail Sheikh Yusuf Ahmed
Qatar University

29 PUBLICATIONS 153 CITATIONS

[SEE PROFILE](#)



Ali Yassin sheikh Ali
SIMAD University

68 PUBLICATIONS 691 CITATIONS

[SEE PROFILE](#)

Behavioral Intention and Satisfaction with 3G Technology among Students in Somalia: A Structural Equation Modeling Study

¹Ismail Sheikh Yusuf Dhaha and ²Ali Yassin Sheikh Ali

¹Department of Communication,
International Islamic university Malaysia, 53100, Kuala Lumpur, Malaysia

²Faculty of business and accountancy,
SIMAD University, Mogadishu, Somalia

Abstract: Third generation mobile telecommunication technology (3G) was widely adopted. It has become an essential part of the today's activities for considerable segments of populations in the world. Theoretically driven by unified theory of acceptance and use of technology, the current study investigates the factors underlying behavioral intention and satisfaction with 3G technology among students in Somalia. By employing stratified random sampling, this study collected the data from 395 students in a private university in Somalia. The structural equation modeling (SEM) approach was employed to analyze and test the hypothesized model. The results of SEM suggested that behavioral intention to adopt 3G mobile technology has been positively influenced by social influence, performance expectancy, effort expectancy and perceived expense, whereas performance expectancy, social influence and behavioral intention were determinants of students' satisfaction with the 3G mobile technology. Limitations, theoretical and practical implications were discussed.

Key words: 3G mobile technology • SEM • Performance expectancy • Perceived expense • Effort expectancy • Social influence

INTRODUCTION

Third generation (3G) technology became popular and it was widely explored the factors behind its adoption and usage. It is different from the second and first generations in terms of speed in data transmission [1]. It provides to its users a clear hearing of the voices, higher speeds and browsing the websites in a comfortable ways [1]; entertainment, pricing strategies, network and e-payment [2]. There are three important services provided by 3G technology. These include multimedia, mobile internet and audio and video services as well as it provides a lot of suitable and enjoyment to its users [1]. This technology, a widely accepted globally by many different people, gives convenience to its users. It became indispensable, with the emergence of new and advanced mobile devices, for majority of the people. People use it to reconnect with what happening in the worlds, keep in touch with their friends, family members and business partners, as well as get latest updates about the social, economic and political events.

NTT DOCOMO, a leading Japanese telecommunication company launched the first world 3G technology in October 2001 [2], followed by other major telecommunication companies in Japan. Subsequently, 3G technology was launched in many other countries, providing convenience to its users. Abu [2] further elaborated how the technological innovations participated in the development and betterment of 3G technology in Japan.

In Somalia, Hormuud Telecom, a leading telecommunication company in the county launched the first 3G technology in December 2012. The target population for this new technology constitutes the central and southern regions, where this company had the highest market share. The emergence of this new technology is expected to have greater effect on the domestic economic [3]. Hussein [3] stated that the subscription of 3G technology is overwhelmingly increased during the first few months of its introduction, even 3G was introduced to Somalia late time as compared to other countries in Asia, Africa and Europe, which already started to test 4G mobile network.

Although it is widely adopted, very little is known about the current status of 3G technology usage and adoption among Somalis. As a result, this study examines the underlying factors affecting the behavioral intention to use and adopt 3G technology among the students in a private university in Mogadishu, Somalia. The study will enrich the existing literature on the 3G adoption from the developing countries perspective.

Specifically, this study seeks to achieve the following objectives:

- To validate extended UTAUT model.
- To test the structural invariance across gender and age of the students.
- To examine the influences of performance expectancy, effort expectancy, social influence and perceived expense on the behavioral intention to use 3G technology.
- To investigate the impact of behavioral intention on students' satisfaction with the 3G technology.

Literature Review

Telecommunications Sector in Somalia: Somalia, located in the horn of Africa and bound by Kenya to the southwest, Djibouti to the northwest, Indian Ocean to the northeast, Ethiopia to the west and the Gulf Aden to the north, experienced a civil war for two decades. Chaotic situation and political instability were major challenges. Despite these, the telecommunication sector was major economic contributor and evolved during the last ten years. Several companies provide landline and cellular phone service. These include Somali Telecom, *Hormuud* Telecom, *Nationlink*, *Golis* and others. The telecommunication industry provides the cheap rates for the households for \$10 per month with unlimited local calls [4]. The industry also provides the cheapest and lowest call rates in whole Africa [5], which makes the market to be too competitive to provide quality services that meets the customers' expectations. This industry is considered a major contributor to the economics of the country [6], because of unavailability of other important sectors and industries.

The telecommunication industry is not only providing mobile phones, but also mobile banking services. *Hormuud* and *Nationlink* companies provide EVC Plus and *E-Maal* mobile money transfer services respectively, while *Golis* Telecom in northeastern regions and Somali Telecom in northern regions provide *Sahal* and *ZAAD* mobile money transfer services respectively [7]. These

technologies allow the people to send and receive money through their mobile phones, whereas they can recharge their balance using the airtime service. Other services provided by the industry include 3G mobile phone network. *Hormuud* Telecom was the first to introduce 3G technology to the southern regions at the end of 2012. This service provides further improvement for the poor internet access and will have greater impact to the students, academician, businessmen and the entire public.

Unified Theory of Acceptance and Use of Technology:

Unified Theory of Acceptance and Use of Technology (UTAUT) was proposed by Venkatesh, Morris, Davis and David [8]. The theory is developed on the assumption of eight existing theories on the technology acceptance literature, including Theory of Reasoned Action, Social Cognitive Theory, the Motivational Model, the Theory of Planned Behavior, the Innovation Diffusion Theory, Technology acceptance model, a Model Combining the Technology Acceptance Model and the Theory of Planned Behavior and the Model of PC Utilization.

Four major factors determine the behavioral intention and use of a new technology. There are also four factors such as gender, age, experience and voluntariness moderate the effects of the major determinants on the outcome variable (behavioral intention). The four predictors include performance expectancy, effort expectancy, social influence and facilitating conditions. Venkatesh *et al.* [8] conducted several studies to validate their theory and found empirical support for the hypothesized model. Oshlyansky, Cairns and Thimbleby [9] validated the theory cross-culturally by applying to nine different countries in different continents. Oshlyansky *et al.* [9] provided support for the assumptions and hypotheses of the theory and UTAUT constructs predicted behavioral intention across nine countries.

Moreover, the UTAUT theory was tested cross-culturally for its predictive explanation. In a longitudinal study conducted by Venkatesh and Zhang [10], the theory was tested in US and China, comparing the differences and similarities according to predictors and moderators of the theory. It was found that the theory is universal and applicable to the other contexts and cultures. Venkatesh and Zhang's [10] study revealed seventy percent of variance in behavioral intention is explained by the four major determinants, as compared to 64 percent in the context of China. In addition, they found that national culture plays an important role in this theory.

3G Mobile Technology Usage: Past studies applied several theoretical frameworks to study mobile technology usage including diffusion of innovation theory, TAM, UTAUT model, Use-diffusion theory, theory of planned behavior, network externalities theory [11-18]. These studies used several constructs driven from the discussed theories of information and technology acceptance literature.

Although the predictive explanation of UTAUT constructs on the behavioral intention to use a new technology was proved through several empirical studies in many contexts [8, 10]. Nonetheless, a little is known about its predictive explanation in the context of 3G technology. Few studies examined factors affecting 3G adoption from UTAUT perspective [19, 20].

Using UTAUT approach, Wu *et al.* [19] explored the determinants of 3G mobile services use and acceptance in Taiwan. The results of this study suggested that behavioral intention to adopt 3G technology is determined by facilitating conditions, social influence and performance expectancy. However, effort expectancy did not exert any influence on behavioral intention. In addition, it was observed a direct influence of the four predictors on the use behavior among Taiwanese respondents [19]. By integrating TAM and UTAUT model, Mardikyan *et al.* [20] found that service quality, variety of services, perceived usefulness, social influence and price significantly predicted the behavioral intention to adopt 3G mobile technology among Turkish respondents. Therefore, the current study investigates underlying factors of behavioral intention and satisfaction with 3G mobile technology and driven by UTAUT assumptions. In addition, this study enriches the literature on the prediction of 3G technology adoption from the perspective of UTAUT theory.

Research Framework: This study, guided by UTAUT theory [8], attempts to assess the factors that determine the intention and satisfaction with 3G technology among students in a Sub-Saharan African country (Figure 1). This study extends the UTAUT model by incorporating additional constructs: perceived expense and users' satisfaction. The first construct is special for the context of 3G technology since the price is an important factor when it comes to purchase a product [14, 21, 22]. While the second construct tries to capture an element underestimated in previous studies on this topic.

As proposed by Venkatesh *et al.* [8], four factors determine the users' behavioral intention of a new technology, namely social influence, performance expectancy, effort expectancy and facilitating conditions. As shown in figure 1, this study proposes that social influence, performance expectancy, effort expectancy and perceived expense are significant contributing factors towards the users' intention to adopt 3G technology, whereas user's intention, in turn, influences the users' satisfaction with the service. It should be noted that this study is not examining the moderating effects of experience and voluntariness as postulated by the theory.

Performance Expectancy and Behavioral Intention: Performance expectancy in this study is defined as the students' perceptions about the effectiveness of 3G mobile technology in fulfilling their expectation. It means that if the students perceived 3G as a useful, it is more likely to adopt it in their daily live. In the information systems and technology acceptance literature, there are five constructs, which are similar with performance expectancy [8]. These are relative advantage, extrinsic motivation and perceived usefulness, outcome expectation and job-fit.

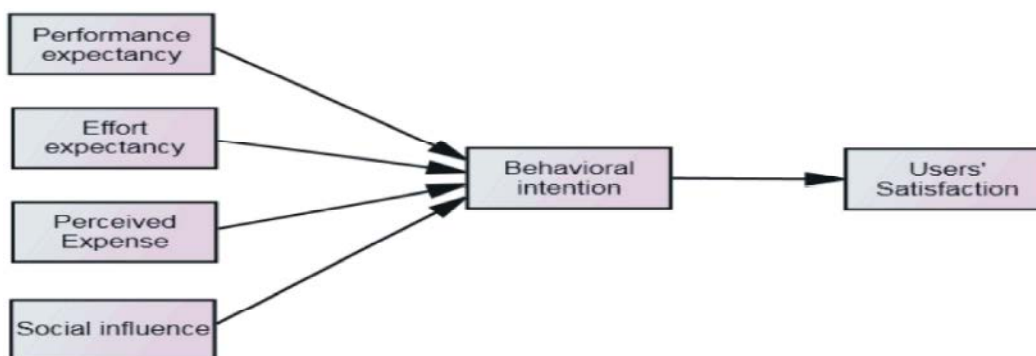


Fig. 1: Hypothesized Model

Performance expectancy was found to be a predictor of 3G mobile technology among Taiwanese consumers [19] and mobile technology for learning purposes [23]. In addition, other similar constructs such relative advantage [13] and perceived usefulness [17] were factors behind Malaysian consumers' intention to adopt 3G technology, Whereas this later construct was also a significant factor in adopting the service among Chinese users [18]. However, it is reported that this construct is not a predictor of behavioral intention in the context of Taiwan [11, 14]. Therefore, this study hypothesizes that:

H1a: Performance expectancy significantly determines the students' behavioral intention to adopt 3G mobile technology.

H1b: Gender significantly moderates the effects of performance expectancy on the students' behavioral intention to adopt 3G mobile technology.

H1c: Age significantly moderates the effects of performance expectancy on the students' behavioral intention to adopt 3G mobile technology.

Effort Expectancy and Behavioral Intention: This construct is defined as the perceived degree of easiness of using 3G mobile technology among students. In another words, the more the positive perception of students, the more they adopt the service and recommend it for others. As pointed out by Venkatesh *et al.* [8], three constructs from other models capture the meaning of this construct, namely complexity, perceived ease of use and ease of use. Effort expectancy was a significant predictor in the original model [8, 10]. Perceived ease of use was found to have significant effect on intention to use 3G technology among Malaysians [17], Turkish [20] and through attitude among Taiwanese [14]. In addition, Malaysian students' intention to use 3G mobile is determined by perceived compatibility [13]. In other studies [18, 19], it has been found that that effort expectancy and perceived ease of use had no effect on behavioral intention to use 3G mobile among Taiwanese and Chinese consumers respectively. Demographics moderations were observed in the original mode, but not in other studies. With these contradicting results, this study posits that:

H2a: Effort expectancy positively influences the students' behavioral intention to adopt 3G mobile technology.

H2b: Gender significantly moderates the effects of effort expectancy on the students' behavioral intention to adopt 3G mobile technology.

H2c: Age significantly moderates the effects of effort expectancy on the students' behavioral intention to adopt 3G mobile technology.

Social Influence: Social influence is defined as degree of influence creates by the peer, friends, lecturers and surroundings. It means if the students perceived 3G mobile technology as important, it is more likely to adopt it and recommend for others. Social factors, Image and subjective norms in other existing models are similar with the social influence construct [8]. Social influence was found to be a predictor of behavioral intention in the original model [8, 10] and in the context of 3G technology among Chinese and Turkish users [20, 22]. Furthermore, perceived image had significant effect on behavioral intention to use 3G technology among Malaysians [13]. Gender and age were significant moderators in the original model [8], however, it was not true in mobile technology [23]. Thus, this study posits that:

H3a: Social influence positively influences the students' behavioral intention to adopt 3G mobile technology.

H3b: Gender significantly moderates the effects of social influence on the students' behavioral intention to adopt 3G mobile technology.

H3c: Age significantly moderates the effects of social influence on the students' behavioral intention to adopt 3G mobile technology.

Perceived Expense and Behavioral Intention: This construct is defined as the degree of cheapness or expensiveness associated with the purchase of 3G technology. It also means the evaluations and expectations of the students about the price and benefits of the service [21]. If the students perceived that the service is affordable, they are more likely to adopt and recommend it for others. Other similar concepts were found in the literature: perceived cost, price and perceived price. Teng *et al.* [21] found a significant effect of perceived expense on the behavioral intention among Taiwanese users. In addition, a negative effect of this construct was reported in another study [22]. Malaysians and Turkish consumers were influenced by perceived

financial cost and price to adopt 3G mobile services respectively [13, 20]. As such, this study postulates that:

H4a: Perceived expense positively influences the students' behavioral intention to adopt 3G mobile technology among students.

H4b: Gender significantly moderates the effects of perceived expense on the students' behavioral intention to adopt 3G mobile technology.

H4c: Age significantly moderates the effects of perceived expense on the students' behavioral intention to adopt 3G mobile technology.

Behavioral Intention and Users' Satisfaction: Behavioral intention in this study is defined as the students' willingness to use and purchase 3G mobile technologies in the short and long term and recommends it for their friends, family members and other social surroundings. A little is known about the impact of users' behavioral intention on satisfaction with 3G mobile phone. Li and Yeh [15] examined the factors affecting behavioral intention, trust and satisfaction among 3G users in Taiwan. Integrating TAM model and service quality dimensions, they found that perceived ease of use, perceived usefulness, interactivity, customization and responsiveness significantly influenced the users' satisfaction with 3G mobile, whereas users' satisfaction significantly influenced the users' trust and behavioral intention. Use-diffusion patterns (specialized, non-specialized, intense and limited users) were found to be different in terms of their satisfaction with 3G mobile service [16]. A correlation was found between satisfaction with 3G mobile with demographics such as gender, age, education and family income [24]. Although direct impact of behavioral intention towards satisfaction is limited to descriptive statistics, this study posits:

H5a: Behavioral intention positively influences the students' satisfaction with 3G mobile technology.

H5b: Gender significantly moderates the effects of behavioral intention on the students' satisfaction with 3G mobile technology.

H5c: Age significantly moderates the effects of behavioral intention on the students' satisfaction with 3G mobile technology.

Methodology

Research Sample: This study was conducted in SIMAD University, a private university in Mogadishu, Somalia. This university has been selected for its focus on technology related subjects. By using stratified random sampling, a total of 500 questionnaires were distributed to the students from all faculties and levels of study. The main strata were based on gender and faculty. Three hundred and ninety five (N=395) usable questionnaires were analyzed after eliminating incomplete ones (n=23). Of these, 70 percent were males and 30 percent were females. Less than fifty percent were at third year of their study; about two-thirds were between 18-23 years.

Data Analysis: Data collection was conducted in July 2013. Statistical Package for Social sciences (SPSS) version 17 was used for data key-in, reliability and exploratory factor analysis was employed for the pilot test; whereas Amos version 18 was used to test the hypothesized model, confirmatory factor analysis and structural model.

Instrumentation and Measures: Prior to administering the questionnaires, it was pilot-tested with 30 students in order to assess its readability, understanding, time spent, clarity and reliability. The survey consisted of two sections; the first addressed the demographic information such as gender, age, level of study and marital status. The second section addressed the purposes of this study and collected students' responses regarding the main variables of the study. Six main constructs were addressed in this study, namely social influence, perceived expense, performance expectancy, effort expectancy, behavioral intention and users' satisfaction. These measures were adapted from previous studies.

Model Fit: Several goodness of fit statistics were employed to test the measurement and structural models using AMOS version 18. These fit statistics include chi square divided by degrees of freedom (Normed chi Square), comparative Fit index (CFI), Tucker-Lewis index (TLI), Goodness of Fit index (GFI), Adjusted Goodness of Fit index (AGFI), Root Mean Square Error Approximation (RMSEA) and Standard Root Mean Residual (SRMR). A good fitting model can be established when normed chi square is less than 3 [25], CFI and TLI are greater than .90 [26]; GFI and AGFI are more than .90; RMSEA and SRMR are less than .05 [27].

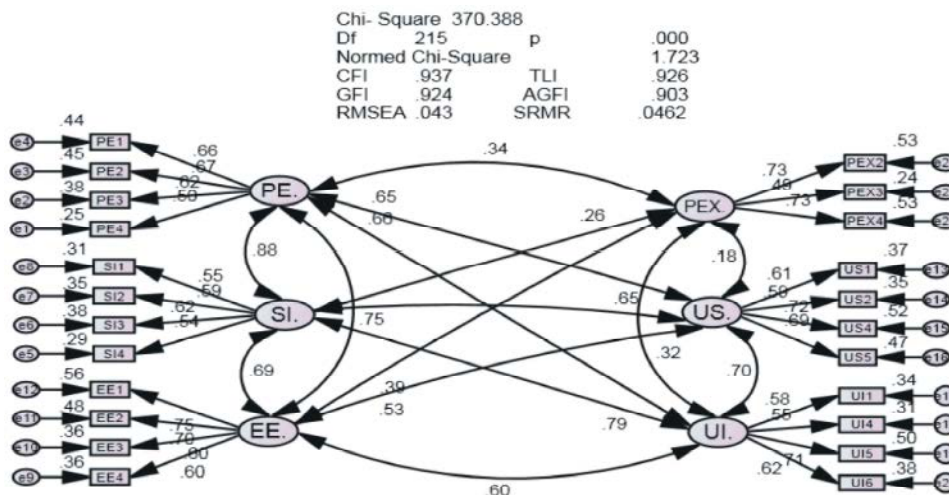


Fig. 2: Measurement Model

Findings

Measurement Model: Measurement model was conducted using confirmatory factor analysis with the maximum likelihood estimation procedure. The hypothesized measurement model consisted of six first-order factors. Four of them (social influence, effort expectancy, performance expectancy and perceived expense) comprised four items each, whereas users’ satisfaction and users’ behavioral intention were measured with five and six items respectively.

Initial measurement model did not fit well to the empirical data ($X^2/df=1.785$, $p=.000$, $CFI=.929$, $TLI=.917$, $GFI=.918$, $AGFI=.896$, $RMSEA=.045$, and $SRMR=.0490$) and subsequently was revised. User’s intention, perceived expense and users’ satisfaction were found to have two and one factor loading below the threshold of .50 [26] respectively. Therefore, they were dropped and excluded from subsequent analysis. As a result, the model fit statistics were entirely improved, indicating that the measurement model was sufficiently consistent with the empirical data ($X^2/df=1.723$, $p=.000$, $CFI=.937$, $TLI=.926$, $GFI=.924$, $AGFI=.903$, $RMSEA=.043$, and $SRMR=.0432$). Furthermore, the direction and magnitude of the relationships were assessed. It was found positive and significant relationships among the constructs under investigation, whereas all factor loadings were statistically significant and above the threshold of .50 (Hair *et al.*, 2010). All constructs were found to have internal consistency; the Cronbach’s alpha values were .703 for performance expectancy, .757 for effort expectancy, .693 for social influence, .709 for both perceived expense and users’ intention and .747 for users’ satisfaction.

Hypotheses Testing

Structural Model: After obtaining acceptable measurement model in terms of fit statistics, validity and reliability, the hypothesized model was assessed. The initial model suggested poor fit to the data; $X^2/df=11.882$, $p=.000$, $CFI=.941$, $TLI=.779$, $GFI=.964$, $AGFI=.808$, $RMSEA=.166$, and $SRMR=.0737$. Therefore, the model was revised by looking at modification indices suggestions. The revised model produced a good fitting to the empirical data, with $X^2/df=1.719$, $p=.000$, $CFI=.998$, $TLI=.985$, $GFI=.997$, $AGFI=.970$, $RMSEA=.043$, and $SRMR=.013$. It was found unexpected paths (direct impact) between social influence and users’ satisfaction and between performance expectancy and users’ satisfaction (Figure 3).

It was hypothesized (H1a) that performance expectancy would have significant effect on the students’ behavioral intention to adopt 3G technology. This hypothesis was fully supported by the empirical data ($\beta=.11$, $p<.05$). As well, it was found that effort expectancy (H2a, $\beta=.16$, $p<.05$); social influence (H3a, $\beta=.37$, $p<.05$) and perceived expense (H4a, $\beta=.11$, $p<.05$) had statistically significant effect on students’ behavioral intention to adopt 3G technology. In other words, students’ intention to use this technology was mainly determined by its expected performance, its easiness to use, social surroundings and its price. Social influence was the best predictor of the intention to use the technology followed by effort expectancy. In addition, behavioral intention (H5, $\beta=.35$, $p<.05$), in turn, significantly influenced the students’ satisfaction with 3G technology. It should be noted that it was found

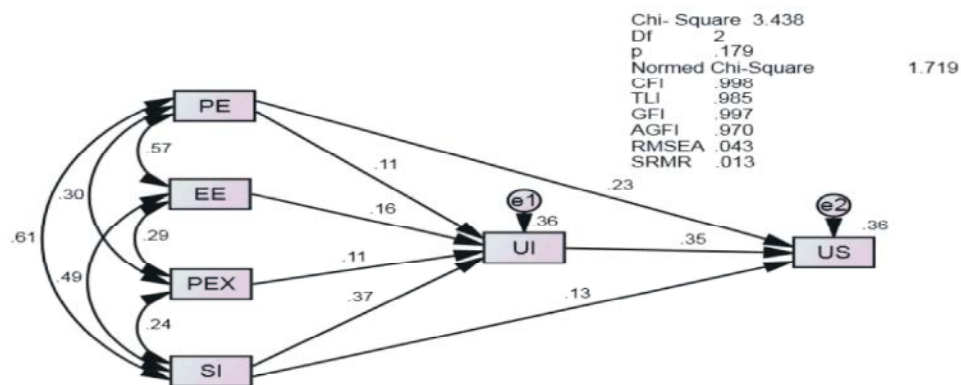


Fig. 3: Modified Hypothesized model

*All paths are significant at .05

Note: PE = Performance Expectancy; EE= Effort Expectancy; PEX = Perceived Expense; SI = Social influence; UI = User’s intention; and US = User’s Satisfaction

Table 1: Results of Structural Multiple Groups Modeling

	X ²	df	df difference	Critical value	X ² change	Invariant?
Gender						
Unrestricted	5.764	4	7	14.067	14.657	Yes
Constrained	20.421	11				
Age						
Unrestricted	12.357	4	7	14.067	11.657*	
No						
Constrained	24.014	11				

* Statistically significant at .05

unexpected paths during the analysis. Social influence ($\beta=.13$, $p<.05$) and performance expectancy ($\beta=.23$, $p<.05$) had direct effects on the students’ satisfaction with the service. All the four main predictors (social influence, effort expectancy, performance expectancy and perceived expense) managed to explain 36% of variance in behavioral intention, whereas social influence, behavioral intention and performance expectancy explained 36% of variance in students’ satisfaction with the service.

Structural Invariance: This was conducted in order to determine whether or not the model fit across gender and age of the students. In other words, it is to determine the moderation effects of gender and age on the causal relationships. Moderating effects of gender and age was conducted separately. First, concurrent analysis was conducted on the young ($n=231$) and older sub samples ($n=164$). Table 1 provides the results of group analysis.

The results of structural invariance analysis of age groups suggested a significant chi square. The chi square for the unrestricted model was 12.36 with 4 degrees of

freedom, whereas the chi-square for the constrained model was 24.01 with 11 degrees of freedom. When it compared it with the critical value, it was found that the chi-square difference was statistically significant at .05. This means that age variable significantly moderates the causal relationships. In other words, age interacts with the exogenous variables’ influences on the endogenous variables. Consequently, hypotheses pertaining age moderation (H1c, H2c, H3c, H4c, and H5c) were On the other hand, there was no gender moderating effect as the chi square difference was not statistically significant. It means that male and female students did not differ in their perceptions about the 3G technology. As such, all sub hypotheses regarding gender moderation were not supported.

DISCUSSION

Third generation telecommunication technology (3G) was widely adopted in Somalia in terms of individual and organizational levels. This study attempts to validate an

extended UTAUT model among students in a private university in the country. To achieve the objectives of the study, UTAUT model [8] was extended by incorporating two constructs tapping the nature of 3G technology: perceived expense and satisfaction with the service. Stratified random sampling was used and survey research design as data collection method. In addition, Structural equation modeling was employed for hypotheses testing and model fit.

The first hypothesis, which postulated that performance expectancy would have significant impact on the students' behavioral intention to use 3G technology, was fully supported. This is in line with previous studies [13, 17, 18, 19, 23], which found that the construct and its derivatives to be good predictors of 3G technology in different settings such as Taiwan, Turkey, China and Malaysia. Moreover, this study found age moderation on the impact of this construct on the students' intention. It means those different age groups perceive differently the usefulness of this technology. This supports the original model [8], but in contrast to a recent study [23]. However, no gender moderation was found regarding this relationship, which is contradictory to the original model.

The second hypothesis predicted significant impact of effort expectancy on the students' behavioral intention. This was fully supported and in line with prior research on the subject [13, 17]. In other studies [18, 19], it has been found that effort expectancy and perceived ease of use had no effect on behavioral intention to use 3G mobile technology among Taiwanese and Chinese consumers respectively. As for the moderation effects, age variable significantly moderated the causal relationship, whereas gender did not demonstrate any effect on hypothesized relationship. This supports partially the theory and contrary to other studies.

The third hypothesis that posited that the social influence would have significant effect on the students' intention was also supported by the data. This is also supported by the literature [8, 10, 19, 20, 22]. Age was significant moderator in the causal relationship between social influence and behavioral intention, whereas gender did not influence this relationship. Venkatesh *et al.* [8] found age and gender to be moderators, while other studies [i.e., 23] found these variables to be non-significant as moderators.

The fourth hypothesis was about the possible impact of perceived expense on the students' intention to adopt 3G technology. The results demonstrated support for this hypothesis. Moreover, the literature [13, 20-22] suggested that perceived expense and other similar concepts such as perceived cost, price and perceived price were significant

predictors of 3G technology in several countries (China, Malaysia, Taiwan, and Turkey).

The last hypothesis, which suggested a significant influence of behavioral intention on the students' satisfaction with the service, was fully supported. The students' intention, probably their continuance intention, determines their satisfaction with the service. Students' willingness to continue the service and recommending to others strongly demonstrates a kind of satisfaction. Furthermore, age group moderation was found in this regard, whereas gender did not moderate the relationship between behavioral intention and satisfaction.

CONCLUSION

This study found several factors which determine the intention and satisfaction of the students with 3G technology. Among these factors, social influence was found to be the best predictor, followed by effort expectancy. It means that the students' friends, lecturers, or family members have higher impact on their perception about the service. If they recommended, students are more likely to adopt it and in turn, recommend for others.

This study contributed to the literature on 3G technology in three unique ways. First, it extended the existing studies on 3G adoption to the Somali context by examining the factors underlying the students' adoption and satisfaction with this new technology in the country. Second, this study extended theoretical understanding of the UTAUT model by incorporating two essential elements in 3G technology literature: perceived expense and satisfaction. Third, very limited studies addressed the satisfaction with this technology. Behavioral intention was found to have predictive explanation on the students' satisfaction with the satisfaction.

Moreover, the study provides useful implication for both telecommunication industry and Hormuud Telecom in particular. Telecommunication industry should consider several factors if they are willing to provide services like 3G technology to the students' population. They have to take into consideration the easiness and user friendly feature of the service as well as the social surroundings which have much influence on the students. Majority of the students agreed that learning how to operate 3G technology was easy for them. In addition, students believed that the total cost of 3G adoption is expensive. This calls for policy adjustment for different target populations. Since the students are dependent on their parents for tuition fees and other expenses, the company may introduce a new policy regarding a discounted price for the students.

Finally, this study demonstrated several limitations regarding sampling frame and theoretical perspective. First, this study is only generalizable to the students in SIMAD University. It is suggested for future research to expand the sample to other universities by following the same sampling procedure. This can provide more understanding of the influential factors underlying the adoption and satisfaction with the service. The second limitation concerns the mediation and moderation effects. This study did not address the mediating effects of the behavioral intentions on the relationship between the predictors and satisfaction. Furthermore, the study did not look the moderating effects of experience and voluntariness as suggested by the theory. Therefore, by examining these effects in future research will provide better understanding and support for the theory.

ACKNOWLEDGMENT

We would like to extend our gratitude to the staff and students of SIMAD University for their collaboration during the data collection period. We are also grateful to Prof Mohamad Sahari Nordin, Institute of education, IIUM, for the constructive comments and input during the analysis of the study.

REFERENCES

1. Zhuang, L., C. Xiaoyan and D. Yan, 2009. Mobile learning applied research based on 3G technology. Paper presented at Seventh ACIS International Conference on Software Engineering Research, Management and Applications. 2-4 December 2009, Haikou, China.
2. Abu, S.T., 2010. Technological innovations and 3G mobile phone diffusion: Lessons learned from Japan. *Telematics and Informatics*, 27(4): 418-432.
3. Hussein, A., 2013. Mobile customers gain access to 3G technology in Mogadishu. Accessed online March 17, 2013.
4. Osman, H.M., 2013. Telecom: Somalia's success industry. Accessed online on March 17, 2013.
5. World Factbook, 2012. Communications: Somalia. Accessed online on June 5, 2013.
6. Baidaomedia, 2013. Telecommunication development of Somalia and its challenges. Accessed online on March 25, 2013.
7. Mohamed, M., 2013. In Somalia, new telecommunication technologies play important role. Accessed online on April 19, 2013.
8. Venkatesh, V., M.G. Morris, G.B. Davis and F.D. Davis, 2003. User Acceptance of Information Technology: Toward a Unified View. *MIS Quarterly*, 27(3): 425-478.
9. Oshlyansky, L., P. Cairns and H. Thimbleby, 2007. Validating the unified theory of acceptance and use of technology (UTAUT) tool cross-culturally, In D. Ramduny-Ellis and D. Rachivides (Eds.), *Proceedings of the HCI 2007*, 2: 83-86. (Online).
10. Venkatesh, V. and X. Zhang, 2010. Unified theory of acceptance and use of technology: U.S. Vs. China. *Journal of global information technology management*, 13(1): 5-27.
11. Liao, C., C. Tsou and M. Huang, 2007. Factors influencing the usage of 3G mobile services in Taiwan. *Online Information Review*, 31(6): 759-774.
12. Lu, J., Lui, Change, C. Yu and K. Wang, 2008. Determinants of accepting mobile data services in China. *Information and Management*, 45(1): 52-64.
13. Ong, J., Y.S. Poong and T.H. Ng, 2008. 3G services adoption among university students: Diffusion of innovation theory. *Communications of the IBIMA*, 3: 114-121.
14. Kou, Y. and S. Yen, 2009. Towards an understanding of the behavioral intention to use 3G mobile value-added services. *Computers in Human Behavior*, 25(1): 103-110.
15. Li, Y. and Y. Yeh, 2009. Service quality's impact on mobile satisfaction and intention to use 3G service. *Proceedings of the 42nd Hawaii International Conference on System Sciences*. Accessed online on March 29, 2013.
16. Jin, Y. and Z. Li, 2011. A use-diffusion model of 3G service in China. *African Journal of Business Management*, 5(27): 11168-11177.
17. Suki, N.M., 2012. Third generation (3G) mobile service acceptance: Evidence from Malaysia. *African Journal of Business Management*, 6(15): 5165-5171.
18. Chong, A.Y., K. Ooi, B. Lu and K. Bao, 2012. An empirical analysis of the determinants of 3G adoption in China. *Computers in Human Behavior*, 28(2): 360-369.
19. Wu, Y., Y. Toa and P. Yang, 2007. Using UTAUT to explore the behavior of 3G mobile communication users. Paper presented at Industrial Engineering and Engineering Management, 2007 IEEE International Conference on, 2-4 December, 199-203. Accessed online on 17 April, 2013.
20. Mardikyan, S., B. Bepiroğlu and G. Uzmaya, 2012. Behavioral Intention towards the Use of 3G Technology. *Communications of the IBIMA*. Accessed online on June 3, 2013.

21. Teng, W., H. Lu and H. Yu, 2009. Exploring the mass adoption of third-generation (3G) mobile phones in Taiwan. *Telecommunications Policy*, 33(10-11): 628-641.
22. Zhenyu, C. and D. Huiying, 2011. An empirical study of consumer adoption of 3G value-added services in China. Paper presented at management and service sciences international conference, 12-14 August, 2011, accessed online 3 June, 2013.
23. Jambulingam, M., 2013. Behavioral intention to adopt mobile technology among tertiary students. *World Applied Sciences Journal*, 22(9): 1226-1271.
24. Golden, S.A.R. and V. Gopalakrishanan, 2013. subscriber's satisfaction towards 3G service in Tamil Nadu with special reference to Tuticorin city-analysis. *Indian Streams Research Journal*, 3(1): 1-10.
25. Kline, R.B., 2011. Principles and practice of structural equation modeling. New York: The Guilford Press.
26. Hair, J.F., W.C. Black, B.J. Babin and R.E. Anderson, 2010. *Multivariate data analysis*. Pearson Prentice Hall.
27. Schumacker, R.E. and R.G. Lomax, 2010. *A beginner's guide to structural equation modeling*. New York: Routledge.