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Influence of performance expectancy on commercial farmers' intention to use mobile-based communication technologies for agricultural market information dissemination in Uganda

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Abstract

Purpose – This paper to examine the relationship between performance expectancy and behavioural intention to use mobile-based communication technologies for agricultural market information dissemination in Uganda.

Design/methodology/approach – A descriptive field survey method was adopted. A total of 302 commercial farmers and agribusiness traders in Eastern Uganda participated in the study from whom data were collected using self-administered questionnaires. Descriptive statistics, factor analysis, correlation and regression analyses were used in the study.

Findings – The findings reveal a significant positive relationship between performance expectancy and behavioural intentions to use mobile-based communication technologies for agricultural information access and dissemination. This implies that, commercial farmers' behavioural intentions to use mobile-based communication technologies for agricultural market information dissemination and access will be influenced if they anticipate mobile-based communication technologies to offer greater performance in their daily transactions.

Research limitations/implications – This study was conducted in the context of resource constrained countries particularly in sub-Saharan Africa, however reflecting knowledge from other contexts. The study was conducted with a structured questionnaire being the main data collection tool, and this limited the study from collecting views outside the questions asked in the questionnaire. The variables studied could not be analysed for a long time, given that the study was cross-sectional in nature.

Practical implications – The study provides recommendations on how to further boost farmers' behavioural intentions to use mobile-based communication technologies for agricultural information dissemination. Policy makers need to ensure that policies are put in place that encourage third party software developers and telecommunication companies to provide software products and solutions that are beneficial to the commercial farmers and can enable them complete their agricultural transactions in time.

Social implications – The study provides critical literature on the influence of performance expectancy on commercial farmers' behavioural intentions to use mobile-based communication

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technologies for agricultural market information access and dissemination in resource constrained settings.

Originality/value – It is noted that farmers in Uganda are slowly progressing to newer mobile information and communication technology tools for market information access and dissemination; however, little is known as to why there is slow adoption of these mobile technologies for agricultural purposes; yet policy makers need to come up with proper strategies to encourage wide scale use of mobile technologies for agricultural market purposes.

Keywords Agricultural information dissemination, Behavioural intentions to use, Mobile-based communication technologies (MBCTs), Performance expectancy

Paper type Research paper

Introduction

Agriculture in many resource-constrained countries like Uganda is a great contributor in the fight against poverty, especially among the rural poor as reported by Ministry of Agriculture (2010). According to Masuki *et al.* (2010), the agricultural sector is contributing up to 20 per cent to the gross domestic product of Uganda, and so far, it is able to provide both formal and informal employment to over 73 per cent of the Uganda population in the sector. Therefore, to achieve an improvement in the livelihood as well as the economic growth resulting to alleviation of poverty levels in Uganda, emphasis and resources are being availed in the sector so as to improve the performance of agriculture.

Information and communication technologies (ICTs) have greatly impacted on several sectors in many economies both in developing and developed countries. According to Maumbe (2010), ICTs are continuously being deployed in many sectors including education, health, banking, e-government, tourism and the trend continues as well to the agriculture sector. Studies have indicated that ICTs are playing a great role in improving the performance of agriculture (O'Donnell, 2013; Fu and Akter, 2011; Stienen *et al.*, 2007). Katengeza *et al.* (2011) asserts that commonly used mobile technology tools such as mobile phones' SMS applications, internet/Web-based applications, interactive video can be used as modern information sources in many sectors of developing countries. Information for agriculture is a very important tool in agricultural marketing, and in the developed world, farmers have been able to gain access to timely and accurate agricultural market information (Kizilaslan, 2006). Agricultural market information includes pricing information for agricultural products, information on weather, crop advisory, fertilizer availability and updates on government schemes, information on new technology, information on better farming practices and better management (Nyareza and Archie, 2012; O'Donnell, 2013). According to (Mohammadi *et al.*, 2011), having access to up-to-date and accurate agricultural information is key to improving on the productivity and marketing efforts of farmers. With the right information at the right time, farmers are able to make informed decisions on which products to produce, where to sell their products, what prices to charge and when to sell their farm products thereby avoiding exploitation from the intermediaries.

However, in many resource-constrained countries like Uganda, farmers are still faced with challenges in accessing agricultural market information, despite the existence of ICT tools and especially mobile technologies (Masuki *et al.*, 2010). Farmers are faced with constraints such as use of intermediaries/middlemen to get market information and end up exploited (Masuki *et al.*, 2010), and the lack of information on opportunities for

value-addition and accurate information on pricing their produce is either generally lacking or hard to get (Katengeza *et al.*, 2011). This according to Miwanda *et al.* (2014) and O'Neill (2010) is partly attributed to the poor adoption and under-utilization of mobile ICT tools. Farmers in Uganda are slowly progressing to newer mobile ICT tools for market information access and dissemination, and little is known as to why there is slow adoption of these mobile technologies for agricultural purposes (Katengeza *et al.*, 2011); yet policy makers need to come up with proper strategies to influence farmers intentions to adopt and encourage wide scale use of mobile technologies for agricultural market purposes Masuki *et al.* (2010) argue that there is slow adoption of mobile ICT tools because farmers have yet to identify the performance benefits of using ICT tools in agricultural marketing thus relying on traditional means of agricultural marketing. According to Katengeza *et al.* (2011), adoption of these new ICT tools is based on whether farmers perceive them to be beneficial and profitable in use, and clearly, their adoption is a choice between the traditional and new technologies.

The study therefore sought to examine the significance of performance expectancy (PE) on influencing commercial farmers' behavioural intention to use mobile-based communication technologies (MBCTs) for agricultural information access and dissemination. This study is relevant because it provides critical literature on the influence of PE on commercial farmers' behavioural intentions to use MBCTs for agricultural information access and dissemination in Uganda. It has been noted by researchers such as Park *et al.* (2007) that there is need to test constructs in the IT adoption and acceptance models in different cultural settings in this case Uganda, given that these constructs such as PE play a significant role in impacting IT acceptance.

Literature review

Government initiatives for agricultural development in Uganda

Uganda in its efforts to eradicate poverty and drive growth is looking up to the agricultural sector, given that it employs up to 75 per cent of the total labour force (Marini, 2013). To achieve agricultural development, several initiatives have been adopted and among them are partnerships with NGOs and the private sector, plan for modernization of agriculture (PMA), establishment of the National Agricultural Advisory Services (NAADS) among others.

According to Okoboi *et al.* (2013), the NAADS program is a 25-year public-funded private sector-contracted extension system that is being implemented in phases with the first phase having started in July 2001 and ended in June 2010. The second phase started in July 2010 and ended in June 2015. This program according to the authors was initially designed to build the capacity of farmers to form and operate farmer associations, demand advisory services and adopt improved agricultural technologies and practices.

The PMA was launched in 2001 to support poverty eradication through the transformation of the agricultural sector. This program based its efforts and activities upon two fundamental principles; that agriculture is critical for poverty reduction and that the development of the sector is dependent upon multi-sectoral interventions hoped to bring about transformation of the agriculture sector (Joughin and Kjær, 2010).

Rural Development Strategy was formulated with an aim of facilitating profound agrarian productivity, given that the government had always wanted to improve on the rural areas, as majority of the population live there with rural-based livelihoods. The strategy had basically three main objectives: increase farm productivity of selected

commodities produced by households, increase household outputs of selected agricultural products and promote value-addition and ensure a stable market for these agricultural products (Monitoring African Food and Agricultural Policies, 2013).

The government of Uganda has partnered with several NGOs such as Community Integrated Development Initiatives (CIDI) and IFAD to develop the agricultural sector. CIDI was founded as a legal Non-Governmental Organization with a direct need for concerted efforts in fighting poverty in Uganda. CIDI's actions have been directed at offering development services and contributing to improve lives of, especially, the disadvantaged in the society. Its promotion of sustainable agriculture is geared towards developing capacity, skills and technologies, for improved food security and sustainable environment among farmer communities (CIDI, 2012).

IFAD has partnered with the government and has successfully implemented several projects for agricultural development such as Community Agricultural Infrastructure Improvement Programme, Rural Finance Services Programme, Area-Based Agricultural Modernization Programme, Agricultural Development Project, Agricultural Technology and Agribusiness Advisory Services (ATAAS) Programme, among others (Marini, 2013).

Therefore, MBCTs can as well enhance on the achievement of the government initiatives with some of them stated above. Initiatives such as NAADS can benefit from these technologies, given it is a public extension system to help farmers. Most of the mentioned initiatives have objectives related to poverty reduction/eradication, increasing on agricultural productivity, as well as improving on farmers' household incomes (Okoboi *et al.*, 2013). With the utilization of the MBCTs, the above-mentioned objectives can be attained.

Mobile-based communication technologies/services used in agricultural information dissemination

According to O'Donnell (2013), the present modern mobile phone technologies such as smartphones and tablets are able to offer or deliver better services that can be used in agricultural information access and dissemination. Services such as voice and SMS platforms, custom-made mobile/Web applications and social media platforms can offer better marketing strategies to commercial farmers. Social media platforms such as Facebook, Twitter, WhatsApp, LinkedIn among others are also said to be growing in their usage in Africa (Banks, 2012; O'Donnell, 2013). Custom-made mobile/Web applications according to O'Donnell (2013) include but not limited to Google Docs, Google Trader, mFarm and farmforce which are mobile apps for agricultural marketing. These MBCTs are reported to offer great benefits to commercial farmers such as finding new buyers, using market information to obtain higher prices, better traceability and compliance with quality and safety standards (O'Donnell, 2013).

Benefits of using mobile communication technologies for agricultural marketing

First and foremost, ICTs such as the mobile phone through its different communication platforms such as social media, SMS, Voice, among others contribute to easy and faster access to information necessary for decision-making by the farmers and traders. Mbiti (2010) argues that mobile phones improve access to and use of information leading to reduction in search costs, better coordination among agents and increased market efficiency. This has had a great impact on market prices of agricultural products which

Nakasone *et al.* (2014) agrees upon. However, Burrell and Oreglia (2012) states that literature on evidence of the direct impact of ICTs (mobile phone) on prices of agricultural products is unsatisfactory, and the core question of how information may be linked to productivity, income and market efficiency and economic development is still an active research in this area, living a gap that needs to be addressed so as to clearly understand ICTs impact on prices of agricultural products and its relation to improved efficiency in agricultural productivity.

Mobile-based ICTs have enabled farmers to easily access and locate markets for their farm produce at a reduced search cost. Market links have been created for farmers and entrepreneurs, and trade networks have been broadened; mobile applications that enable provision of market information and electronic trading platforms for farmers to access information on prices and identity of their buyers have been created (Munyua *et al.*, 2008). This therefore improves on the efficiency of the farmers and timeliness of conducting their agricultural activities hence increasing on their productivity.

Nakasone *et al.* (2014) also clearly states that there is a big contribution of mobile ICTs to agricultural extension services in developing countries. According to Cole and Fernando (2012), agricultural extension service agents/workers are plunged with several constraints limiting their efficiency. These constraints include poor infrastructure limiting extension workers visits, institutional problems as well as accountability. For which Cole and Fernando (2012) point out the use of mobile ICTs as a solution to these problems, given that the cost of extension visits is reduced, a more frequent two-way communication between farmers and agents is made possible and agents' accountability is also improved.

Relationship between performance expectancy and behavioural intention to use

PE has been defined by Venkatesh *et al.* (2003) as the degree to which someone believes that using a particular technology will help to enhance his or her job performance. Particularly, this study looks at PE as the degree to which a farmer believes that using mobile communication technologies for agricultural marketing information dissemination will lead to faster access to accurate information. In his studies however, Jambulingam (2013) defined PE as the degree to which an individual believes that the perceived usefulness of using a particular mobile technology will assist in improving his performance. Therefore, he looked at PE as being related to perceived usefulness in the previous adoption models studied. According to Ghalandari (2012), PE came as a result of five factors from previous models, and these include perceived usefulness which is derived from the technology acceptance models, external motivation derived from the motivational models, job fit which belongs to the PC utilization model, relative advantage from the innovation diffusion theory and finally outcome expectations which is derived from the social cognition theory.

According to Madara (2013), PE is in position to affect a user's satisfaction only if his expectation is confirmed by the product and therefore, PE in a technology product increases on the user's continuous intention to use; hence, it is most likely to impact on the user's behavioural intention to use mobile communication technologies. Behavioural intention to use is referred to as an individual's decision to exhibit a particular behaviour in the future. It is also argued that once the strength of a behavioural intention to conduct an act is greater, then it is more likely that such an act will be conducted in the future (Alotaibi *et al.*, 2013). Several studies conducted (Malima *et al.* 2015; O'Neill, 2010) have

supported Venkatesh *et al.*'s (2003) studies on technology adoption arguing that PE is found to uniquely, significantly and positively influence one's behavioural intension to accept and use mobile technologies in agricultural marketing. Therefore, examining the influence of PE on behavioural intentions to use helped to understand the factors that influence commercial farmers to use MBCTs for agricultural market information dissemination. This study is relevant given that Venkatesh *et al.* (2003) encouraged that future research applies and examines the applicability of the Unified Theory of Adoption and use of Technology (UTAUT) constructs in different contexts.

Research design

A cross-sectional field survey research design was adopted in the study, and thus quantitative research techniques (self-administered questionnaires) were used during data collection. A cross-sectional field survey research design was used, given that researchers are able to collect data on beliefs, practices or situations from a random sample of subjects in the field using survey questionnaires which is most frequently used (Bhattacherjee, 2012). A pilot study was carried out, and questionnaires were tested for reliability and validity prior to the survey. The questions tested for validity where presented on a five-point likert scale of (1 = Not relevant, 2 = Somewhat relevant, 3 = Quite relevant, 4 = Relevant and 5 = Very relevant). Content validity index (CVI) was used to test for validity which according to Polit *et al.* (2007), a CVI of 0.6 and above is acceptable. The pilot study test results for reliability also indicated that the questionnaire items analysed using Cronbach's alpha coefficient were found to have a coefficient of 0.70 and above which according to Nunnaly (1978) is acceptable in research. Table I presents the results of the pilot study.

A sample size of 384 respondents was chosen for the study using purposive sampling, and 302 of these responded back recording a response rate of 78.6 per cent which is adequate enough (Roscoe, 1975). Data were coded, cleaned, analysed and then presented in the tables. The study used descriptive statistics, factor analysis and correlation and regression analyses. According to Janssens *et al.* (2008), descriptive statistics is important because it provides a simple way of presentation of results, and it is easy to understand the results when presented. Factor analysis was used because it helps in studying the structure or relationships between variable factors and also reducing on the number of variable factors based on their commonalities, whereas correlation and regression play an important role in establishing the nature and strength of relationship between the study variables.

Ethical considerations

As the research involves human subjects, there is need to pay attention to ethics. Participants were asked to participate freely, and they were assured of confidentiality and privacy of their information. Hence, the participants were treated with dignity and not just as mere objects of study but rather with respect as human beings.

Variable tested	No. of items	CAC	CVI
Performance expectancy	4	0.72	0.62
Behavioural intentions to use	3	0.70	0.73

Table I. Reliability and validity statistics

Consent. Prior to data collection, the participants were asked to give their consent if they are willing to participate in the study. This was done to ensure that there is no coercion on the part of the participants.

Confidentiality. The participants were assured of confidentiality implying that each participant's information was kept private and confidential. The participants did not write their names on the questionnaires which further gave assurance of their confidentiality.

Voluntary participation. As stated earlier, participation was on voluntary basis, with participants being very free to withdraw their participation at any stage of the study without loss of benefits. Participants were not to be paid to participate in this study. This aims at ensuring that they participated voluntarily and gave information at their own free will.

Findings

District where farming is carried out

Data related to the respondents' districts of farming were collected, examined and later analysed using frequencies and percentages as seen in Table II.

Results in Table II reveal that most respondents were from Soroti District (Freq = 69, 23 per cent). This was followed by respondents from Jinja District (Freq = 65, 22 per cent). A total of 59 respondents constituting 20 per cent were from Iganga District. Only 58 (19 per cent) and 51 respondents (17 per cent) were from Mbale and Busia Districts, respectively.

The above results thus indicate that most of the commercial farming and agribusiness trade is reported to take place in Soroti District followed by Jinja District, Iganga District, Mbale and Busia being the least district.

Age of the farmers

Data were collected to examine the respondents age and analysed using frequencies and percentages as seen in Table III.

Results in Table III reveal that most respondents were aged 31-40 years (Freq = 92, 30.5 per cent). This was followed by respondents aged 26-30 years (Freq = 88, 29.1 per cent). A total of 57 respondents constituting 18.9 per cent were in the age bracket 41-50 years. Only 41 (13.6 per cent) and 24 respondents (7.9 per cent) were aged 18-25 years and 51 years and above, respectively.

The above results indicate that the most active farming age group is 31 to 40 years followed by 26 to 30 years and 41 to 50 years, respectively. On the other hand, the least active farming age group is 18 to 25 years followed by 51 years and above, respectively.

Table II.
District of farming

District	Frequency	(%)
Jinja	65	21.5
Iganga	59	19.5
Busia	51	16.9
Mbale	58	19.2
Soroti	69	22.8
Total	302	100.0

Descriptive statistics for the study variable performance expectancy

Descriptive statistics for study variable PE was carried out using mean and standard deviation. Data were collected using a five-point Likert scale were where 1 = strongly disagree, 2 = disagree, 3 = not sure, 4 = agree and 5 = strongly agree. Results are presented in Table IV.

The results in Table IV indicate that the respondents agreed with the questions PE1 (mean = 4.33), PE2 (mean = 3.81), PE3 (mean = 3.77) and PE4 (mean = 3.90). This implied MBCTs can enable farmers to access and disseminate accurate and reliable agricultural market information in a very timely manner.

Performance expectancy factor analysis results

Exploratory factor analysis using principal component analysis and extracting items with factor loadings greater or equal to 0.3 was used. The most important questions used to measure PE were three in total, and they explained a 64.169 per cent of variance of PE as shown in Table V.

The results in Table VI. show that the commonalities for PE were closely ranging between 0.636 and 0.728, an indication of convergence of items that measured PE.

From the factor analysis carried out, the results indicate that the sample on PE was adequate, given that Kaiser–Meyer–Olkin measure of sampling adequacy (KMO = 0.758), Bartlett's test of sphericity (approx. chi-square = 426.730, DF = 6, Sig = 0.000), and a determinant of 0.240 was greater than 0.00001 (Field, 2009).

Descriptive statistics for the study variable behavioural intentions to use

Descriptive statistics for behavioural intentions to use was performed using mean and standard deviation. Data were collected using a five-point Likert scale were where 1 =

Age (years)	Frequency	(%)	Cumulative (%)
18-25	41	13.6	13.6
26-30	88	29.1	42.7
31-40	92	30.5	73.2
41-50	57	18.9	92.1
51 and above	24	7.9	100.0
Total	302	100.0	

Table III.
Age of the farmers

Code	Factor	Mean	SD	Meaning
PE1	I believe using MBCTs is time saving	4.33	0.504	Agree
PE2	I expect to access my agricultural product prices using MBCTs	3.83	0.778	Agree
PE3	I expect to disseminate my agricultural product prices using MBCTs	3.77	0.811	Agree
PE4	If I use MBCTs, I will increase my chances of getting accurate and reliable agricultural information	3.90	0.829	Agree

Note: Analysis $N = 302$

Table IV.
Descriptive statistics for performance expectancy

strongly disagree, 2 = disagree, 3 = not sure, 4 = agree and 5 = strongly agree. Results are presented in Table VII.

The results in Table VII indicate that the respondents agreed with the questions BIU1 (mean = 4.08), BIU2 (mean = 4.30) and BIU3 (mean = 4.25). This implied that farmers are willing to use MBCTs now and in future and would also recommend their friends to use these technologies.

Behavioural intentions to use factor analysis results

Exploratory factor analysis using principal component analysis and extracting items with factor loadings greater or equal to 0.3 was used. The most important questions used to measure behavioural intentions to use were three in total, and they explained a 70.770 per cent of variance of behavioural intentions to use as shown in Table VIII.

Table V. Component matrix for performance expectancy

Factor	Performance expectancy
I expect to access my agricultural product prices using MBCTs	0.853
I expect to disseminate my agricultural product prices using MBCTs	0.849
If I use MBCTs, I will increase my chances of getting accurate and reliable agricultural information	0.798
Eigen value	2.567
% of variance	64.169

Table VI. Commonalities for performance expectancy

Factor	Initials	Extractions
I expect to access my agricultural product prices using MBCTs	1.000	0.728
I expect to disseminate my agricultural product prices using MBCTs	1.000	0.721
If I use MBCTs, I will increase my chances of getting accurate and reliable agricultural information	1.000	0.636

Note: Extraction method: principal component analysis

Table VII. Descriptive statistics for behavioural intentions to use

Code	Factor	Mean	SD	Meaning
BIU1	I predict I would use MBCTs to access agricultural information	4.08	0.444	Agree
BIU2	I will recommend others to use MBCTs to access agricultural information	4.30	0.519	Agree
BIU3	I intend to continue using MBCTs to access agricultural information in the future	4.25	0.536	Agree

Note: Analysis $N = 302$

The results in Table IX show that the commonalities for behavioural intentions to use were closely ranging between 0.604 and 0.786, an indication of convergence of items that measured behavioural intentions to use.

From the factor analysis carried out, the results indicate that the sample on behavioural intention to use was adequate, given Kaiser–Meyer–Olkin measure of sampling adequacy (KMO = 0.672), Bartlett's test of sphericity (approx. chi-square = 292.524, Df = 3, Sig = 0.000), and a determinant of 0.376 was greater than 0.00001 (Field, 2009).

Normality test of the study variables using P-P plots and Q-Q plots and histograms

Normality tests for study variables PE and behavioural intentions to use were carried out using P-P plots and Q-Q plots and histograms. Normality was carried out because non-compliance of a set of data to the normal distribution makes all subsequent statistical tests such as F and t-statistics invalid (Hair *et al.*, 2010). The normal P-P plot and Q-Q plot for PE and behavioural intentions to use show data points on and close to the line of best fit which implies that the data are fairly normally distributed as shown in appendices particularly Figures A1, A2, A3, A4 and A5. The histograms in Figures A3 and A6 show that most of the data under PE and behavioural intentions to use in the histogram bars is below the normal curve, which indicates that the data are fairly normally distributed for both variables measured.

Table VIII. Component matrix for behavioural intentions to use

Factor	Behavioural intentions to use
I will recommend others to use MBCTs to access agricultural information	0.886
I intend to continue using MBCTs to access agricultural information in the future	0.856
I predict I would use MBCTs to access agricultural information	0.777
Eigen value	2.123
% of variance	70.770

Table IX. Commonalities for behavioural intentions to use

Factor	Initials	Extractions
I predict I would use MBCTs to access agricultural information	1.000	0.604
I will recommend others to use MBCTs to access agricultural information	1.000	0.786
I intend to continue using MBCTs to access agricultural information in the future	1.000	0.733

Note: Extraction method: principal component analysis

Correlation analysis of the study variables performance expectancy and behavioural intentions to use mobile-based communication technologies

A correlation analysis was done to establish the associations and nature of relationship between PE and behavioural intentions to use, and the results are presented in the Table X.

The results in Table X indicate that there was a significant positive relationship between PE and behavioural intention to use MBCTs for agricultural market information access and dissemination ($r = 0.408^{**}$, $p < 0.01$, beta = 0.268, sig.<0.01). This implied that PE influenced behavioural intention to use MBCTs for agricultural information access and dissemination.

Regression analysis of the study variables performance expectancy and behavioural intentions to use mobile communication channels

A regression analysis was also done to establish the strength of relationship between the two study variables of PE and behavioural intentions to use MBCTs for agricultural market information access and dissemination as shown in Table XI.

The results in Table XI reveal that PE significantly predicts behavioural intentions to use MBCTs with (Beta = 0.408, Sig = 0.000). This implies that there is a very strong relationship/association between the two variables, and therefore PE can significantly influence the behaviour of commercial farmers to use MBCTs for agricultural information access and dissemination.

Discussion of findings

The study sought to establish the relationship between PE and Behavioural intentions to adopt and use MBCTs for agricultural marketing information access and dissemination

The findings from this study indicate that there was a significant positive relationship between PE and behavioural intention to use MBCTs for agricultural market information access and dissemination. This implied that PE influenced behavioural intention to use MBCTs for agricultural information access and dissemination. Respondents in this study indicated that if they can access and

Table X.
Correlations results of performance expectancy and behavioural intentions

Variable	Performance expectancy	Behavioral intentions
Performance expectancy	1	0.408**
Behavioral intentions	0.408**	1

Note: **Correlation is significant at the 0.01 level (two-tailed)

Table XI.
Regression analysis coefficients

Model		Unstandardized coefficients B	Unstandardized coefficients Standard error	Standardized coefficients Beta	*t*	Sig
1	(Constant)	3.059	0.150		20.371	0.000
	Performance expectancy	0.290	0.038	0.408	7.737	0.000

Note: Dependent variable: behavioral intentions

disseminate accurate and reliable agricultural product prices and other information using MBCTs in a timely manner, then their behavioural intention to use these MBCTs for information access and dissemination is favoured.

These findings are in agreement with Malima *et al.* (2015) who argue that PE is found to uniquely, significantly and positively influence one's behavioural intension to accept and use mobile technologies in agricultural marketing. Alotaibi *et al.* (2013) also argued that once the strength of a behavioural intention to conduct an act is greater, then it is more likely that such an act will be conducted in the future.

The findings contribute to the UTAUT because they provide evidence of the influence of PE on commercial farmers' behavioural intentions to use MBCTs in a developing country context particularly Uganda where agriculture is the major backbone of the economy (Ministry of Agriculture, 2010). Indrawati and Kok (2010) argued that most countries respond differently to adopting new innovative technologies, and this difference is caused by the divergent macro-level economic indicators and the social-economic indicators in different countries. Venkatesh *et al.* (2003) also encouraged that future research should apply and examine the applicability of the UTAUT constructs in different contexts. Therefore, given that agriculture is a backbone of Uganda's economy, the authors were motivated to examine the influence of PE on commercial farmers' intentions to use MBCTs for agricultural market information dissemination.

Theoretical and practical implication of the study

The study's theoretical contribution is that it provides critical literature on the influence of PE on commercial farmers' behavioural intentions to use MBCTs for agricultural market information access and dissemination in resource-constrained settings. To practice, the study provides recommendations on how to further boost farmers' behavioural intentions to use MBCTs for agricultural information dissemination. Policy makers need to ensure that policies are put in place that encourage third party software developers and telecommunication companies to provide software products and solutions that are beneficial to the commercial farmers and can enable them complete their agricultural transactions in time.

Conclusion

The objective of this research was to investigate the relationship between PE and behavioural intentions to use MBCTs for agricultural market information access and dissemination. The results from this empirical study reveal that there was a significant positive relationship between the independent variables of PE and the dependent variable behavioural intentions to use an indication that PE has the ability to influence commercial farmers' behavioural intention to adopt and use MBCTs for agricultural information access and dissemination.

Recommendations

In this study, PE is seen as a strong and significant factor in influencing commercial farmers' behavioural intentions to use MBCTs for agricultural information access and dissemination in Uganda. Therefore, improving the functionality and the ease of use of these MBCTs might play a big role in influencing commercial farmers' behavioural intentions to use MBCTs for agricultural market information access and dissemination. Also, service providers should carry out nationwide sensitization campaigns on the

benefits of MBCTs in agricultural market information access and dissemination, given that accurate and reliable information can be accessed. This will improve on the intentions of commercial farmers to use MBCTs for agricultural transaction purposes.

Limitations of the study

This study was conducted in the context of resource constrained countries particularly in sub-Saharan Africa, however reflecting knowledge from other contexts. The study was conducted with a structured questionnaire being the main data collection tool, and this limited the study from collecting views outside the questions asked in the questionnaire. The variables studied could not be analysed for a long time, given that the study was cross-sectional in nature.

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Appendix 1

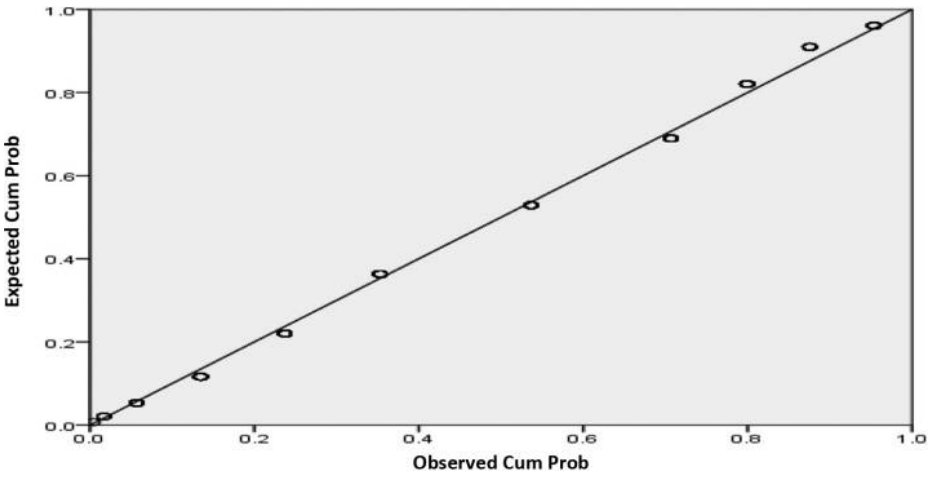

Figure A1
Normal P-P plot for PE

Appendix 2

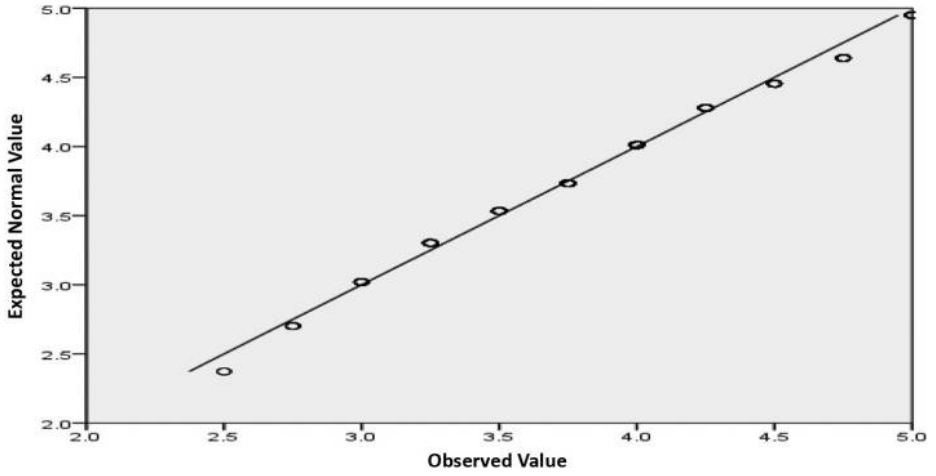

Figure A2
Normal Q-Q plot for PE

Appendix 3

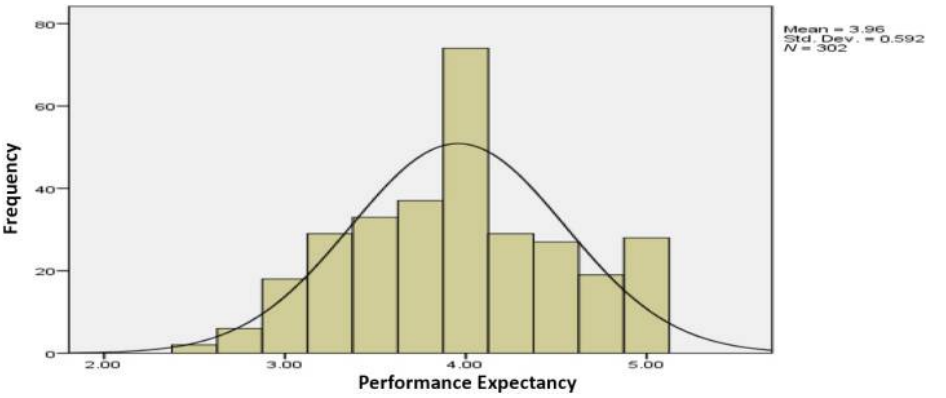

Figure A3
Histogram for PE

Appendix 4

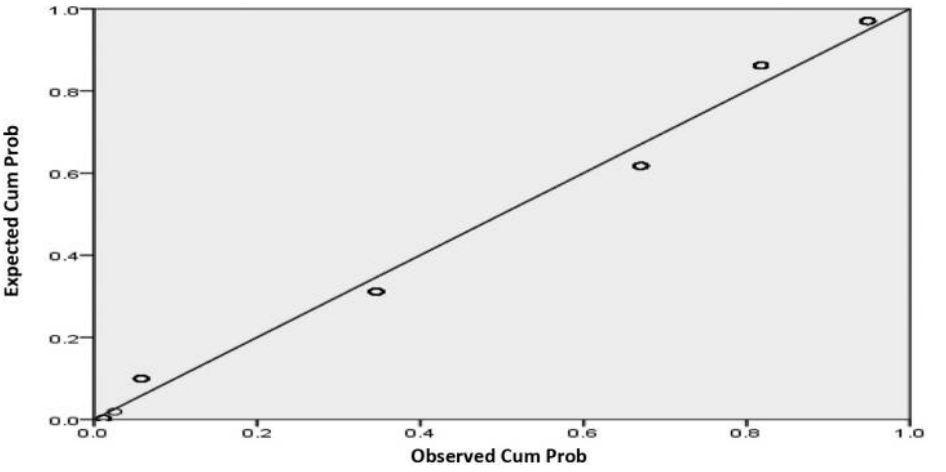

Figure A4
Normal P-P plot for behavioural intention to use

Appendix 5

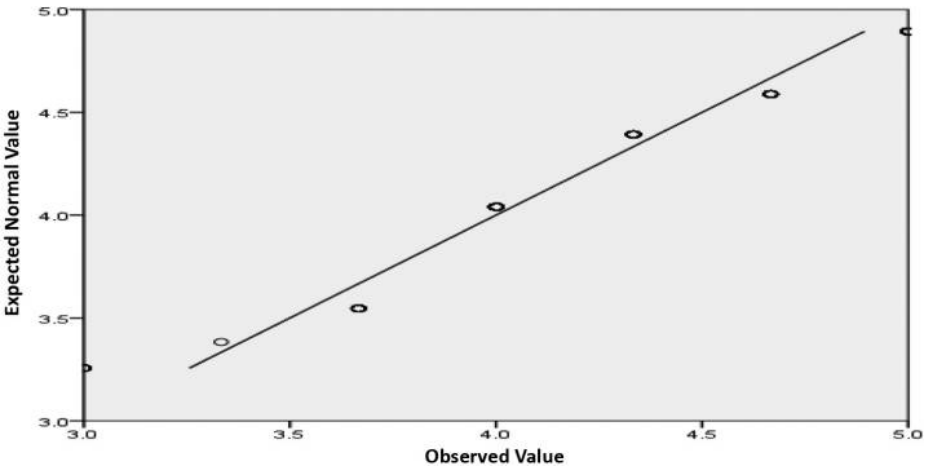

Figure A5
Normal Q-Q plot for behavioural intention to use

Appendix 6

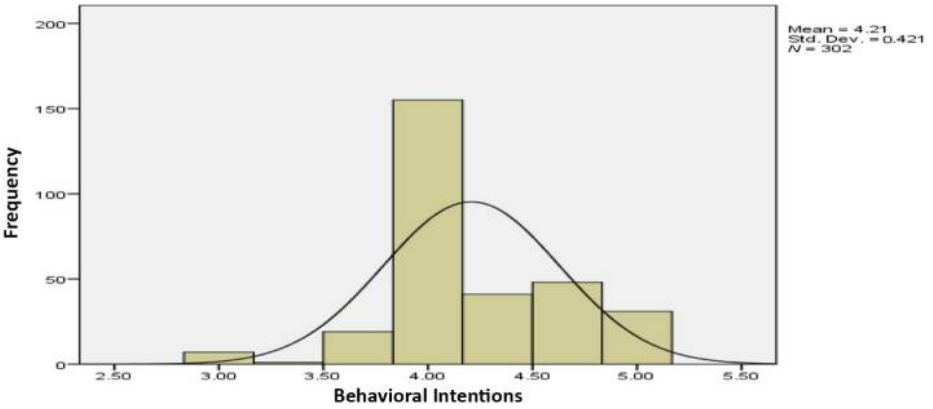

Figure A6
Histogram for behavioural intentions to use

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