

ICT Utilisation in Agric Based SMES in Akure South Local Government Area, Ondo State, Nigeria

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Abstract: The study examined the effect of ICT utilisation on the performance of Agric based SMEs in the study area. The study investigates the level of utilisation of ICT by Agric based SMEs in the study area. The study was carried out in Akure South Local Government Area of Ondo State, Nigeria. Questionnaires were used to collect primary data from 136 workers in agro based SMEs. Statistical packages for social sciences (SPSS) through frequency and percentages statistics will be used to analyse the demographic of the respondents while Partial Least Square Structural Equation Modelling (PLS-SEM) was used to examine the effect of ICT utilisation on the performance of Agric based SMEs in Akure south local government, Ondo State, Nigeria. This study finds that the beta values and the sig values of the independent variables, the beta value indicated that ICT utilization processes all made significant contributions to the performance of agro based SMEs in the study area. ICT application made the highest amount of contribution (.509), followed by ICT policy (.313), while ICT infrastructure made the least amount of contribution of (.185). Therefore, ICT utilization process; ICT application, ICT policy and ICT infrastructure all became significant at .000, .000 and .003 respectively. Finally, the study recommended among others that due to the significant positive effect that ICT utilization has on performance of SMEs, the Federal Government through the federal ministry of science and technology should support agro-entrepreneurial investors in order to expand the use and adoption of ICT by Agric based SMEs in the country.

I. INTRODUCTION

The modern economic environment which is dominated by globalization, hyper-competition, and knowledge and information revolution has revolutionized the way business is conducted (Davis, 2017). Today's business world has been deeply influenced by Information and Communication Technologies (ICT) and the application of ICT among business is widespread. ICT is rapidly changing global production, work and business methods and trade and consumption patterns in and between agricultural enterprises and the consumers (Davis, 2017). Denni (1996) emphasized that, every agribusiness owner must bring ICT into their business operation and take advantage of the benefits they offer. Denni (1996) further posits that information and communication technology (ICT) and e-business applications provide many benefits across a wide range of intra- and inter-firm business processes and transactions. According to Mutula and Brakel (2006), ICT utilisation improves information and knowledge management inside the firm and can reduce transaction costs and increase the speed and reliability of transactions for both business-to-business (B2B) and

business-to-consumer (B2C) transactions. In addition, they are effective tools for improving external communications and quality of services for established and new customers (Mutula & Brakel, 2006).

As the world economy continues to move toward increased integration as a result of advances in information communications technology, and the increasing reduction in trade barriers, some of the greatest opportunities for agric based small businesses will derive from their ability to participate in the regional and international markets Mpofu, Miline, & Watkins-Mathys, (2010). Utilisation of the ICT is considered to be a means to enable these businesses to compete on a global scale, with improved efficiency, and closer customer and supplier relationships (Chong, Pervan, & Bauer, 2001). In this respect, agric based SMEs should consider information and communication technology (ICT) as an important approach in their business. Moreover, ICT is an important resource to agribusinesses which may help them to access and contribute to in order to enhance its competitiveness (Shiels et al., 2003).

II. LITERATURE REVIEW

The Theory of Acceptance and Use of Technology (UTAUT) explains user's intentions to use ICT and the subsequent user behavior. UTAUT provides a useful tool to assess the likelihood of success for new technology introductions. UTAUT is also used to understand the drivers of acceptance in order to proactively design interventions targeted at populations of users that may be less inclined to adopt and use new systems (Venkatesh et al., 2003). The UTAUT model has advanced individual acceptance research by unifying the theoretical perspectives common in the literature and incorporating four moderators to account for dynamic influences including organizational context, user experience, and demographic characteristics (Venkatesh et al., 2003). Technology acceptance model (TAM) on the other hand suggests that the acceptance of an information system is determined by: perceived usefulness and perceived ease of use. Perceived usefulness is defined as the degree to which an individual believes that the use of an information system will improve performance. As demonstrated in the theory of reasoned action; the technology Acceptance Model is based on the belief that the use of an information system is determined by the behavioral intention, but on the other hand, that the behavioral intention is determined by the individual's

attitude towards the use of the information system and also by his perception of its utility. According to Davis, the attitude of an individual is not the only factor that determines his use of a system, but is also based on the impact that it may have on his performance. Therefore, even if an employee does not welcome an information system, the probability that he will use it is high if he perceives that the system will improve his performance at work.

ICT Utilization

The application of Information and Communication Technology (ICT) in agriculture is increasingly important. E-Agriculture is an emerging field of ICT which has its focus in the enhancement of agricultural and rural development through improved information and communication processes. It involves the conceptualization, design, development, evaluation and application of innovative ways to use ICTs in the rural domain, with a primary focus on agriculture. The main phases of the agricultural industry are: crop cultivation, water management, fertilizer application, fertilisation, pest management, harvesting, post-harvest handling, transporting of food /food products, packaging, food preservation, food processing / value addition, food quality management, food safety, food storage, food marketing.

Factors of ICT Utilization

The factors that determines the utilisation of information and communications technology (ICT) includes; performance expectancy, effort expectancy, social influence, facilitating condition and price value. These factors are further explained under the subheadings below:

Performance expectancy (PE)

As mentioned before performance expectancy (PE) can be defined as the degree to which the user expects that using the system will help him or her to attain gains in job performance (Venkatesh et al., 2003). More concrete this means that people are more likely to adopt new technologies when they believe this will help them to perform their job. Venkatesh et al. (2003) integrated five concepts from various models into the construct of performance expectancy, namely perceived usefulness, extrinsic motivation, job-fit, relative advantage and outcome expectations. The concept of perceived usefulness was introduced by Davis (1986) in the Technology Acceptance Model and adapted by Taylor and Todd (1995) in their C-TAM-TPB. The definition of this concept is similar to the one of performance expectancy and refers to an individual's perception about the likelihood that the use of a system will enhance his or her performance on the job (Davis, 1986; Taylor and Todd, 1995). When the encouragement to perform an activity is achieving external outcomes, the motivation to do this is called extrinsic. Examples of extrinsic motivation are rewards and punishments such as salary, grades or promotions (Davis et al., 1992). Job-fit as a third concept can again be explained by the believe of an individual that accepting the technique or technology will lead to gains in job performance (Thompson et al., 1991). The extent to

which an individual perceives a new technology as being more useful than the previous one, simply explains the concept of relative advantage (Rogers, 1995).

Effort expectancy (EE)

The second concept, effort expectancy, can be defined as “the degree of ease associated with the use of the system” (Venkatesh et al., 2003). Similar to performance expectancy, Venkatesh et al. (2003) captured three constructs from other models into this concept that is perceived ease of use, complexity and ease of use. The first one, perceived ease of use, is a concept from the Technology Acceptance Model (Davis, 1986) which refers to the idea of someone that using the new technology will be effortless. The second concept integrated in effort expectancy, is complexity of the MPCU (Thompson et al., 1991). Complexity in this model, to be understood as the difficulty to use a system, as perceived by the users. Ease of use as a last concept, is a core construct of the IDT (Rogers, 1995) and its definition is apart from one difference equal to the one of complexity. The definition of complexity concerns a general system whereas ease of use is about an innovation (Venkatesh et al., 2003). Among others, Plouffe et al. (2001) and Thompson et al. (1991) confirmed the similarities between these concepts.

Social Influence (SI)

According to the UTAUT social influence of “the degree to which an individual perceives important others believe he or she should use the new system” (Venkatesh et al., 2003) is the third and last direct determinant of the behavioural intention to use a technique or technology (Venkatesh *et al.*, 2003). The three concepts included in social influence are: subjective norm, social factors and image. Each of these concepts refer to the notion that the social environment has a substantial influence on the way people act (Venkatesh *et al.*, 2003). Subjective norm was introduced in the TRA by Ajzen and Fishbein (1977), then used by Ajzen (1985) in his TPB and by Taylor and Todd (1995) in their C-TAM-TPB. Venkatesh and Davis (2000) extended the Technology Acceptance Model by including subjective norm as an extra concept for the prediction of behavioural intention. Their new model was called TAM2. The concept can be explained by one's perception about how important others think he or she should act. Social factors as a second concept integrated in social influence refers to the internalisation of the culture and social agreements the individual shares with others (Venkatesh et al., 2003). Social factors is a core construct of the Model of PC Utilization by Thompson et al. (1991). The third concept, image, is introduced in the IDT by Rogers (1995) and can be understood as the perception that the use of a new technique or technology will upgrade a person's image or social status.

Facilitating Condition (FC)

Facilitating conditions is the extent to which an individual believes that the existing organization and technical infrastructures can support the use of a system (Venkatesh et al., 2003). Facilitating conditions are seen as the level where

individuals are confident that their business or organisation has the infrastructure and the tools that can be used to accommodate ICT and it is said that facilitating conditions will have an effect on the use of technology (Venkatesh et al., 2003). The results of a descriptive analysis of facilitating conditions showed that users did not need any help in using Facebook but agreed that they needed the proper equipment to use Facebook, and this was found to be significantly related to the use of social media in Egypt (Salim, 2012).

Price Value (PV)

Extant research has proven that Cost related to deployment of ICT system is a factor that influences its utilisation. (Ernst and Young, 2001). The price value factor of ICT utilisation has been studied by various ICT based researchers (Seyal and Rahim, 2006), (Drury and Farhoomad, 1996), (Cox and Ghoneim, 1996) who have found a significant relationship between cost and use of technology. SMEs are more likely to adopt ICT systems that are perceived to have lower financial implications than those that do in other words, SMEs are less likely to adopt ICTs when their initial deployment costs are high (Dixon, Thompson & McAllister, 2002). Also research conducted by Poon and Swatman (1999) found that SMEs often have challenges in acquiring finances to invest in ICT as they may have more pressing managerial commitments, and do not see the immediate need to invest. Also due to the scarce nature of capital SMEs may find it hard to justify the need to spend money on ICT infrastructure and systems (Reynold, Savage & Williams, 1994). Tidd, Bessant and Pavitt(1997), research also revealed that SMEs challenges in the formation of ICT policies and strategies, due to the lack of expert knowledge and skills brought by specialized staff, which most companies find too costly to engage with.

Previous studies have established the tendency of relationship between ICT utilization and performance of firms. The investment on ICT by agropreneurs and managers’ ICT utilisation level, use of technology skills and abilities of

human capital strengthen the ICT effect on the firm. In essence, this implies that the greater the use of these technologies among employees and managers, the higher the impact on firm’s productivity (Bayo-Moriones, Billo’ &Lera-Lo’pez, 2013). In addition, apart from ICT-friendly policy, improvement of management commitment, customer focus, employees’ involvement, training and education, as well as reward and recognition to the employees are some of the factors that positively influence agro SMEs’ innovative technology use behaviour and pattern (Bayo-Moriones & Lera-Lopez 2007). Higon (2012) suggests that SME-friendly ICT policy and firm size have a positive effect on SMEs’ performance. Mpofu, Miline, & Watkins-Mathys, 2010) emphasised that skills and effective use of ICT knowledge are some of the factors that influence SMEs’ performance.

Poon and Swatman (1999) found that SMEs often have challenges in acquiring finances to invest in ICT as they may have more pressing managerial commitments, and do not see the immediate need to invest. Also due to the scarce nature of capital SMEs may find it hard to justify the need to spend money on ICT infrastructure and systems (Reynold, Savage & Williams, 1994). Tidd, Bessant and Pavitt(1997), research also revealed that SMEs challenges in the formation of ICT policies and strategies, due to the lack of expert knowledge and skills brought by specialized staff, which most companies find too costly to engage.

Conceptual Framework and Hypotheses

The figure below is the conceptual framework of the study which shows the dependencies or relationship between the study variables. The independent variables (IV) of the study are the factors of ICT utilization which includes; performance expectancy, effort expectancy, social influence, facilitating condition and price value as its indicators. While, the study dependent variable (DV) is the operational performance of agric based SMEs which has; employee satisfaction, product quality and service quality as indicators.

Factors of ICT Utilization

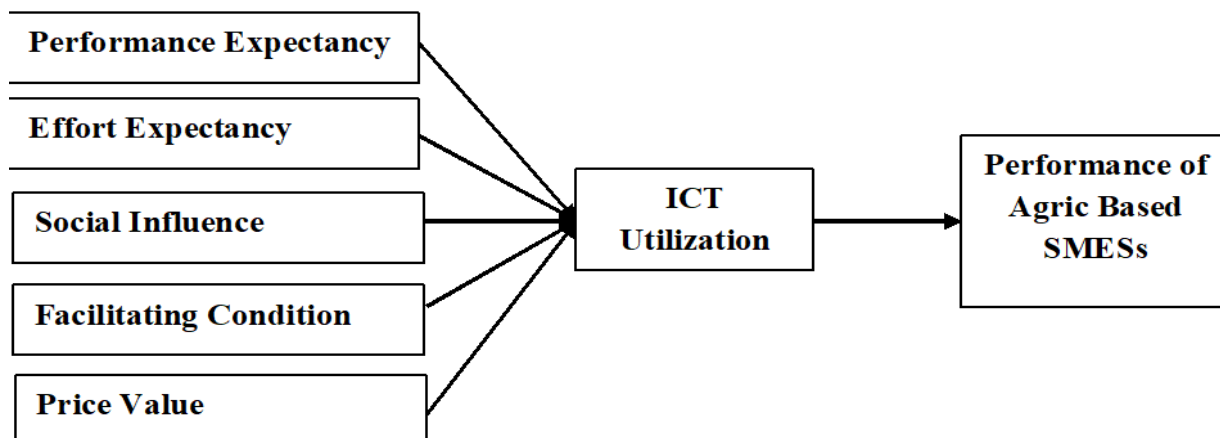


Figure 1: Conceptual framework

The study tested the under listed hypotheses:

H_{0a} : performance expectancy does not influence ICT utilization in Agric based SMEs

H_{0b} : effort expectancy does not influence ICT utilization in Agric based SMEs

H_{0c} : social influence does not influence ICT utilization in Agric based SMEs

H_{0d} : facilitating condition does not influence employee satisfaction

H_{0e} : price value does not influence ICT utilization in Agric based SMEs

H_{0f} : ICT utilization does not influence service quality

III. METHOD

This study adopts a survey research approach which allows an empirical testing of hypotheses and make generalization of the result. The population of this study comprises 206 employees of agro based SMEs in Ondo State, Nigeria. Primary data was collected in this study using a structured questionnaire which was self-administered through stratified random sampling to the 136 selected respondents derived through Slovin's formula. The questionnaire was divided into four sections: section A contained the background information such as age, gender and educational background and industry sector. Section B, C and D contained information on the influencing factors of ICT utilization and Agric based SMEs performance. The items of the questionnaire were designed using collected from previous studies on the constructs and designed using a 5-point Likert type scale. The primary data collected were analyzed using both statistical package for social sciences and partial least square structural equation modelling (PLS-SEM). SPSS was used for the preliminary analysis and demographic profile of the respondents through frequency and percentages statistics while PLS-SEM was used to examine the influencing factors and effect of ICT utilisation on the performance of agric based SMEs.

IV. FINDINGS

Out of the one hundred and thirty-six copies of survey questionnaires distributed to the respondents, one hundred and thirty-four (134) questionnaires were returned representing a response rate of 98.5%.

Profile of the Respondents

The description of the profile of the respondents through the frequency analysis of the age of respondents, gender of respondents, respondents' work experience, position of respondents in the organisation and their industry sector. Respondents' age group distribution shows that many of the respondents are still in their active age group and this will make them to be very productive. Specifically, age group 26 - 30 years has the highest percentage in the respondents' age distribution which is 38.1%. Age group of 31 years and above comes next with a 31.3% of the age distribution, while

respondents below the age group 26 – 25 years were the least represented in the total age distribution with a 30.6% representation. The gender characteristics show that the largest population of the respondents is male representing a total of 62.7% of the total respondents of the study. While a 37.3% of the respondents are females, this shows that males are more dominating the agro based industries in the study area.

In respect to work experience, the result of the demographic analysis revealed that respondents with 11 – 20years work experience represents the highest in the distribution having a 39.6% of the total distribution, coming in the second position is respondents with 10 years and below work experience accounting for a 32.1% of the distribution, while respondents with 31 years and above work experience are the least represented in the distribution accounting for a 4.5 % of the distribution. The position of staff shows that majority of the respondents are employees representing the highest in the distribution with a 78.0% representation while the next in line are the manager staff with a 16.0% representation in the distribution, while the least represented respondents in the total position distribution are the business owners with a 6.0% representation.

The industrial sector of the respondents for the staff within the agro based firms showed that majority of the agro based industries within the study focus majorly on crop production and produce with a 64.2% of the total distribution while a lesser 35.8% of the firms engage in animal production which may be as a result of the higher risks involved in animal production. The number of employees for the agro based firms within the study area presents that the firm with the highest number of employees has 11 – 50 employees with a 57.5% representation while in the second position is firm with 51 – 250 number of employees with a 26.1% representation while in the least position is firm with less than 10 number of employees representing a 16.4% of the total distribution.

Level of ICT utilization in Agro SMES

The level of ICT utilization was assessed through the mean values as shown in Table 1. The level of utilization of ICT is measured based on ICT application, ICT infrastructure, and ICT policy.

Table 1: Level of ICT utilization in Agro-Based SMEs

	Mean	Std. Deviation	Level
ICT Application	3.74	1.165	High
ICT Infrastructure	4.10	1.963	High
ICT Policy	4.36	1.88	High

Note: High level = 3.67 to 5.0, Moderate level = 2.34 to 3.66, Low level = 1 to 2.33

The mean values revealed that ICT policy is the highest ICT utilization indicator in the Agric based SMEs. The result indicates a high extent to which Agric based SMEs have utilized ICT policy in Ondo state, Nigeria. The result also

revealed a high level of ICT utilization in respect to ICT infrastructure and applications.

Assessment of measurement model: items loadings, Average variance extracted and composite reliability

This study assessed the measurement model through the convergent validity which indicates the degree to which several items measuring a certain concept agreed. The loadings, average variance extracted (AVE), and composite reliability (CR) was assessed for the achievement of validity. The result of the statistical analysis as shown in Table 7 indicates a good item loading above the threshold of 0.4 recommended by Hair et al., (2014). The result of internal consistency revealed that the values for composite reliability are all above the threshold values of 0.7 indicating a good internal consistency among the constructs. In addition, the result of the AVE shows that the values of all the construct are well above the threshold value of 0.5 indicating that the amount of extracted variance by the latent variables are above 0.5. These results indicate that the values of the item loading, composite reliability and AVE all exceed the threshold values and hence, achievement of convergent validity.

Table 2: Convergent validity

	Cronbach's Alpha	rho_A	CR	AVE
Effort expectancy	0.845	0.865	0.906	0.763
Facilitating Conditions	0.918	0.925	0.948	0.859
ICT Utilization	0.966	0.968	0.975	0.907
Performance Expectancy	0.921	0.937	0.944	0.807
Price Value	0.821	0.822	0.894	0.737
Social Influence	0.808	0.851	0.89	0.732
Performance of Agric Based SMES	0.93	0.932	0.951	0.828

Assessment of Structural Model

This section presents the results of the hypothesized relationships of the study. The PLS path analysis was assessed through the structural model to evaluate the effect of influencing factors on ICT utilization in Agric based SMEs and the influence of ICT utilization on performance of Agric based SMEs.

Hypotheses testing

The R² value of 0.787 of the model on the influencing factors of ICT utilization indicates that the influencing factors explain 78.7% variance in ICT utilization among Agric based SMEs. The result of the hypotheses testing in this study as shown in Table 3 indicates a significant effect of the influencing factors: performance expectancy ($\beta = 0.234$, $t = 2.186$, and $P < 0.05$), effort expectancy ($\beta = 1.150$, $t = 2.237$, and $P < 0.05$); social influence ($\beta = 0.300$, $t = 5.632$, and $P < 0.05$), facilitating condition ($\beta = 0.208$, $t = 2.140$, and $P < 0.05$), and price value ($\beta = 0.999$, $t = 14.440$, and $P < 0.05$).

Table 3: Hypothesis testing

	Hypothesis	Standardized Coefficients (Beta)	T - Value	P- Value	Decision
H0 _a	PE -> ICT Utilization	0.234	2.186	0.029	Significant
H0 _b	EE -> ICT Utilization	1.150	2.237	0.025	Significant
H0 _c	SI -> ICT Utilization	0.300	5.632	0.000	Significant
H0 _d	FC -> ICT Utilization	0.208	2.140	0.032	Significant
H0 _e	PV -> ICT Utilization	0.999	14.440	0.000	Significant
H0 _f	ICT Utilization -> Performance Agro based SMEs	0.615	7.650	0.000	Significant

The hypotheses result implies that increase in the influencing factors (performance expectation, effort expectation, price value, social influence and facilitating condition) will increase the utilization of ICT in Agric based SMEs. The magnitude of the values of standardized coefficients between the variables and ICT utilization indicate weak correlation relationships between the influencing factors and ICT utilization. However, the positive values indicate positive relationships between the influencing factors and ICT utilization. This finding corroborates the assertion of UTAUT who identified that effort expectancy, performance expectancy, social influence, price value and facilitating conditions are the factors influencing the utilization of ICT in any organization. The findings are also in-line with Oshlyansky, Cairns and Thimbleby(2007) who found performance expectancy, effort expectancy and social influence as significant determinant of ICT utilization. Šumak, Polančič and Heričko (2010), Al-Qeisi, Dennis, Hegaz and Abbad (2015), Baptista and Oliveira (2015) identified the price value of acquiring ICT as a powerful predictor of utilization.

In addition, the R² value of 0.619 between ICT utilization and performance of Agric based SMEs indicates that ICT utilization contributes 61.9% variance in the performance of Agric based utilization. The result of the path coefficient on the relationship between ICT utilization and performance of Agric based SMEs shows a significant positive effect of ICT utilization on performance of SMEs. The finding implies that increase in ICT utilization will improve the performance of Agric based SMEs in Ondo State, Nigeria. The finding is in-line with Kollberg and Dreyer (2006) affirmed that how managers effectively and efficiently utilizes the ICT resources of organization influences the business performance. According to Olarewaju (2009), performance entails how an enterprise identifies with their customers' needs and expectations, and it reflects in what way an enterprise makes use of its resources in order to ensure its objectives achievement and the attainment of its set goals.

V. CONCLUSION

This study found that there is a high level of ICT utilization among the Agric based SMEs in Ondo State. It also concludes that performance expectancy, effort expectancy, facilitating condition, social influence and price value are the predictor of ICT utilization in Agric based SMEs. Therefore, the study recommends that Agric business owners/ managers should ensure that competent and suitable employees who are well skilled in the use of ICT tools are hired for the specific ICT related jobs and efforts should be made to ensure that their high level of use of technological innovation does not lead to direct loss of jobs and early retirement of their employees. Rather than ICT investment, agropreneurs and managers' should focus on ICT utilisation level, use of technology skills and abilities of human capital strengthen the ICT effect on the firm. In essence, this implies that the greater the use of these technologies among employees and managers, the higher the impact on firm's productivity (Bayo-Moriones, Billo'n&Lera-Lo'pez, 2013).

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