Examining the Intervening Role of Age and Gender on mobile payment Acceptance in Ghana: UTAUT Model

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ABSTRACT

The internet is by far one of the novel technologies that has shaped and supported all human endeavors. The phenomenal growth of the internet has been the backbone to the development of other cutting-edge technologies of which mobile payment is not an exception. The emergence of wireless technology and smartphones has brought to consumers an extraordinary way of carrying out day-to-day activities. These mobile and smartphones technology have become the driving force of many businesses today. Mobile payment provides ubiquity and offers a very convenient way for consumers to conduct transactions anytime and anywhere over wireless telecommunications networks. The sole intention of this study was to examine the moderating effects of age and gender on electronic payment based on the Unified Theory of Acceptance and Use of Technology (UTAUT) theoretical model. Using a sample of 1098 respondents, we collected and analysed the data by employing regression. The results confirm that "performance expectancy", effort expectancy for male respondents were higher than the mean for female respondents while the mean score of the variable for social influence for female is higher than the male respondents. On the other hand, the findings statistically concluded that the moderating effect of age was significant.

Key words: UTAUT, Mobile Payment, Ghana, Gender, Age

INTRODUCTION

Today, it is not business as usual anymore. The dynamics of doing business have changed by contemporary technological innovativeness such as the internet, mobile devices, social media and many more. These technologies have changed the payment landscape in businesses. Since the mobile phones emerged, quite a number of consumers have resorted to online buying. According to statista (2017) report, global mobile payments hit $450 billion in 2015 and it is projected to exceed $1 trillion by 2019.

Mobile payment is one form of e-payment that has garnered a lot of plaudits in recent times. Industry players deem mobile payment as a game changer in the telecommunication industry as revealed by (Ghezzi et al. 2010; Ondrus et al. 2009). In Ghana, mobile payment has gathered a lot of momentum over these few years it emerged (Kumaga 2011; SALIU 2015). Mobile payment service is operated

by all the major telecom companies in Ghana - MTN, Vodafone, Tigo and Airtel (Frempong et al. 2001).

The introduction of mobile money has opened up Ghana's telecommunication space (Kumaga 2011). According to (BoG 2016) report, mobile money grew by 106.66 percent with a transaction volume of 121.5% from 2012 to 2016.

With reference to Liébana-Cabanillas et al. (2014) mobile payment is an activity involving an electronic device with connection to a mobile network enabling the successful completion of an economic transaction initiated by an individual or business. Wikipedia, the world's renowned digital library defined mobile payment as payment services operated under financial regulation and performed from or via a mobile device. The high penetration rate of mobile devices like the mobile phone in Ghana has consolidated the popularity of mobile payments. Ghana's mobile users stood at 127.63 per cent as a result of 35 million voice subscription base in 2015 (NCA 2017). According to NCA (2017) report, total

mobile data subscription reached 22,103,467 with 77.58 per cent penetration rate.

It therefore mainly consists of the completion of payments and transactions between two parties in a fast, convenient, safe, and simple way, anytime and anywhere, using a mobile device. This payment system presents several advantages for companies and users when compared to alternative payment systems in e-commerce (point-of-sale). Significant advantages for companies and vendors include among others: increased versatility, considering the large number of existing mobile phones, faster transactions, greater convenience, time-saving, and lower costs (lower discount rates), etc. (José Liébana-Cabanillas et al. 2014). The mobile phone has led to a profound revolution in our society because of its social and economic impact (Ghezzi et al. 2010; Manvi et al. 2009; Zhao 2007), although it is also considered to be a business in expansion (Ramfos et al. 2004). At the present time, we could actually consider it to be a growing activity and one of the future payment tools (Holzer et al. 2009; Ondrus et al. 2006). Over the years, a number of technology adoption and acceptance models have emerged. These theoretical models have been tested and validated in many field of study such as IS and others (Chau 1996; Davis 1989; Venkatesh et al. 2000). Chiefly among these theoretical models is TAM which has been used to investigate IT/IS acceptance in many fields of endeavor. Ideally, classical TAM is meant to provide the theoretical foundation for realizing the influence of external constructs on internal beliefs, attitudes, and intentions. Perceived usefulness and perceived ease of use presumably believed to be the crust of constructs of TAM that influences technology adoption. With reference to TAM, it is assumed that perceived usefulness and perceived ease of use forms the basis for users' attitudes toward using a particular technology which cascades to intention to use, and consequently triggers actual usage behavior. Davis (1989) surmised that perceived usefulness is the extent to which a person believes that using a system would enhance his or her job performance whereas perceived ease of use refers to the extent to which a person believes that using a system would be free of personal efforts. However, the original TAM model was created to examine IT/IS adoption in business organizations. The model's suitability for predicting general individual acceptance, especially in higher education, needs to be explored. Venkatesh et al. (2003) developed the Unified Theory of Acceptance and Use of Technology (UTAUT) model to consolidate previous TAM related studies (see Figure 1). In the UTAUT model, performance expectancy

and effort expectancy were used to incorporate the constructs of perceived usefulness and ease of use in the original TAM study. Although the UTAUT model posits that the effort expectancy construct can be significant in determining user acceptance of information technology, concerns for ease of use may become non-significant over extended and sustained usage. Therefore, perceived ease of use can be expected to be more salient only in the early stages of using a new technology and it can have a positive effect on perceived usefulness of the technology. Moreover, the UTAUT model attempts to explain how individual differences influence technology use. More specifically, the relationship between perceived usefulness, ease of use, and intention to use can be moderated by age, gender, and experience. For example, the strength between perceived usefulness and intention to use varies with age and gender such that it is more significant for male and younger workers. The effect of perceived ease of use on intention is also moderated by gender and age such that it is more significant for female and older workers, and those effects decrease with experiences. The UTAUT model accounted for 70 percent of the variance in usage intention, better than any of TAM studies alone. Although UTAUT provides great promise to enhance our understanding of technology acceptance, the initial UTUAT study focused on large organizations. In addition, the scales used in UTAUT model are new as they are in combination of a number of prior scales, and therefore, the suitability of these scales needs to be further tested. The UTAUT states that user demographic factors such as gender and age are important moderators between the relationship of user acceptance, the dependent and independent variables (Venkatesh et al. 2003). Other studies found that the adoption of m-commerce is influenced by gender, age, income, work, family structure and marital status (Min et al. 2008). While a study found an important relationship between user demographics and user acceptance of m-commerce (Min et al. 2008).

In relation to gender, previous studies used the TAM to examine gender difference between men and women to understand the adoption and use of technology in an organizational context. Evidence indicates women were affected more by technologies ease of use than men (He et al. 2010; Riquelme et al. 2010).Other studies have indicated that females are less likely to adopt and use technology than males. The reason behind these finding indicate that females are usually more hesitant than males to engage and adopt new technologies and even choose a future career that is related to technology (Pan et al. 2010; Wong et al. 2012). In addition, the theory of trying

was used to study the work environment, gender, and user's ability to innovate with information technology (Ahuja et al. 2005). However, other studies have conflicting findings. Studies indicate that with time females are adopting and accepting new technologies more than the past, where they are embracing technology usage such as personal computers and its applications at work and home (Downes 2002; Haddon 2006). Concerning e-commerce and gender differences studies show that men are more prone to purchase products online than women (Kukar-Kinney et al. 2012; Slyke et al. 2010). While other studies performed a detailed review of gender and e-commerce, activities that also resulted in mixed findings. Given the contradictory finding stated above it is important to investigate gender differences and its relationship with new technology adoption, specifically m-commerce, as it is the new trend of wireless technology that is rapidly growing. Therefore, the following research hypotheses are examined:

> *H1a: There is no significant difference between the effect of performance expectancy on e-payment system adoption on male and female users*
>
> *H1b: There is no significant difference between the effect of effort expectancy on e-payment system adoption on male and female users*
>
> *H1c: There is no significant difference between the effect of social influence on e-payment system adoption on male and female users*
>
> *H1d: There is no significant difference between the effect of facilitating conditions on e-payment system adoption on male and female users*

In relation to age, it was found that young women positively accept m-commerce more than older women (Koenigstorfer et al. 2012; Yousafzai et al. 2012). Other studies also examined the age factor among users to understand user acceptance and adoption of m-commerce (Hernández et al. 2011; Kim et al. 2010; Yousafzai et al. 2012). Age was also examined as an important predictor of user use of m-commerce (Chong 2013). Among several demographic factors age was found to be the most important predictor of m-commerce adoption (Chong et al. 2012). Age was also examined in relation to the intention to shop online, and the study showed mixed findings (Forsythe et al. 2003). In addition, studies that examine the relationship of age to the adoption

of m-commerce among university students are somewhat rare. Therefore, the following research hypotheses are proposed:

> *H2a: Younger respondents are more likely to be influenced by performance expectancy than elderly respondents in the adoption of e-payment systems*
>
> *H2b: Younger respondents are more likely to be influenced by effort expectancy than elderly respondents in the adoption of e-payment systems*
>
> *H2c: Older respondents are more likely to be influenced by social influence than younger respondents in the adoption of e-payment systems*
>
> *H2d: Older respondents are more likely to be influenced by facilitating conditions than younger respondents in the adoption of e-payment systems*

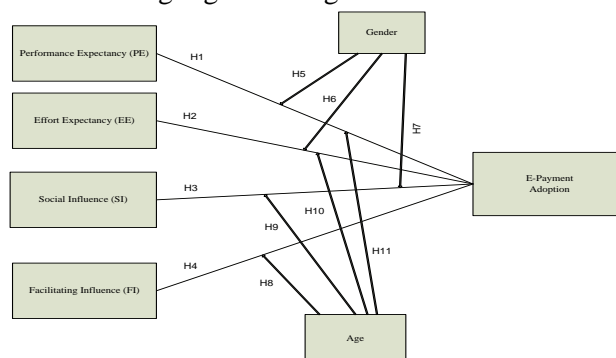The framework that is expected to be tested in this research is highlighted in figure 1

Figure 1.1: Theoretical Model

Literature Review

In every socio-economic setting, there are certain characteristics that can be used to assess the population for statistical reasons. These demographic characteristics permeate various human endeavors. Some typical demographic factors include race, education level, gender, age, income, marital status and others. Age and gender as demographic factors have been used severally to ascertain how people adopt and use a new technology. At this point, an empirical study on the age and gender was carried out to establish their moderating relevance pertaining to this study.

To begin with, Liébana-Cabanillas et al. (2015) in their study sought to understand the moderating effect of age on adoption of new mobile payments systems. An integrated theoretical framework was proposed to establish the practical importance of

mobile payment system while measuring the relative role of age of users in a digital environment. To analyse the behavioural intentions towards new mobile payment system in an electronic environment, a general population sampling size of 2,012 was used. The sampling criteria method was premised on a web based experiment was carried out. Existential outcome emanated from the study depicts that age of potential users causes significant differences in the intended relationship existing between subjective rules and the facility of use and confidence. To further expatiate on the general outcome of the study, it was revealed that users with younger age are very susceptible to accept new technology systems vis-à-vis older folks who are not easily coerced to accept new technology but rather need higher inferences of the service. These older folks are therefore swayed by subjective rules in the users setting. This further suggests that older folks have string linkages between subjective rule and the facility of use. Again, young users exuding a lot of experience exhibit more confidence in a new technological system than older users. Pertaining to subjective rule and facility of use constructs, it came out that older users like to use a simple and easy technological tool which is very different from younger users. The relationship between subjective and confidence showed that young users exhibit more trust in a system which is a reverse of their older users. Finally, the resultant association of confidence and facility of use and attitude among young users is very strong and rife.

One major innovative technology that has rocked the financial sector is Internet banking which allows customers' convenience and time to transactions through the web. Its adoption has become very momentous. A study conducted by Safeena et al. (2014) explored the influence of perceived benefit (PB), perceived impediment (PI), social influence and moderating effect of demographic factors like gender and age on IB adoption. Employing questionnaire in analyzing data, the outcome portrays a positive effect on social influence and PB whiles Perceived Impediment had no significant measure on the use and acceptance of internet banking. Accordingly, the outcome suggests a moderating effect of age and gender on internet banking.

Jaradat et al. (2014) conducted a study on mobile commerce in an Arabian country specifically Jordan where TAM3 was used as theoretical model. The study investigated TAM3perceived usefulness and perceived ease of use to explicate users intentions toward mobile commerce adoption. The moderating effect of gender difference on mobile commerce was considered in the study. A questionnaire type of data collection method was used to source data from 14 private universities from Jordan with 425 valid sample size data used in the analysis. The study pointed out that perceived and perceived ease of use are constructs that relates well with user's intention to use mobile commerce. Further, it came out that individualism-collectivism at the user level values on mobile commerce adoption is positively significant. Surprisingly, the moderating effect of gender was not realised in the adoption process. Another study by Alduaij et al. (2016) empirically investigated student's perceived benefits and perceived barriers of utilizing m-commerce on the backdrop of student demographic characteristics such as gender, age, year of study, and college of study that moderate students adoption decisions of m-commerce. Quantitative method based on a questionnaire type of data collection was employed to source data from 1000 students. Initial outcome on gender revealed that male students perceive more benefits in dealing with m-commerce than their female counterpart. On age factor, the results show that students in the age bracket of 17-19 exudes more affection towards m-commerce than those who are in the age bracket of 20.

Ifinedo (2016) carried out a study that sought to examine the moderating effect of age and computer knowledge on nurses' acceptance of information systems with TAM as the theoretical model. TAMs two cognitive constructs (perceived ease of use and perceived usefulness) together with age and computer knowledge were tested. Using 197 registered nurses based on a cross-sectional survey as the data collection method, the study employed PLS of SEM to analyze the usable data. Ultimately, the findings revealed that computer knowledge positively moderates perceived ease of use (PEOU) and perceived usefulness on nurses' attitude toward information systems. However, surprising as it may be, demographic determinant of age did not have any significant effect on perceived ease of use and perceived useful leading to nurses' attitude to use information systems. The findings further prove the significant importance of age to both academicians and practitioners in discussions related information system acceptance at the work place.

Customer's behavioural intention towards hotel tablet applications was tested using the constructs of perceived ease of use, perceived usefulness, credibility and subjective norm. The study further examined the moderating effects of age and gender and how they relate with the factors that influence customer's intention and likelihood of using custom application function that permeates age and gender. In this study carried out by Kim et al. (2016), data

was sourced from 751 customers who patronize hotel services in the United States. Data collected was analysed based on confirmatory factor analysis and structural equation modeling. The result confirmed that three of the constructs used in the study had a positive influence customers' behavioral intention toward hotel tablet apps. However, gender and age fell short of moderating any potential linkages between the constructs and their behavioural intention. Again, the results revealed differing preferences towards hotel application functions based on age and gender.

In an integrative TAM study incorporating three moderating determinants of age, gender and education Al-Gahtani et al. (2007) investigated and test TAMs applicability in an Arabic setting by sourcing data from 722 knowledge workers who voluntarily use desktop computer applications. The moderating effects of age and gender were also considered. The outcome saw the salient relationships pertaining to the model being moderated. Perceived ease of use and perceived usefulness were moderated by age with regards to usage of computer applications but gender only moderated perceived ease of use regarding attitude to desktop computer applications.

Social media is now considered by most people as the convenient communication channel today especially the younger generation. On the background of this assertion, Acheampong et al. (2017) carried out study on generation Y behavior towards computer mediated communication tools modeled on UTAUT 2 proposed by Venkatesh et al (2012). 1823 tertiary students' were sampled from 15 Universities using a question based of data collection method base on UTAUT 2. The results suggested that females were more inclined to use computer mediated communicated tools as compared to their opposite gender. It was also deduced that young people between the ages of 18-25 are more likely to use computer mediated communication tools vis-à-vis their elderly counterparts.

Many people are using the internet now. People surf the web for many purposes like reading the news, streaming live videos, buying online and many more. The diffused nature of smart phones has made this possible since it is internet enabled. On this background Li et al. (2014) sought to know the influencing determinants of mobile data flow service adoption. The study used UTAUT model proposed by Venkatesh et al. (2000) with 537 Chinese nationals as respondents. Data sourced from the respondents were analyzed with structural equation model. The findings proved that effort expectancy and social influence has significant effect on behavior intention to use mobile phone data flow service. The study in addition employed regression model to validate any potential linkages of age and gender on the constructs enshrined in the UTAUT model. According to the results, the moderating effect of age was evident in situations where facilitating condition affected effort expectancy, and education level has the positive moderating effect when social influence affects behavior intention toward using mobile phone data flow service. However, gender recorded no significant effect on these constructs. The study of Li et al. (2014) offers strong proposition that inure to the appreciation of mobile phone data flow service adoption behaviors.

Lu et al. (2003) conducted a study that sought to understand user's age and gender disparity based on their decision on wireless mobile data services in China. Using a dataset of 1432 as respondents in five undisclosed cities in China, the data sourced was analysed using structural equation model and hierarchical multiple regression procedures. The result suggested that differences in age and gender had an express control relating individual's decision to adopt wireless mobile data services (WMDS) in China. Again, it was deduced that gender alone had a minimal influence with respect to an individual's premonition towards wireless mobile data services (WMDS) in the study area. Further, both age and gender had minimal control on potential associations relating to WMDS adoption.

Payment of goods and services has today become very convenient. This has become possible because technological innovations. This innovation technology which is referred to as mobile money is being driven by telecommunication industries. Many studies have been conducted on users adoption of technology and mobile money transfer services is no exception. For instance, Marumbwa (2014) work on MMTs examined the moderating effects of socio-demographic determinants of age, gender and other variables. Data was sourced from 350 usable respondents using a survey. According to the results age and gender had a negative influence on users' acceptance of mobile money transfer services whereas education levels and employment status recorded a positive impact.

Kang et al. (2014) study investigated the extent to which the perceived usefulness, perceived ease of use, perceived enjoyment and social influence of smart phones affected word of mouth, as well as the moderating role of customer socio–demographic characteristics. Data were collected through a cross–sectional survey of 481 South Korean smart phone consumers. The results indicated that perceived

usefulness, perceived ease of use and social influence affected word of mouth. Moreover, hierarchical regression analyses confirmed that the effect of perceived enjoyment on word of mouth was moderated by customer gender, age and education. Finally, the relationship between perceived ease of use and word of mouth was moderated by gender. These results suggest the need to design targeted smartphone marketing strategies that consider users' gender, age and education.

Consumers have become sophisticated and much impatient today. They need convenient and reliable banking services. Ghalandari (2012) study on e-banking services exploited the effects of performance expectancy, effort expectancy, social influence and facilitating conditions on acceptance of e-banking services in Iran while considering the moderating effects of age and gender. With 350 hard copy questionnaires shared to prospective clients, 310 were used as the sample size and consequently use in the analysis. The findings corroborated performance expectancy, effort expectancy, social influence and facilitating conditions positively influenced users' behavior and intention to use e-banking services. On the other hand, age and gender moderated the linkages between the four variables.

Li et al. (2008), explored the difference between male and female with regards to the acceptance and use of mobile commerce with 372 respondents drawn from a college in Northeast United States. Initial response from respondents no differences with adoption rate hovering around 30 percent. The constructs of perceptions of price, ease of use, and usefulness proved significantly positive between adopters and non-adopters rather than gender. Males and females showed the same high magnitude inclination towards m-commerce entertainment services with communication and information services following in that order. The study concluded that males are early adopters of technology than their female counterparts.

Attitudes towards the acceptance and use of technology at the work place have proved to be very important in this current dispensation. In view of this, many research works have been carried out to validate this claim more especially on demographic characteristics like age, gender etc of the workforce. For instance, the work of Elias et al. (2011) examined the potential connection that may exist between age and attitudes towards technology. With age as a moderating determinant, 612 employees' predisposition to technology based on their intrinsic and extrinsic work motivation and job satisfaction were explored. Sample data was collected on two generational groups – Gen X and baby boomers using a hierarchical moderated multiple regression. Results indicate that age moderates the relationship between attitude towards technology and intrinsic motivation, extrinsic motivation, and to a lesser extent, overall job satisfaction. Furthermore, the findings support the argument that older employees demonstrate the strongest connection with the outcome variables when possessing a high attitude towards technology and vice versa.

Adopting two culturally diverse countries in their study, Heinrichs et al. (2016) touched on the moderating effects of gender with respect to driving forces that derails e-tail website use. The result predicted a favourable moderating effect of gender coupled with e-shoppers relationships. The study admonished businesses to tailor their marketing towards males and females.

Adapting Reid's pioneering Perceptual Learning Style Preference Questionnaire (PLSPQ), Lee et al. (2016) carried out a research work that probed any potential connections of University students' learning styles and the use of computer technology for language learning. Again, any potential disparity with respect to demographic effects of age and gender considered. 401 students between the age group 17-35 years were sampled from two universities using a survey as a data collection instrument. The eventual findings reports that no gender disparity was recorded in technology application and learning styles - visual, auditory, kinesthetic, and tactile. However, there was a slight age differences pertaining to kinesthetic and tactile styles but not in technology use.

Suki (2014) research work examines the moderating role of gender in the relationship between hotel service quality dimensions and tourist satisfaction with hotel service delivery. The study portrayed a positive moderating effect of gender and its connection with service quality dimensions and tourist satisfaction with hotel service delivery. Moreover, the study proved that concerning satisfaction men and women respond differently.

A research conducted by Janda (2008) consolidates other research works that have been conducted pertaining to online consumer behavior. The study investigates four major online concerns expressed by consumers - security, privacy, credibility and virtual experience. It was discovered that although security and virtual experience have negative effect on the probability of consumers to purchase online, women were more concerned about the probable effect of privacy and information credibility that can hamper their purchasing intentions online as opposed to men. Research works that precedes this study have modified TAM by employing additional variables to

the overall TAM theoretical framework. Teo et al. (2017) extension of TAM introduced constructivist and traditional conceptions emanating from teachers' conceptions of teaching and learning. On the other hand, age, gender and other demographic variables were tested. Both age and gender could not moderate the relationship between the constructs and teachers' conception to teaching and learning.

Online purchasing intention by consumers can be attributed some psychological factors. It must be noted consumers have differing attitude and behavioral intentions towards purchasing online. Cho et al. (2008) empirically explored the demographic effect of age on consumer's attitude to online buying on the purview of emotional expectations, trust, and self-efficacy. A survey type of data collection was employed to source data from 120 netizens devoid of gender restrictions. Consequently, emotional expectations trust, and self-efficacy recorded significant influence on consumer's attitude towards Internet commerce irrespective ones gender orientation. On the contrary, it was revealed that females exhibit low levels of trust and self-efficacy with respect to Internet commerce as opposed to male consumers. Creating more positive insights towards online purchasing requires learning and managing the pervasive gender disparity which is very key electronic retailers.

Riquelme et al. (2010) explored the determinants of mobile banking among customers in Singapore while emphasizing on gender as moderating determinant. A sample of 600 existing customers were used as respondents who expressed their views on their intention to use mobile banking, perceptions of relative advantage of the mobile device, perception of risk, social norms, ease of use and usefulness of the device for banking purposes. Data was analyzed by using SEM where it was confirmed that usefulness, social norms and social risk emerged as stronger variables that manipulate intention to adopt mobile banking. Ease of use has a stronger influence on female respondents than male, but relative advantage has a stronger effect on perception of usefulness on male respondents. Social norms (or the importance of others in the decision), also influence adoption more strongly among female respondents than male.

Kang et al. (2014) evaluated probable connection existing between perceived usefulness, ease of use, and enjoyment and attitude toward tablet computers. The researchers explored the relationship between social influence and use intentions for such devices with gender and age as moderating factors. 481 consumers were analyzed from South Korea using Partial least squares. It was found out that perceived

usefulness and enjoyment have a positive effect on attitude toward tablets, while social influence and attitude toward tablet computers have a positive influence on intention to use tablets. Furthermore, gender and age moderated the affiliation between perceived ease of use and attitude toward tablets.

The explosive rise of wireless technology coupled with high penetration mobile phones has caused financial institutions spending more on mobile banking systems. However, the effort of banks to expand their mobile banking systems has not received the commensurate rate of adoption by users'. In view of this, Yu (2012) attempted to study the behavioral intentions towards the adoption of mobile banking based on the UTAUT theoretical model. Yu (2012) sampled 441 usable respondents. The result affirmed significant importance of social influence, perceived financial cost, performance expectancy, and perceived credibility, in their order of influencing strength. On the other hand the study confirmed the moderating effects of age and gender performance expectancy and perceived financial cost on behavioral intention, and the age considerably moderated the effects of facilitating conditions and perceived self-efficacy on actual adoption behavior. In a study conducted by Lian et al. (2014) paid attention to the internet use by older adults since prior studies have only focused on youth. The researches sought to understand the drivers and barriers affecting older consumers' intention to shop online while incorporating UTAUT into innovative resistance theory. The outcome juxtaposed younger consumers with the older counterparts. The findings discovered that, the variables that drive older adults to shopping online are performance expectation and social influence which is similar with the younger.

E-health technological innovations have recently inundated the operations of the health sector. These technologies have undoubtedly improved the service operations of health professionals which have also achieved some convenience for patients. Although this has become a new phenomenon its determining factors remains shrouded. Using a scenario technique Arning et al. (2009) assessed the role of technology type and how it contradicts with central application characteristics. 104 respondents were used in this study using questionnaire data collection method while measuring their individual demographic factors that relate to attitude concerning e-health applications. According to the result, the effects of age and gender reveal some differences on e-health acceptance. It was established that older users submitted favourable approval ratings to the system.

MATERIALS AND METHODS

The study adapted but modified items or indicators of technology adoption based on the UTAUT model. As indicated in previous sections, user demographic factors such as gender and age are important moderators between the relationships of user acceptance (Venkatesh et al. 2000). We consulted other studies that found that the adoption of some types of technology (e.g. m-commerce) is influenced by gender, age, income, work, family structure and marital status (Bigné et al. 2007; Pedersen 2005; Wu et al. 2005) and other demographic factors. All of these were collated into a questionnaire made of 44 questions including the demographic information. A sample of 1098 respondents was recruited from selected cities in all the ten regions of Ghana based on the accessible population. We measured all construct items on a seven-point likert-type scale (1-disagree strongly, 7-agree strongly). We tested for validity of content of the questionnaires by rigorously pre-testing on appropriate sample (within the population but outside the final sample) to refine the wordings.

We self-administered the final questionnaires to respondents in their respective locations through the assistance of research assistants that were recruited and trained by the researchers. We performed a two staged statistical analysis to obtain the results. Firstly, we determined the appropriateness of the data for factor analysis by employing Kaiser–Meyer-Olkin measure of sampling adequacy (KMO-MSA) and Bartlett's Test of Sphericity. We recorded a KMO value of more than 0.60 and a significant value for the Bartlett's Test of Sphericity. We then performed factor analysis to investigate the technology adoption dimensions as represented in the UTAUT model after which we formulated an optimal scaling regression model to examine the general effect of all the four factors on e-payment adoption. We thoroughly verified the basic assumptions i.e. the constant variance and normality and these did not affect the results. We performed Varimax rotation and principle components analysis for factor analysis. We eliminated all the factors that had factor loadings lower than 0.50 after which we conducted the Cronbach's alpha reliability analysis. We ensured that all measure of sampling adequacy exceeded the Cronbach's alpha reliability value threshold level of 0.70 and large and significant Bartlett's Test of Sphericity. We eliminated all items that had a factor loading lower than 0.50.

Descriptive statistics were used to draw up a respondent profile, by comparing mean scores, analysing mean differences and defining the extent to which mean scores either fall below or exceed the Likert scale's midpoint. To test the

hypotheses, optimal scaling regression analyses was carried out using the following model.

$Y = \alpha + \beta_1 X_1 + \dots \beta_4 X_4 + e$
- α = origin of regression line or the intercept
- B = the coefficient of regression
- Y = Average score of being stress or not
- $X_{1\dots}$ Predictor Variables

To account for moderator variables, a split group regression analyses are carried out. This test allows determining whether the proposed moderator variables attenuate the relationship between attitudes and adoption intentions. Thus a split group analysis between male respondents and female respondents as well as respondents lower than 45 years of age and those above 45 years of age was conducted for each of the categories. Consistent with the extant literature, gender moderated was evaluated for performance expectancy, effort expectancy and social influence. On the other hand gender was moderation on facilitating condition, effort expectancy, social influence and performance expectancy were conducted based on prior studies. ANOVA tests are executed to test whether there are significant differences between age and gender groups. To test if the ANOVA results indicate significant differences, Post Hoc tests, based on the Scheffe procedure, are conducted to see where the significance lies.

RESULTS AND ANALYSIS

Moderator Variable	Group	R²	Beta	P	Significance Level
Gender					
	Male	.494	.703	0.000	P<0.001
	Female	.668	.817	0.000	P<0.001

Table 1 Regression Results

Table 1 indicates the results of the split regression output of the effect of gender on intention to use e-payment in Ghana. The analysis indicated that both male (P<0.001) and female (P<0.001) have a significant effect on the use of e-payment in Ghana.

		Sum of Squares	df	Mean Square	F	Sig.
Performance Expectancy	Between Groups	4.363	1	4.363	4.001	.026
	Within Groups	246.434	229	1.077		
	Total	241.917	230			
Effort Expectancy	Between Groups	1.329	1	1.329	.492	.024
	Within Groups	616.640	229	2.701		
	Total	619.969	230			
Social Influence	Between Groups	2.374	1	2.374	1.142	.014
	Within Groups	471.960	229	2.061		
	Total	474.344	230			
Facilitating Condition	Between Groups	1.413	1	1.413	.772	.360
	Within Groups	416.621	229	1.629		
	Total	420.234	230			

Even though "performance expectancy", effort expectancy for male respondents were higher than the mean for female respondents while the mean score of the variable for social influence for female is higher than the male respondents, the

ANOVA test results in table 2 show that there is no significant difference between the influence of performance expectancy (p=.026) and effort expectancy (p<.024) and social influence (p<0.014) in the adoption of e-payment system on male and female respondents. In the same regard, no statistically significant difference is seen in respect of facilitating conditions between male and female respondents. The analysis therefore rejects hypothesis 1a that the intention to use e-payment is more likely to be influenced by performance expectancy in men than in women. Similarly, hypothesis 1b is also rejected because there is no significant difference in the effect of effort expectancy on e-payment adoption by male and female users. The analysis also rejects hypothesis 1c because male respondents were not more influenced by social influence to adopt e-payment than female respondents. Finally hypothesis 1d is also rejected because facilitating conditions are not more influential on men than women when it comes to adoption of e-payment system.

Moderator Variable	Group	R^2	Beta	P	Significance Level
Age	Less than 45	.666	.816	0.000	P<0.001
	More than 45	.214	.463	0.013	P<0.04

Table 1.6: Summarised data output

Table 2 indicates the results of the split regression output of the effect of age on intention to use e-payment in Ghana. The analysis indicated that both respondents younger than 45 years old (P<0.001) and those older than 45 years old (P<0.003) have a significant effect on the use of e-payment in Ghana.

		Sum of Squares	df	Mean Square	F	Sig.
Performance Expectancy	Between Groups	31.344	4	6.269	6.394	.000
	Within Groups	220.472	224	.960		
	Total	241.917	230			
Effort Expectancy	Between Groups	44.746	4	10.949	4.349	.001
	Within Groups	464.223	224	2.412		
	Total	619.969	230			
Social Influence	Between Groups	40.726	4	6.146	4.227	.001
	Within Groups	433.626	224	1.927		
	Total	474.344	230			
Facilitating Condition	Between Groups	36.393	4	7.679	4.424	.001
	Within Groups	361.641	224	1.697		
	Total	420.234	230			

The analysis shows that "performance expectancy", effort expectancy for respondents younger than 45 years old was higher than the mean for respondents older than 45 years old while the mean score of the variable for social influence and facilitating conditions for respondents older than 45 years old is higher than for respondents younger than 45 years old. The ANOVA test results in table 4 follows consistently with this significance of difference. For example, there is a significant difference between the effect of performance expectancy and effort expectancy for respondents younger than 45 years old and those older than 45 years when it comes to adoption of e-payment system. This means that

hypothesis 2a and 2b are accepted in this research. In the same regard hypothesis 2c and 2d are also accepted because there is a significant difference between social influence and facilitating conditions and e-payment adoption in Ghana and all of these are statistically significant.

CONCLUSIONS AND IMPLICATIONS

Despite the fact that several studies did not find a significant influence of demographics (Dabholkar et al. 2002; Meuter et al. 2003; Reinders et al. 2008), in technology adoption, and concludes that age and gender for example are no important contributors towards e-payment adoption, this study proves the opposite. The results imply that as far as age is concerned, there are significant differences between different age groups. These findings are especially valuable, since it could have been argued that the increasing access to and acceptance of e-payment technology in various service settings reduced or erased these differences. Thus considering the significant differences between age groups, any e-payment system development should consider such demographic characteristics. Even though the study does not find support for the effect of gender attributes, it is possible that other external factors may play a role in moderating the intention to use and actual use of e-payment systems in Ghana. Thus future research must explore the effect of cultural differences and its likely effect on e-payment system adoption.

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