

The impact of conformity, effort and performance expectancies on SMEs information technology adoption in Nigeria

Mark Ojeme^{1,*}, Martins Odiase²

¹Leadership, Management and Marketing, De Montfort University (DMU), Leicester LE1 9BH, UK

²Department of Business, Economics, Accounting and Finance, Durham University International Study Centre, Stockton-on-Tees TS17 6BH, UK

* Corresponding author: Mark Ojeme, mark.ojeme@dmu.ac.uk

ARTICLE INFO

Received: 12 September 2023

Accepted: 1 December 2023

Available online: 18 December 2023

doi: 10.59400/issc.v3i1.227

Copyright © 2023 Author(s).

Information System and Smart City is published by Academic Publishing Pte. Ltd. This article is licensed under the Creative Commons Attribution License (CC BY 4.0).
<https://creativecommons.org/licenses/by/4.0/>

ABSTRACT: This paper investigates the drivers of SMEs' adoption (Small and Medium-sized Enterprises' adoption) of information technology (IT) in Nigeria, underpinned by the performance expectancy, effort expectancy, and conformity impact on IT adoption. In addition, the study examined the impact of an organizational existence on IT adoption. Confirmatory factor analysis was applied to establish the model's goodness-of-fit, while Structural Equation Modelling was employed to test the proposed model's hypotheses. Further, multiple regression analysis was used to test the organization's years of existence effect on IT adoption. The overall arching finding indicates the predominant role of performance expectancy in explaining organization adoption of IT systems. Furthermore, effort expectancy (ease of IT usage) showed mixed results. While it was a predictive construct in the overall study model, it proved redundant under five years of organization existence but was predictive of organizational existence over five years. The conformity construct (maintenance of status quo) was insignificant in the study. The research adds value to the information technology literature by establishing the factors that drive 20 SMEs IT adoption in Nigeria, especially where organization age is concerned. The unit of analysis was at the organization level; there is wisdom in considering employees' demographics, 22 such as employee's education, IT experience, or organizational trade in future studies.

KEYWORDS: Performance and effort expectancies, conformity, SMEs, IT adoption, organizational existence

1. Introduction

For some decades, information technology (IT) has received significant attention and research amongst academics and practitioners^[1-3]. Studies in these areas aimed to identify, understand, predict, and explain factors that serve as crucial in explicating the utilisation of IT at both individual and organizational levels^[1,4-6]. Theoretically, IT adoption represented models such as the diffusion of innovation theory (DOI)^[7], the technology acceptance model (TAM)^[8,9], and the unified theory of acceptance and use of technology (UTAUT)^[10]. These models have had prominence in the literature in predicting IT adoption, acceptance, and usage in organizations. Among IT acceptance theories, the UTAUT model took the "tie together" approach by developing an integrative model that incorporates various cardinal drivers of IT adoption in the literature^[10,11].

Further development of the UTAUT model led to the exclusion of voluntariness of use as moderator since consumers have no organizational mandate and, in many situations, consumer behavior is voluntary^[4,11]. The UTAUT2 included hedonic motivation (e.g., enjoyment) and habit as better explanatory variables on IT adoption^[11]. The predictive ability of UTAUT2 theory is much higher in comparison to UTAUT, explaining about 74 percent of the variance in consumers' behavioral intention and 52 percent of the variance in consumers' technology usage^[4,12]

Although, UTAUT/2 appears to be dominant in its predictive and explanatory effect on IT adoption, however, the puzzle in the literature is the effect of cultural diversity and perception on the model prediction, especially in the developing societies where there is less development and differing cultures as opposed to the western societies' counterpart^[6]. As mentioned by Anandarajan et al.^[6], the distinction between the Western and Nigerian cultures suggests that "information technology and management practices should be modified for different cultural contexts". Importantly, most IT technologies seemed to be predominantly developed in Western societies; thus, the adoption and utilization in developing countries present potential challenges and opposition based on cultural differences and perceptions amongst these two countries. Despite the solemnity of these differences, investigations of IT adoption models in Nigeria^[2,13]; still fall short of a robust IT model that integrates the dimensions of cultural values and perceptions^[6]

In seeking to address the cultural element relevant to the study setting, this research paper integrates the Schwartz^[14-16] human motivation theory in conjunction with the main factors of UTAUT/2 (expectancy and effort) that potentially serve as influencers to SMEs technology adoption in Nigeria. Our study approach is in line with Tamilmani et al.^[4] comprehensive review of the UTAUT2 suggestion that the IT model serves as a "theoretical lens for understanding technology adoption-related issues in a variety of settings, either stand-alone, in combination with other theories, or with the addition of external variables". Therefore, we have identified the conformity construct amongst the Schwarz^[14] ten human basic motivational values. Conformity is considered the most important cultural variable in previous studies that explains the factor that hinders IT utilisation in developing countries^[17-20]. Further, from a nationalistic point of view, Nigeria is considered a collectivist society^[21], and thus values the preservation of in-group solidarity and places greater emphasis on tradition^[22]. Therefore, the conformity construct (individual values) is relevant to the collectivist nature of the research setting in Nigeria.

In addition, we examined the effect of business years of operation (age) in congruence with the UTAUT/2 model of age implication for IT adoption. To the best of the researchers' knowledge, no previous studies within the developing economies have developed a model that both integrates the conformity construct and the performance and effort expectancies of the UTAUT/2 model, despite its impetus, and call for studies to integrate the interaction of UTAUT and cultural variables to improve the understanding of the drivers to IT adoption, particularly in developing economies^[4,23]. The research has two key questions: firstly, to identify the relevant factors that drive SMEs IT adoption in Nigeria. Secondly, to understand the dynamics of business existence on IT adoption in Nigeria. The study contextualizes IT as the development, maintenance, and use of computer software, systems, and networks to digitally create, collect, store, manipulate, and relay office information needed for accomplishing basic and technical tasks within the organization for effective daily running of the business.

2. Unified theory of acceptance and use of technology

Venkatesh et al.^[10] developed the UTAUT conceptual model with four main variables regarded as the determinants of technology adoption and usage in organizations. The variables are performance expectation, effort expectation, social influence, and facilitating conditions. Demographics such as age, gender, experience, and voluntariness of use are considered moderators of the four main variables^[10,11]. However, in 2012, the original UTAUT model was extended and integrated three more variables: habit, price value, and hedonic motivation. The theoretical model was termed UTAUT2^[11]. The UTAUT2 theory was specifically developed to enhance the use of technology by potential customers and provided more factors impacting technology usage.

2.1. Performance expectancy (PE)

The performance expectancy (PE) variable measures the degree to which potential adopters of IT systems believe the new systems will improve his/her performance or gain benefits with the usage of the new IT systems^[4]. It can be suggested that SMEs owners will be more motivated to accept new technology into their businesses if they perceive and believe that using the new technology is more beneficial, advantageous, and valuable to help them improve daily job performance^[5,11,24]. The study by Moghavvemi et al.^[25] examines the entrepreneur's perception of IT innovation adoption in Malaysian (SME owners). Findings show that the performance expectancy variable positively influenced SMEs owners' intention to adopt IT innovation into their businesses. This finding echoes similar relevance of the predictive effect of PE in recent studies^[5,24-30]. The study hypothesized employees perceived the usefulness or relative advantage of IT systems will lead to a positive tendency to accept IT usage in the organization.

H₁: IT adoption by the SMEs is positively influenced by performance expectancy.

2.2. Effort expectancy (EE)

Effort expectancy (EE) is the ease associated with the use of new IT systems^[10-11]. This will potentially influence its adoption, acceptance, and usage. The intention by SMEs to embrace new IT systems into their businesses is not only determined by how much the IT is valued, but using this IT should be less complicated. This variable plays a significant role in predicting SMEs owners' intention to adopt the technology. Previous works have examined this variable and found it a predictive and influencing factor towards IT adoption^[5,24,28,31-33]. Similarly, Yi-Shun and Shih^[34] evaluated user acceptance of information Kiosk. Their findings revealed that user ease of use remains an important factor in adopting new technology. This finding is supported and in line with the work by Moghavvemi et al.^[25]. The effort expectancy variable is rooted in perceived ease of use^[9,35] and complexity^[36]. The study hypothesized that as employees perceived the ease of use of IT systems, there would be a positive tendency to accept IT with the organization.

H₂: IT adoption by the SMEs is positively influenced by effort expectancy.

2.3. Conformity (CO)

This variable is associated with conservatism and the maintenance of the status quo. In this cultural setting, individuals exhibiting this type of value are characterized by restraint of action. They are expected to be obedient and tend to follow precise rules to guide their actions and behavior. In other words, it is a value that limits and restrains actions in everyday interactions^[14,37]. Here, individuals are not driven by their personal thought and action, which limits their ability to choose their own goals. This value does

not encourage creative and independent thought, which is associated with openness to change. According to Hofstede et al.^[38], orientation towards conformity may have a negative impact on IT adoption. This is in line with the study by Srite and Karahanna^[39]. The reason for this is that such cultural values are associated with uncertainty avoidance. In an uncertainty avoidance culture, people seek to maintain the status quo. They are neither creative nor are they willing to try new things. These attitudes serve as impediments to technology usage. The study by Bagchi et al.^[17] proposed that individuals with conformity values are less likely to use IT because they always conform to agreed rules and regulations. They only do what their superiors in organizations told them to do, and such attitudes may hinder individuals from carrying out their tasks with IT. Other research in the literature also finds this variable important, and all suggested that it had a negative impact on IT behavior^[18-20]. Therefore, the following hypothesis is reached:

H₃: The conformity value has a negative influence on SMEs IT adoption.

2.4. IT adoption (dependent construct)

Finally, IT adoption represents the dependent variable in this study, as clearly shown in the research model in **Figure 1**. This dependent variable aimed to provide an explanation relating to SMEs' intention to continue using the technology in carrying out their daily duties^[11,40]. It also implies the positive tendencies of SMEs' to continue to use technology in the future. The study by Venkatesh et al.^[11] argued that behavioral intention has a positive impact on actual behavior. As hypothesized in this study, performance expectancy and effort expectancy are expected to be positive, while conformity factors are expected to be negative influences on IT adoption within this context of the Nigerian SMEs setting.

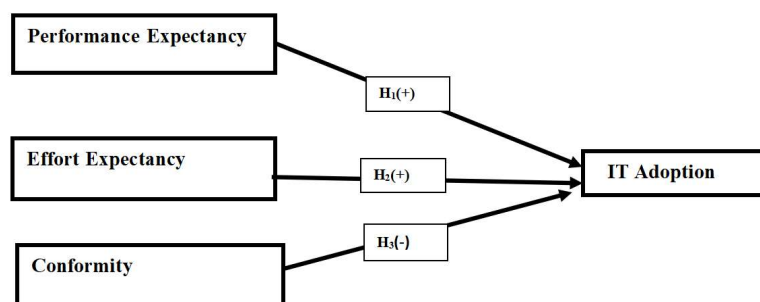


Figure 1. SMEs' IT adoption model.

Figure 1 depicts associated factors that are hypothesized to drive SMEs' technology adoption in a developing country.

3. Research method

3.1. Survey instruments and data collection

All measurement items were adopted from the literature. The seminal IT adoption studies of Venkatesh et al.^[10-11] informed the adaptation of the items measuring performance expectancy (four items), effort expectancy (four items), and IT adoption (three items), while Schwartz et al.^[41] intra-cultural values seminal measurement items of conformity (four items) were adapted to the study context. These items were empirically tested in several IT research settings with proven statistical validity^[26,42,43].

The four measurement items of performance expectancy captured increase company productivity, useful to staff to accomplish their jobs more quickly, would likely improve company performance and find it valuable in their jobs. Whereas the four items related to effort performance measure how the company finds interaction with IT systems simple and straightforward, the company believes that IT

systems are easy to use, the company staff can easily become skilled in IT systems, and the company believes that learning to operate IT systems is easy. In terms of conformity, the four measurement items captured how the company's staff always follow IT system rules even when no one is watching, staff avoid doing anything people would say is wrong, show respect to IT company rules, and staffs' non-disturbance to others with their IT systems. Finally, IT adoption items captured companies that like to use IT applications, company that use IT applications daily, and companies that intend to use IT applications frequently. All items were measured with a seven-point Likert scale ranging from very strongly agree (7) to very strongly disagree (1), with a midpoint (4) for neither agree nor disagree.

In line with Hardesty and Bearden^[44], and Churchill^[45], the authors carried out face validation to rectify any problems before data collection, such as to ensure that the measurement items reflect the conceptual domain of a construct, items are worded in a manner that portrays clarity and non-ambiguity to potential respondents, and lastly to determine the time required for survey completion. The face validation involved the review of the construct items by four Nigerian academic experts' in the discipline and experienced within the study's context. After careful consideration based on the pilot respondents' feedback, minor changes were made to the wording of some questions.

The National Bureau of Statistics (NBS) and Small and Medium Enterprises Development Agency^[46] characterized Nigeria's 73,081 SMEs as each comprising of between 10–199 employees and having total assets of between 5–500 million naira (£9000 thousand–£878,000 million sterling). The distribution method used for data collection from this target audience was multi-stage cluster sampling. Identified clusters of SMEs from selected Nigerian States were used, including Edo State (capturing 2677 SMEs) and Lagos (8395 SMEs); consequently, the sampled population for the study represented 11,072 SMEs derived from the two states' population of SMEs. These states were selected given their high density of SMEs and accessibility to these SMEs within the States. The second sampling stage involved selection at random of areas of high SMEs density within the selected locations, followed by convenience selection of SMEs within these chosen business districts.

A trained research team approached businesses on a random basis to inquire about the number of employees and if IT systems were used in the organization. At this point, only organizations that stated that they had employees within the definitional framework of SMEs (10–199 employees) and had existing organizational IT systems were physically given the survey to complete. Specifically, the survey was targeted to the SME owners or senior management officers that have enough knowledge of the business IT adoption and operations.

Out of 310 distributed questionnaires, 231 were returned; however, 11 were eliminated due to missing data, reducing the usable data set to 220, representing a usable survey response rate of approximately 71%. In addition, we took cognizance of the need for respondents' anonymity to reduce the effects of common method biases^[47]. Hence, respondents were reassured of data anonymity and encouraged to participate in the study without any form of social desirability and wanting to please or gain favor from the research assistants. Furthermore, the survey instruments followed Podsakoff et al.'s^[46] guide for cause-and-effect variables not to be presented in a predictive way so that the respondents would not preempt and respond to questions without careful thought and being objective. We ensured this by listing all questions together and not segmenting the variables of measurement. Also, we tested for common method bias using Harman's single factor score criterion of less than 50% variance. The total variance explained 29% of variance, which is less than 50% threshold; therefore, it can be asserted that common method bias was not a problem in our collected data, nor in the result.

3.2. Demographic profile

The review of the data profile in **Table 1** shows that the highest represented business sector is information technology, with a percentage of 27.3%, followed by the telecommunications sector, which represented a value of 17.7%. The lowest represented sector is the restaurant business (0.9%), with only two respondents. The business profile shows a broad representation of various businesses in Nigeria.

Table 1. Business sector.

Business sector	Frequency	Percent
Information technology	60	27.3
Telecommunication	39	17.7
Education	23	10.5
Retail sales	20	9.1
Finance	17	7.7
Oil and gas	14	6.4
Transportation	11	5.0
Hotel	10	4.5
Health care	8	3.6
Construction	7	3.2
Manufacturing	6	2.7
Agriculture	3	1.4
Restaurant	2	.9
Total	220	100

In addition, **Table 2** shows the profile of business years of operation. Most of the businesses representing a total number of 93 had been in existence for 5–10 years, which is indicative of some level of medium-term business years of existence. While under five years of existence represented 67 businesses, and the longest business existence (21 years and above) represented 10 respondents.

Table 2. Years of business operation.

Years	Business
< 5 years	67
5–10 years	93
11–15 years	35
16–20 years	15
21 years and above	10
Total	220

However, in terms of financial capitalization, most of the businesses (80.9%) were within the small-business range, as captured in **Table 3**. This is indicative of under capitalization of business, which is a typical problem of SMEs in developing economies^[48,49]. For instance, in Nigeria, 89.6% of SMEs identified a lack of access to finance as the most consequential business challenge^[46].

Table 3. Business capital.

Monetary value	Numbers	Percent
< N50 million	178	80.9
N50–N150 million	30	13.7
N151–N250 million	6	2.7
N351–N499 million	6	2.7
Total	220	

4. Data analysis

This study followed a two-stage approach recommended for model validation and structural relationship assessment^[49,50]. Stage one involves measurement of model validity and goodness-of-fit assessment by following the CFA technique^[50,51]. The second stage of analysis involved an application of SEM to ascertain the structural model by using the maximum likelihood (ML) estimation method. Further analysis considered business years of operation to ascertain the effect of short- and long-term IT usage in the organization. To achieve this objective, the research employed multiple regression analysis to analyze the data.

4.1. Convergent validity assessment (CVA)

To determine convergent validity, the study adapted the approach of Hair et al.^[51], using CFA factor loading estimates, average variance estimates (AVE), and composite reliability (scale reliability) assessments. In terms of thresholds, composite reliability should not be less than 0.70, while factor loading estimated is acceptable from 0.50, as suggested by Bagozzi and Yi.^[52] Likewise, AVE greater than or equal to 0.50 is the minimum acceptable estimate^[51,52].

Table 4. Convergent validity assessment.

Constructs	Indicators	SFL	AVE	CA
Performance expectancy (PE)	1) IT systems usage will increase my company productivity.	0.69	0.54	0.76
	2) My staff find IT systems useful in their jobs.	0.80		
	3) Using IT systems would likely improve our company performance.	0.71		
Effort expectancy (EE)	1) My company finds interactions with IT systems simple and straightforward.	0.76	0.55	0.79
	2) My company believes that IT systems are easy to use.	0.76		
	3) My company can easily become skillful in IT systems usage.	0.74		
	4) My company believes that learning to operate IT systems is easy.	0.69		
Conformity	1) My staff follow IT system rules always, even when no-one is watching.	0.68	0.65	0.86
	2) My staff avoid doing anything people would say is wrong, especially with IT systems.	0.79		
	3) My staff always show respect to company rules, especially with IT systems.	0.89		
	4) My staff never disturb or irritate others with their IT systems usage.	0.84		
IT adoption	1) My company likes to use IT application	0.68	0.56	0.82
	2) My company uses IT applications daily.	0.81		
	3) My company intends to use IT applications frequently.	0.73		

Note: SFL = standardized factor loading, AVE = average variance extracted, CA = Cronbach’s alpha.

The CVA resulted in the deletion of one poor-performing item labelled; ‘IT systems will enable my company to accomplish tasks more quickly’. This item was deleted due to unacceptable reliability and factor loading performance. The deletion is necessary to avoid the problem of excessive levels of multiple collinearities and poor quality of model goodness-of-fit^[53,54], Other CVA results, as indicated in **Table 4** above, indicate that convergent validity was achieved across the three criteria applied. All factor estimates

loaded above 0.50. Equally, AVE scores were above 0.50, and lastly, all reliability scores were above the 0.70 thresholds; therefore, it is established that the research constructs have satisfied the convergent validity requirement.

4.2. Discriminant validity assessment

The most rigorous assessment of discriminant validity is when AVE is greater than the square inter-correlation (SIC)^[51,55]. AVE is the sum of the average mean value of the total factor loadings of the measurement items to a construct^[51], while the SIC represents the shared variance of correlation between two constructs being measured. **Table 5** suggests that the relational variable AVEs are larger when compared to all other alternative paired squared correlations, therefore, in accordance with Hair et al.^[51] Farrell^[55], the result has established sufficient discriminant validity amongst the variables of interest.

Table 5. Constructs discriminant validity assessment.

	Performance expectancy	Effort expectancy	Conformity	IT adoption
Performance expectancy	0.54	0.27	0.14	0.44
Effort expectancy		0.55	0.30	0.29
Conformity			0.65	0.10
IT adoption				0.56

Note: the diagonal values represent the average variance extracted (AVE) estimates, while the values above the AVE represent the squared inter-correlations (SIC).

4.3. Tests of measurement and structural model goodness-of-fit

As a result of the achievement of convergence and discriminant validity assessments, we further tested the goodness-of-fit for the measurement and structural models. As presented in **Table 6**, the results suggested that the measurement and structural models have satisfactory goodness-of-fit within acceptable threshold points.

Table 6. Measurement and structural models goodness-of-fit assessment.

Fit indices	Measurement model	Structural model	Model criteria
χ^2/df	1.13	1.1	<2 ^[51]
GFI	0.94	0.96	> 0.90 ^[52]
AGFI	0.91	0.93	> 0.90 ^[52]
CFI	0.92	0.99	> 0.90 ^[52]
IFI	0.93	0.99	> 0.90 ^[52]
RMSEA	0.037	0.009	< 0.07 ^[52]
TLI	0.90	0.99	> 0.90 ^[52]

4.4. Pathway estimates

The study applied SEM in IBM SPSS AMOS 25 with the maximum likelihood (ML) estimation method to estimate the pathways (hypotheses) in the IT adoption model. The research model is based on the theoretical propositions that both the performance and effort expectancies will positively predict IT adoption, whereas conformity is hypothesized to negatively predict IT adoption. The estimated SEM diagrammatic model and the representation of the estimated hypotheses are both depicted, respectively, in **Table 7** and **Figure 2** below:

Table 7. Representation of hypothesis results.

Hypothesis	Path coefficient	P-value	Support model?
H ₁ Performance expectancy → IT adoption	+0.35	0.00	Yes
H ₂ Effort expectancy → IT adoption	+0.38	0.03	Yes
H ₃ Conformity → IT adoption	-0.05	0.55	No

Note: significance test level at 0.05.

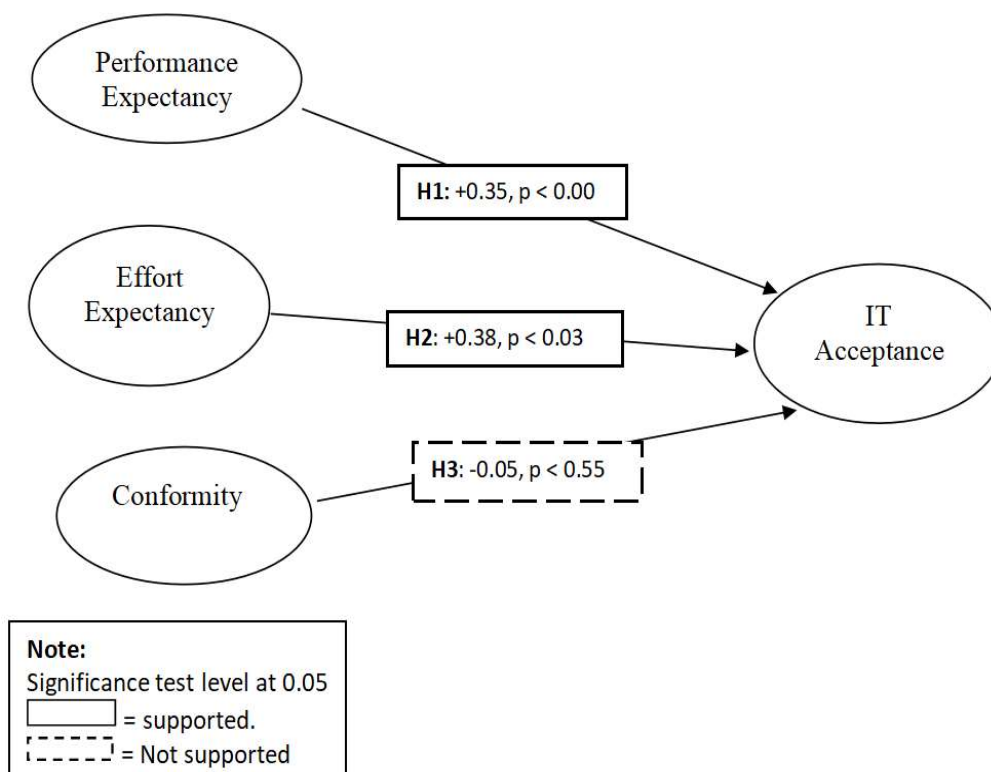


Figure 2. IT adoption model.

4.5. Testing the impact of business years of existence on IT adoption

To further test the effect of years of business existence, the study conceptualized years of existence into two main categories: under five and above five years. The data size suggested that under five years business operation constituted 67 organizations, while above five years comprised 153 organizations. Next, we applied multiple regression analysis to test the effect of age differences on these two categories on IT adoption.

A comparison of organization existence under and above five- years of existence in the respective models suggests a predictive effect of both 47.8% and 24.2%, respectively, on IT adoption. When assessing the coefficient of the independent variable, it is suggestive that performance expectancy was a significant independent variable explaining the positive impact on the driver of IT adoption, with a predictive effect of 53.7% and 26.6%, respectively, on under-five and above business existence. The effort expectancy variable was insignificant at 41.9% under five years of existence; however, for the business age above five years, effort expectancy was predictive and significant with a 28.3% explanatory power on IT adoption. Lastly, as indicated in **Table 8**, the conformity variable had an insignificant value test above the 0.05 test acceptance level. This resulted in our rejection of the explanatory powers of the construct as unacceptable. The discussion section below provides a contextual explanation of the results.

Table 8. Test of organizational years of existence impact on IT adoption.

Model/variables impact	Organizational existence Under five years	Organizational existence Above five years
R	0.691 ^a	0.492 ^a
R square	0.478	0.242
Sig. F change	0.000	0.000
PE (Standardized coefficients)	0.537	0.266
Significance	(0.00)	(0.001)
EE (Standardized coefficients)	0.101	0.283
Significance	(0.419)	(0.001)
Conformity (Standardized coefficients)	0.165	0.105
Significance	(0.160)	(0.180)

a. Predictors: (constant), conformity, PE, EE; b. Dependent variable: IT adoption; c. Significance test at 0.05.

5. Discussion

This study set out to investigate the drivers of SMEs adoption of technology in Nigeria by applying theoretical constructs from the literature. Precisely, the study model was underpinned by performance expectancy, effort expectancy, and conformity construct impact on the adoption of IT in SMEs organizations in Nigeria. In addition, the study tested the impact of short- and long-term organizational existence to examine its influences on technology adoption. The authors conceptualized it as the development, maintenance, and use of computer software, systems, and networks to digitally create, collect, store, manipulate, and relay office information needed for accomplishing basic and technical tasks within the organization for effective daily running of the business.

The overall arching finding in the research is in consonance with the literature of the predominant role performance expectancy (job value enhancement) in predicting the employees' intentions to adopt the use of technology^[5,11,23,26,28,31,56,57]. Furthermore, effort expectancy, which measured the degree of ease associated with the use of new IT systems, showed mixed results. While it was a predictive construct in the overall study model, it proved redundant under five years of organization existence but was predictive of organizational existence over five years. Further explanation will be provided later. Finally, the study found that regardless of the age of organizational existence, the conformity construct, which measured the degree to which the organization workforce considered others and inclines to use IT systems as the right thing to do, was not as significant as organization IT adoption. Logically, it appears that SMEs considered adoption of IT more from a business perspective, regardless of cultural inference or restraint imposed by the conformity construct. That is, as a business owner, the drive is to use IT because it will enhance the performance of my business, and therefore, the organization's team is willing to make the effort to source, install, and use IT software because it will enhance the performance of the business. This reason also implies the internal forces have a greater influence on IT adoption when compared to social cultural forces captured by conformity.

5.1. Performance expectancy (PE) and IT adoption

The concept of PE, as explained by Venkatesh et al.^[10], denotes the intrinsic values of the employees that the adoption of technology in the organization will help the organization attain its goals and increase its business effectiveness. A similar explanation of PE is the concept of perceived usefulness, which focuses on the degree to which an organization considers that using a particular IT system will enhance

the business performance^[5]. PE motivation examines the belief that IT adoption will help an organization to achieve value outcomes that are distinct from the organization itself, such as improved business performance, gain more business, or increase profits. The finding is indicative that the key motivation for organizations to adopt IT systems is to enhance business performance.

Our study finding suggests that a business owner considers that the intrinsic rewards of IT adoption will increase its overall business effectiveness, such as making a business more efficient with resources, increasing company productivity, getting jobs completed more quickly, and increasing company performance. The study finding on PE is indicative of the intrinsic drive of SMEs to keep the business afloat, but using an effective IT system that works. The study finding resonates with early studies that proved that PE drives IT adoption. For instance, Moghavvemi et al.^[25] examine the entrepreneur's perception of IT innovation adoption in Malaysians (SMEs owners). Findings show that the PE variable was positively significant in influencing SMEs owners' intention to adopt IT innovation into their businesses. Similarly, our study is in line with the literature^[23,26,29-31] dominant finding of the performance expectancy driver of an organization's (or employees) desire to adopt an IT system into their organizational or employees' practices.

Further use of control variables of age of organizations under and above five years of operation still confirmed that PE is valid in explaining IT adoption. Therefore, the study can safely confirm that the PE construct appears to be a fundamental driver for SMEs' intention to adopt IT systems to improve business performance. This is sensible, as no business (even a charitable organization) is set up to be ineffective, but rather to be effective and thrive as an organization. To this effect, the IT system seemed to be the golden toolkit for business effectiveness and sustainability.

5.2. Effort expectancy (EE) and IT adoption

This construct captures the degree of ease associated with the organization's adoption of IT systems^[10,11,57]. That is, how does the organization's workforce perceive the ease of use of IT systems or the complexity of using the system? The study findings showed mixed results of EE explanatory effect on SMEs system adoption. First, the pivotal research model indicated EE had a positive effect on system adoption. By implication, it explains that the workforce finds SMEs systems easy to use, less complex, and as a vehicle to improve SMEs' overall performance. Whilst these are plausible findings, the control analysis of years of business indicated that, in fact, the perceived ease of use or the less complexity of IT systems within the SMEs organization was positive and predictive for businesses existence over five years, whereas businesses under five years had an insignificant result.

This study's findings seemed contrary to Venkatesh et al.^[10] argument that EE is more salient in the short run of immediate employee training. This is argued to be vibrant in the early stages of EE on systems due to the vibrancy of the employees and excitement associated with using new systems. The expectation is for a longer period to impact negatively on the system due to the prolonged complexity associated with the IT system. In contrast, the authors argue that the result may be different from an organizational perspective. The logic here lies in years of experience and proven results as motivation to use IT systems. For example, an organization with 10 years of operation seems to have a wealth of experience and familiarity with how IT systems work, whereas an organization under five years old may not understand how to effectively use IT systems, perhaps leading to discouragement, frustration, and negative behavior towards IT system adoption. Put differently, we argue that the complexity of IT use is softened as the wealth of organizational experience increases, such that the organization becomes more familiar with the IT system. Another reason may be that older businesses may be able to afford and access IT partners for

technical support on the implementation of IT systems in the organization, while newly start-up organizations (under five years) may find IT partners simply not affordable or valued at the early stage.

5.3. Conformity and IT adoption

This construct examines the intrinsic attitude of the workforce to incline toward the use of IT systems provided within the organization, driven by the desire not to violate the organization norm. This implies that for interaction to proceed smoothly and for groups to maintain themselves, individuals must restrain impulses and inhibit actions that might hurt others^[58]. The findings from the study indicated that conformity was not supported in explaining IT adoption within the study context. Perhaps the drive within the organization is more focused on the extrinsic gains from IT adoption and the long-term ease of use, which may further increase the use of IT adoption. Furthermore, studies have generally found that the strong motivation of behavior tends to be predicated by the intrinsic factors explained in this study by PE and EE, in contrast to social norms as a driver of behavior. Logically, a business will consider more of the performance gains from the use of IT systems and the ease of use, which may further drive the desire to adopt IT systems in the organization.

6. Conclusion

Theoretically, the study presented an IT adoption model by drawing from the UTAUT variables on performance and effort expectancy^[10,11] and conformity construct^[58] to examine what drives IT adoption in Nigeria. Furthermore, our study tested the role of age in influencing the effect of IT adoption. The model was empirically investigated with the key findings that PE and EE were relevant in explaining IT adoption in Nigeria, whereas the social conformity variable was insignificant. Where organizational age of existence (under or above five years) is considered, performance expectation was an outstanding factor to drive IT adoption.

To the best of the researchers' knowledge, no previous study within the developing economies has applied intra-cultural (conformity) and UTAUT (performance and effort) models to assess the impact on SMEs IT adoption. The research showed the relevant variables within the SMEs setting in Nigeria. Besides, the empirical testing of age implication is novel within the research setting, which throws light on its dynamic influence on IT adoption.

Practically, this research is sensible to business owners as it identifies what will make IT system adoption thrive in Nigeria. It provides such managerial knowledge and toolkits that the performance driver is the principal reason for IT adoption. Therefore, an organization must clearly communicate the intrinsic benefits of an IT system to its workforce, such as explaining the benefits of enhanced job performance and satisfaction and promotion. Likewise, the study shows the need for more training and support to be provided to employees in the early years of business operations to engender ease of use and lessen any IT system complexity, such as perceived difficulty or lack of knowledge of IT systems. The lack of investment in training on IT skills acquisition may be a viable reason IT adoption in early years business may be failing. Therefore, to resolve this problem, the authors call for more investment in training and development of the workforce.

In terms of future research, the study recommends that the proposed research model can be applied in larger organizations and/or even non-profit businesses to test its validity and ascertain the factors that drive IT adoption. In these newly proposed settings, would the conformity construct become predateive? Would the same result of PE and EE predictive power be established? Additionally, our study contributes to a growing body of research on the dynamics and interactions of IT and cultural variables impact on

SMEs IT adoption. While our findings provided useful insights on relevant variables (performance and effort expectancies), we welcome future studies to broaden the choice of variables and their interrelations with possible IT adoption outcomes. The authors are particularly interested in the inclusion of network relationships and support services influences on SMEs adoption to IT. Based on SMEs challenges associated with deficient networking capabilities and resource utilization, would future studies, particularly qualitative research design, provide useful insights of the variables effecting SMEs IT adoption in developing countries? In addition to the possibility to extend our SMEs IT-validated model, the authors' call for further studies to examine in detail other demographics of SMEs, such as business size or industry sectors. Perhaps businesses such as IT technology companies that depend heavily on IT systems may have a stronger motivation to adopt IT than companies less dependent on IT systems, such as edible perishable food shops. Another is our call for a much larger data set, as we recognise the study sample was relatively small; therefore, there is conventional wisdom to repeat this study with a larger sample size. However, our data set falls safely within the conventional size for smooth statistical data analysis. Lastly, the authors call for a longitudinal study as a progressive next step to our cross-sectional research design. This would allow for the examination of IT adoption trends over time, provide valuable insights into the dynamic nature of IT adoption in SMEs, and help identify any changes or patterns that occur over an extended period.

Author contributions

Conceptualization, MO (Mark Ojeme) and MO (Martins Odiase); methodology, MO (Mark Ojeme) and MO (Martins Odiase); software, MO (Mark Ojeme) and MO (Martins Odiase); validation, MO (Mark Ojeme) and MO (Martins Odiase); formal analysis, MO (Mark Ojeme) and MO (Martins Odiase); investigation, MO (Mark Ojeme) and MO (Martins Odiase); resources, MO (Mark Ojeme) and MO (Martins Odiase); data curation, MO (Mark Ojeme) and MO (Martins Odiase); writing—original draft preparation, MO (Mark Ojeme) and MO (Martins Odiase); writing—review and editing, MO (Mark Ojeme) and MO (Martins Odiase); visualization, MO (Mark Ojeme) and MO (Martins Odiase); supervision, MO (Mark Ojeme) and MO (Martins Odiase); project administration, MO (Mark Ojeme) and MO (Martins Odiase); funding acquisition, MO (Mark Ojeme) and MO (Martins Odiase). All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflict of interest.

References

1. Gangwar H, Date H, Raoot AD. Review on IT adoption: insights from recent technologies. *Journal of Enterprise Information Management*. 2014, 27(4): 488-502. doi: 10.1108/jeim-08-2012-0047
2. Eze SC, Awa HO, Okoye JC, et al. Determinant factors of information communication technology (ICT) adoption by government-owned universities in Nigeria. *Journal of Enterprise Information Management*. 2013, 26(4): 427-443. doi: 10.1108/jeim-05-2013-0024
3. Kannabiran G, Dharmalingam P. Enablers and inhibitors of advanced information technologies adoption by SMEs. *Journal of Enterprise Information Management*. 2012, 25(2): 186-209. doi: 10.1108/17410391211204419
4. Tamilmani K, Rana NP, Wamba SF, et al. The extended Unified Theory of Acceptance and Use of Technology (UTAUT2): A systematic literature review and theory evaluation. *International Journal of Information Management*. 2021, 57: 102269. doi: 10.1016/j.ijinfomgt.2020.102269
5. Khazaei H. Integrating Cognitive Antecedents to UTAUT Model to Explain Adoption of Blockchain Technology Among Malaysian SMEs. *JOIV : International Journal on Informatics Visualization*. 2020, 4(2). doi: 10.30630/joiv.4.2.362

6. Anandarajan M, Igbaria M, Anakwe UP. IT acceptance in a less-developed country: a motivational factor perspective. *International Journal of Information Management*. 2002, 22(1): 47-65. doi: 10.1016/s0268-4012(01)00040-8
7. Rogers EM. *Diffusion of Innovation*, 5th ed. Free Press; 2003.
8. Davis FD. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly*. 1989, 13(3): 319. doi: 10.2307/249008
9. Davis FD, Bagozzi RP, Warshaw PR. User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*. 1989, 35(8): 982-1003. doi: 10.1287/mnsc.35.8.982
10. Venkatesh V, Morris MG, Davis GB, Davis FD. User acceptance of information technology: toward a unified view. *MIS Quarterly*. 2003, 27(3): 425. doi: 10.2307/30036540
11. Venkatesh V, Thong JYL, Xu X. Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *MIS Quarterly*. 2012, 36(1): 157. doi: 10.2307/41410412
12. Venkatesh V, Thong J, Xu X. Unified Theory of Acceptance and Use of Technology: A Synthesis and the Road Ahead. *Journal of the Association for Information Systems*. 2016, 17(5): 328-376. doi: 10.17705/1jais.00428
13. Awa OH, Ukoha O, EmechetaCB, Liu S. Using T-O-E theoretical framework to study the adoption of ERP solution. *Cogent Business & Management*. 2016, 3(1): 1196571. doi: 10.1080/23311975.2016.1196571
14. Schwartz, S. H. (1992). Universals in the content and structure of values: Theory and empirical tests in 20 countries. In: Zanna M (editor). *Advances in Experimental Social Psychology*. Academic Press. Volume 25. pp. 1-65. doi: 10.1016/S0065-2601(08)60281-6
15. Schwartz SH. Basic human values: Theory, measurement, and applications. *Revue Française de Sociologie*. 2006, 47: 249-288.
16. Schwartz SH. An Overview of the Schwartz Theory of Basic Values. *Online Readings in Psychology and Culture*. 2012, 2(1). doi: 10.9707/2307-0919.1116
17. Bagchi KK, Udo GJ, Kirs PJ, et al. Internet use and human values: Analyses of developing and developed countries. *Computers in Human Behavior*. 2015, 50: 76-90. doi: 10.1016/j.chb.2015.03.055
18. Abunadi I. Influence of Culture on e-Government Acceptance in Saudi Arabia [PhD thesis]. Griffith University; 2012.
19. Choden K, Bagchi K, Udo G, Kirs P. Do Schwartz's value types matter in internet use of individual developing and developed nations? In: *Proceedings of the Sixteenth Americas Conference on Information Systems*; 12-15 August 2010; Lima, Peru. pp. 1-11.
20. Bagchi K, Kirs P. The impact of Schwartz's cultural values type on ICT use: A multi-national individual-level analysis. In: *Proceedings of the International Conference on Information Systems*; 15-18 December 2009; Phoenix, Arizona, USA.
21. Ogba I. Commitment in the workplace. *Management Research News*. 2008, 31(11): 867-878. doi: 10.1108/01409170810913051
22. Binder CC. Redistribution and the Individualism–Collectivism Dimension of Culture. *Social Indicators Research*. 2019, 142: 1175-1192. doi: 10.1007/s11205-018-1964-6
23. Williams MD, Rana NP, Dwivedi YK. The unified theory of acceptance and use of technology (UTAUT): a literature review. *Journal of Enterprise Information Management*. 2015, 28(3): 443-488. doi: 10.1108/jeim-09-2014-0088
24. Alalwan AA, Dwivedi YK, Rana NP, et al. Examining factors influencing Jordanian customers' intentions and adoption of internet banking: Extending UTAUT2 with risk. *Journal of Retailing and Consumer Services*. 2018, 40: 125-138. doi: 10.1016/j.jretconser.2017.08.026
25. Moghavvemi S, Mohd Salleh NA, Zhao W, et al. The entrepreneur's perception on information technology innovation adoption: An empirical analysis of the role of precipitating events on usage behavior. *Innovation*. 2012, 14(2): 231-246. doi: 10.5172/impp.2012.14.2.231
26. Bu F, Wang N, Jiang B, et al. Motivating information system engineers' acceptance of Privacy by Design in China: An extended UTAUT model. *International Journal of Information Management*. 2021, 60: 102358. doi: 10.1016/j.ijinfomgt.2021.102358
27. Agwu ME. Relevance of Information Technology in The Effective Management of Selected SMEs in Lagos State Nigeria. *Academy of Strategic Management Journal*, 2018, 17(1): 1-15.
28. Wu W, Wu YJ, Wang H. Perceived city smartness level and technical information transparency: The acceptance intention of health information technology during a lockdown. *Computers in Human Behavior*. 2021, 122: 106840. doi: 10.1016/j.chb.2021.106840
29. Wang Y, Tseng M, Tsai H. A study of Taiwanese college teacher's acceptance of distance learning. *International Journal of Organizational Innovation*. 2010, 3(2): 243-260.

30. Yuen YY, Yeow PH, Lim N, Saylani N. Internet Banking Adoption: Comparing Developed and Developing Countries. *Journal of Computer Information Systems*. 2010, 51(1): 52-61.
31. Kijisanayotin B, Pannarunothai S, Speedie SM. Factors influencing health information technology adoption in Thailand's community health centers: Applying the UTAUT model. *International Journal of Medical Informatics*. 2009, 78(6): 404-416. doi: 10.1016/j.ijmedinf.2008.12.005
32. Riffai MMMA, Grant K, Edgar D. Big TAM in Oman: Exploring the promise of on-line banking, its adoption by customers and the challenges of banking in Oman. *International Journal of Information Management*. 2012, 32(3): 239-250. doi: 10.1016/j.ijinfomgt.2011.11.007
33. Martins C, Oliveira T, Popovič A. Understanding the Internet banking adoption: A unified theory of acceptance and use of technology and perceived risk application. *International Journal of Information Management*. 2014, 34(1): 1-13. doi: 10.1016/j.ijinfomgt.2013.06.002
34. Yi-Shun W, Shih, Y. Why do people use information kiosks? A validation of the Unified Theory of Acceptance and Use of Technology. *Government Information Quarterly*. 2009, 26(1): 58-165. doi: 10.1016/j.giq.2008.07.001
35. Moore GC, Benbasat I. Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation. *Information Systems Research*. 1991, 2(3): 192-222. doi: 10.1287/isre.2.3.192
36. Thompson RL, Higgins CA, Howell JM. Personal Computing: Toward a Conceptual Model of Utilization. *MIS Quarterly*. 1991, 15(1): 125. doi: 10.2307/249443
37. Bardi A, Schwartz SH. Values and Behavior: Strength and Structure of Relations. *Personality and Social Psychology Bulletin*. 2003, 29(10): 1207-1220. doi: 10.1177/0146167203254602
38. Hofstede G, Hofstede GJ, Minkov M. *Cultures and Organizations: Software of the Mind: Intercultural Cooperation and Its Important for Survival*, 3rd ed. McGraw-Hill; 2010.
39. Srite M, Karahanna E. The Role of Espoused National Cultural Values in Technology Acceptance. *MIS Quarterly*. 2006, 30(3): 679. doi: 10.2307/25148745
40. Fishbein M, Ajzen I. *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*. Addison-Wesley; 1975.
41. Schwartz SH, Melech G, Lehmann A, et al. Extending the Cross-Cultural Validity of the Theory of Basic Human Values with a Different Method of Measurement. *Journal of Cross-Cultural Psychology*. 2001, 32(5): 519-542. doi: 10.1177/0022022101032005001
42. Baishya K, Samalia HV. Extending unified theory of acceptance and use of technology with perceived monetary value for smartphone adoption at the bottom of the pyramid. *International Journal of Information Management*. 2020, 51: 102036. doi: 10.1016/j.ijinfomgt.2019.11.004
43. Patil P, Tamilmani K, Rana NP, et al. Understanding consumer adoption of mobile payment in India: Extending Meta-UTAUT model with personal innovativeness, anxiety, trust, and grievance redressal. *International Journal of Information Management*. 2020, 54: 102144. doi: 10.1016/j.ijinfomgt.2020.102144
44. Hardesty DM, Bearden WO. The use of expert judges in scale development. *Journal of Business Research*. 2004, 57(2): 98-107. doi: 10.1016/s0148-2963(01)00295-8
45. Churchill GA. A Paradigm for Developing Better Measures of Marketing Constructs. *Journal of Marketing Research*. 1979, 16(1): 64-73. doi: 10.1177/002224377901600110.
46. National Bureau of Statistics and Small and Medium Enterprises Development Agency of Nigeria. Available online: [http://smedan.gov.ng/images/NATIONAL%20SURVEY%20OF%20MICRO%20SMALL%20&%20MEDIUM%20ENTERPRISES%20\(MSMES\),%20%202017%201.pdf](http://smedan.gov.ng/images/NATIONAL%20SURVEY%20OF%20MICRO%20SMALL%20&%20MEDIUM%20ENTERPRISES%20(MSMES),%20%202017%201.pdf) (accessed on 20 April 2018).
47. Podsakoff PM, MacKenzie SB, Lee JY, et al. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*. 2003, 88(5): 879-903. doi: 10.1037/0021-9010.88.5.879
48. Atiase VY, Mahmood S, Wang Y, et al. Developing entrepreneurship in Africa: investigating critical resource challenges. *Journal of Small Business and Enterprise Development*. 2017, 25(4): 644-666. doi: 10.1108/jsbed-03-2017-0084
49. Modina M, Pietrovito F. A default prediction model for Italian SMEs: the relevance of the capital structure. *Applied Financial Economics*. 2014, 24(23): 1537-1554. doi: 10.1080/09603107.2014.927566
50. Anderson JC, Gerbing DW. Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*. 1988, 103(3): 411-423. doi: 10.1037/0033-2909.103.3.411
51. Hair JF, Anderson RE, Tatham RL, Black WC. *Multivariate Data Analysis*, 7th ed. Prentice Hall; 2010.
52. Bagozzi RP, Yi Y. On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*. 1988, 16(1): 74-94. doi: 10.1007/bf02723327
53. Tabachnick GB, Fidell SL. *Using Multivariate Statistics*, 6th ed. Pearson; 2013.
54. Field A. *Discovering Statistics Using IBM SPSS Statistics*, 4th ed. Sage; 2013.

55. Farrell AM. Insufficient discriminant validity: A comment on Bove, Pervan, Beatty, and Shiu (2009). *Journal of Business Research*. 2010, 63(3): 324-327. doi: 10.1016/j.jbusres.2009.05.003
56. Alwahaishi S. An empirical analysis of end user's adoption of ICT in a developing country. *International Journal of Digital Information and Wireless Communications*. 2015; 5(2).
57. Venkatesh V, Zhang X. Unified Theory of Acceptance and Use of Technology: U.S. Vs. China. *Journal of Global Information Technology Management*. 2010, 13(1): 5-27. doi: 10.1080/1097198x.2010.10856507
58. Schwartz SH. Basic values: How they motivate and inhibit prosocial behavior. In: Mikulincer M, Shaver PR (editors). *Prosocial Motives, Emotions, and Behavior: The Better Angels of Our Nature*. American Psychological Association; 2010. pp. 221-241. doi: 10.1037/12061-012