https://dx.doi.org/10.4314/dujopas.v9i1a.12
ISSN (Print): 2476-8316
ISSN (Online): 2635-3490

Dutse Journal of Pure and Applied Sciences (DUJOPAS), *Vol. 9 No. 1a March 2023*

Acceptance of IoT Technology among Students and Staff of Tertiary Institutions in Kaduna State, Nigeria

[1]Abraham E. Evwiekpaefe, [2]Oghenegueke F. Amrevuawho

[1,2]Department of Computer Science,
Nigerian Defence Academy, Kaduna state

Email: aeevwiekpaefe@nda.edu.ng

Abstract

The Internet of Things (IoT) refers to the billions of physical devices that are now connected to the internet, collecting and sharing data all over the world. IoT has permeated almost every aspect of human life in recent times, encompassing cities, houses, tertiary institutions, production plants, businesses, agriculture, hospitals, and medical centers. Africa is currently experiencing a delayed adoption of technology particularly IoT technology in the educational sector. Nigeria has immense IoT potential. If it is properly implemented, will likely result in enhanced productivity across all economic sectors, and a higher standard of living for the people. The impact of IoT in Nigeria, however, is not obvious this could likely be due to poor knowledge, poverty, insufficiency and lack of electricity especially in rural areas, religion, corruption, government policy, and the like. User acceptability is essential for the successful adoption of any information technology (IT) or information system. This study investigated the behavioral intentions of students and staff at tertiary institutions in Kaduna metropolis to adopt IoT technology for educational purposes. Also to check how strong the Unified Theory of Acceptance and Use of Technology (UTAUT) predictors were in predicting students and staff willingness to embrace IoT technology. The data was collected from 300 respondents through the use of an online questionnaire (google form). SPSS 25 and AMOS 26 were the statistical tools utilized to capture and evaluate the questionnaire data. Based on the research theoretical model and the research hypothesis, the empirical findings suggest that the factors of Performance Expectancy, Effort Expectancy, and Facilitating Condition positively influence Behavioral Intentions to use IoT technology, whereas Social Influence has no positive influence on Behavioral Intentions to use IoT technology for educational purposes in tertiary institutions in Kaduna state metropolis.

Keywords: Acceptance of IoT, Internet of Things, Kaduna State, Tertiary Institutions, UTAUT

INTRODUCTION

The Internet of Things (IoT) is a network of computational devices, mechanical and digital equipment, products, animals, and individuals that have private identification and can communicate data without requiring human-to-human or human-to-computer interaction (Aeris, 2021). The concept of linked devices dates back to 1832 when the first electromagnetic telegraph was created. The telegraph allowed for instant communication between devices via the transmission of electrical signals. Nevertheless, the historical truth of IoT began with the advent of the internet—a major element in the 19th century that subsequently grew significantly over the next generations (Khvoynitskaya, 2021). Kevin Ashton, a British technology innovator who co-founded the Auto-ID Center at the Massachusetts Institute of

**Author for Correspondence*

Technology, coined the term "Internet of Things" (IoT) around the year 1999. (Al-Fuqaha *et al.,* 2015).

On April 13, 2010, Hans Vestberg, one-time CEO and President of Ericsson, claimed that 50 billion connected devices would exist by 2020. The goal of 50 billion devices to be connected may not have come true as Vestberg predicted in 2010, as Ericsson revised its projection to 26 billion devices by 2020 in 2015. (Ericsson, 2015). The Internet of Things (IoT) converts things into data using intelligent sensing equipment, which sends data through wired or wireless networks, and afterward stores, evaluates and transmits the information using cloud computing. The Internet of Things (IoT) has permeated almost every aspect of human life in recent times, encompassing cities, houses, universities, production plants, businesses, agriculture, hospitals, and medical centers (Kim *et al.,* 2017).

In comparison to other continents, Africa is currently experiencing a delayed adoption of technology particularly IoT technology in the educational sector. Nigeria, as the world's largest mobile market and the continent's most populous country, has immense IoT potential, which, if properly implemented, will likely result in enhanced productivity across all economic sectors and improve the standard of living for the people (Ndubuaku & Okereafor, 2015). The impact of IoT in Nigeria, however, is not obvious. This could likely be due to poor knowledge, analphabetism, lack of electricity especially in rural areas, religion, corruption, government policy, and the like (Bamigboye & Ademola, 2016).

Iwayemi (2018) examine IoT implementation challenges in Nigeria. They used secondary data and also administered questionnaire to collect information from professionals. The data collected was evaluated using Statistical Packages for Social Sciences (SPSS). They identified Fraud, Power supply, Religion, Technical Know-how of how to implement IoT, Cost of Implementing IoT, Tools, equipment, and other raw materials necessary for carrying out IoT, Nigeria Government, Cyber-attacks, Privacy, Security, and fear of Job loss/Joblessness as factors challenging the implementation of IoT in Nigeria.

Bamigboye & Ademola (2016) identified the role IoT will play in enhancing farming in Nigeria through its relevance in the area of weather forecast, irrigation/fertilizer application, tracking of farm produce, internet banking, pests and disease control and monitoring. They also noted that Nigerian agriculture must be worked on through the provision of modern internet-based equipment/facilities and training to obtain improved productivity as attained in developed countries.

Ndubuaku & Okereafor (2015) looked at the current state of IoT deployment in Nigeria, the challenges faced, and the opportunities that abound. They concluded that Nigeria is still faced with challenges in many sectors of the economy and that IoT can go a long way to alleviate specific problems and help improve economic performance and social wellbeing.

Almetere *et al.* (2020) evaluated the relevant elements of UTAUT and their connections to the adoption of IoT technology in the education domain among Saudi public university undergraduate students. The goal of this study was to develop a framework for increasing IoT acceptability using UTAUT. The research was conducted using a quantitative method. The data was analyzed using Partial Least Square-Structural Equation Modelling (PLS-SEM). The study's goal was fulfilled by implementing the researcher's recommended framework model, which enhanced IoT acceptance in Saudi Arabian higher education.

Abed *et al.* (2020) evaluated how the IoT is affecting the educational environment. It also investigated user adoption of this technology at Saudi universities and educational institutions, utilizing the Technology Acceptance Model to encourage them to use it. The findings revealed that the Internet of Things has had a good impact on the educational process and university campuses in general. The researchers used a questionnaire to gather data and TAM model variables to evaluate the acceptance and discover the possibilities of advancing toward IoT technology in Saudi educational environments. The questionnaire was designed to collect information from students, teachers, and employees in all educational settings in Saudi Arabia using an electronic form that must be completed to be counted. The statistical measures were computed using Statistical Packages for Social Sciences (SPSS).

Majeed & Ali (2018) proposed a concept for creating a smart campus at a university using IoT technologies. The study looked into creating smart classrooms and campuses through the usage of IoT applications. The IoT paradigm is separated into various components that define the long-term impact on campuses and classrooms. These technologies have established a new link between educational settings and students to deliver important information. The application of IoT in education was divided into several categories, including classroom access control, increasing teaching and learning, monitoring students' healthcare, real-time eco-system management, and energy management.

Ayaz & Yanartas (2020) analyzed using the unified theory of acceptance and use of technology theory (UTAUT) the acceptance of electronic document management system (EDMS). The study investigated the factors that influence the adoption and use of EDMS at Bartn University. The data in this study were analyzed using the R software package and Structural Equation Modelling (SEM). According to the findings, the suggested model explains 61% of the intention to use EDMS by performance expectancy and social influence factors. The empirical data indicate that the factors of performance expectancy and social influence have a favorable effect on the intention to use, while the factor of effort expectancy does not.
This study investigated the behavioral intentions of students and staff at tertiary institutions in Kaduna metropolis to adopt and use IoT technology for educational purposes.

METHODOLOGY

The data was acquired using online survey, which can be used to collect both quantitative and qualitative data. It was captured and evaluated using the statistical tools SPSS 25 and AMOS 26. The goal of this study was to see how strong the Unified Theory of Acceptance and Use of Technology (UTAUT) predictors Effort Expectancy, Performance Expectancy, Social Influence and Facilitating Condition (EE, PE, SI, and FC) were in predicting students and staff' willingness to accept IoT technology for educational purposes. Figure 1 depicts the parameters that may influence IoT acceptability by students and staff in tertiary institutions in Kaduna state metropolis. The analysis is based on the model proposed by Venkatesh et al. (2003), but with some modifications which includes four exogenous variables, and one endogenous variable, nevertheless, one endogenous variable and the moderating variables were not included in this study.

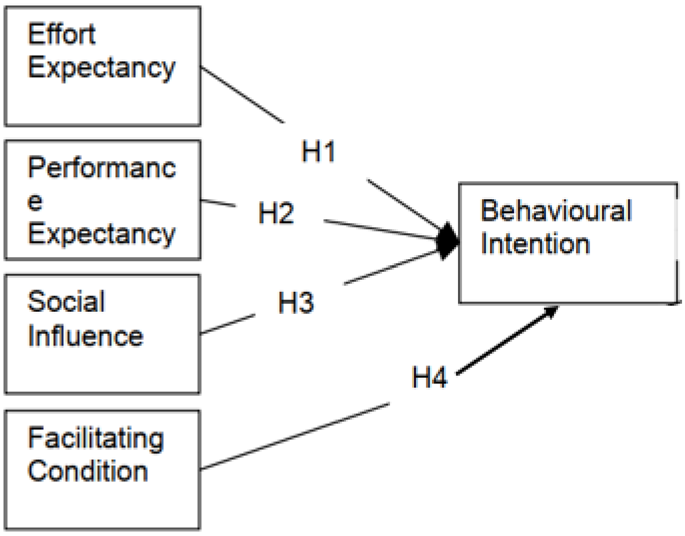

Figure 1: Theoretical framework of hypotheses (Author , 2021).

Performance Expectancy

Performance expectancy is a reliable predictor of behavioral intention in the context of technology adoption and usage (Lee & Shin, 2019). According to Lee and Shin (2019), performance expectancy is defined as the degree to which a user expects that adopting a technology would result in advantages. Performance expectancy in the context of IoT refers to the degree to which students and staff believe that employing IoT technologies would improve their productivity and performance. In other words, consumers will use technology if they believe it would improve their performance.

H1. Performance expectancy positively affect students and staff behavioral intention to use IoT.

Effort Expectancy

Effort Expectancy is the degree of ease connected with the use of technology, and earlier research has proven that EE is a key predictor of technology use intention (Tosuntaş, *et al.*, 2015). According to Prasad and Arthanar (2017), there is a larger possibility that consumers will adopt technologies if they are understandable and easy to use. Chipeva *et al.* (2018) found this to be true in their research in Bulgaria and Portugal. As a result, in the context of IoT, students will be able to use record class attendance technology if they believe it will save them time and help them comprehend the system. According to Lee and Shin (2019), the more effort customers expend to use IoT technology, the less likely they are to use and accept this technology.

H2: Effort expectancy positively affect students and staff behavioral intentions to use IoT

Social Influence (SI)

SI is the extent to which a person believes important individuals believe he or she should use the new system. SI refers to the student's perception that influential individuals believe he or she should employ new technology (Ayaz & Yanartaş, 2020). For this study, students' friends' and family members' opinions can impact their use and adoption of new technology. Social influence plays a vital function in the Internet-based banking industry (Rahi & Abd. Ghani, 2018; Wang *et al.*, 2015).

H3: Social Influence conditions positively affect behavioral intentions of students and staff to use IoT.

Facilitating Condition (FC)

According to Venkatesh (2003), facilitating conditions are the extent to which an individual believes that an organizational and technical infrastructure exists to facilitate system use. Venkatesh (2003) and (Handayani & Sudiana, 2017) found that the facilitating condition has a substantial impact on technology in the context of usage behavior. According to Wang *et al.* (2018), technical support such as computers, internet speed, and interaction with other systems all have a role in the acceptance and usage of technology. In the context of internet banking, Lee (2009) backed the same statement by mentioning that the user's knowledge, competence, and resources have an impact on the use of technology. Technology adoption is linked to having digital abilities, and a lack of these skills would make it difficult for students to use IoT. (Bartau-Rojas *et al.,* 2018). However, several pieces of research have indicated that facilitating conditions have little effect on usage behavior.

H4: Facilitating conditions directly affect students and staff behavioral intention to use IoT.

RESULTS AND DISCUSSION

From the UTAUT deciding criteria on the acceptability of IoT technology among students and staff of tertiary institutions in Kaduna metropolis, the performance expectancy, effort expectancy, social influence, and facilitating condition was shown to have significant effect on behavioral intention.

300 students and staff from the Nigerian Defence Academy (NDA), Kaduna State University (KASU), Kaduna Polytechnic (KADPOLY) and Ahmadu Bello University (ABU) took part in the survey. Gender, age, current education level, and IoT device usage were among the personal questions asked of participants. As seen in Table 1. 80.3% are students while 19.7% are staff. 64.0% are male while 36.0% are female. 29.0% are from NDA, 53.3% from KASU, 10.3% from KADPOLY, and 7.3% are from other tertiary institutions. 3.3% are 100l students, 30.0% are 200l students, 17.0% are 300l students, 16.7% are 400l students, 13.3% are postgraduate students and 19.7% are staff. 94.7% of the student and staff uses IoT devices both by personal acquisition and provision by their various institutions. The result also shows that 5.3% of the student and staff are not sure if they have used IoT devices before either by personal acquisition or provided by the institution. Results demonstrate that a larger population of students and staff of tertiary institutions in Kaduna state metropolis uses IoT devices compare to those ignorant of it.

Table 1: Respondents' Demographic Data (N=300)

CHARACTER	FREQUENCY	PERCENT
Students	241	80.3
Staff	59	19.7
Male	192	64.0
Female	108	36.0
18-25 years	85	28.3
25-30 years	58	19.3
30-35 years	101	33.7
35-40 years	46	15.3
40 years -above	10	3.3
NDA	87	29.0
KASU	160	53.3
KADPOLY	31	10.3
ABU	22	7.3
100L students	10	3.3
200L students	90	30.0
300L students	51	17.0
400L students	50	16.7
Postgraduate students	40	13.3

Staff	59	19.7
IoT devices users	284	94.7
Not using IoT devices	16	5.3

Analysis of measurement model

Hair et al. (2010) state that structural equation modeling data analysis consists of two main steps. These procedures comprise the evaluation of the measurement model and the construction of the structural model. Using the UTAUT methodology to assess IoT acceptance among students and staff. The first stage is to examine the measurement model, which includes determining convergent and discriminant validity. The next stage is to evaluate the structural model to determine the strength and direction of the links between the constructs. Factor loadings must be at least 0.5 and preferably 0.7 for a satisfactory measurement indication, the minimal threshold for construct reliability must be 0.7, and the average variance extracted for each construct must equal or exceed 0.5.

Measurement of reliability and construct validity

The AMOS 26 statistical program was used to assess the measurement instrument's construct validity and reliability. The construct reliability CR and average variance extracted (AVE) were measured using the two equations shown below.

CR= (∑ factor loading)2 / ((∑ factor loading)2 + ∑ measurement error)
(Eq. 1)

AVE= ∑ (factor loading)2/N
(Eq. 2)

The AVE was calculated to test the convergent validity. Table 2 displays the results of factor loadings, construct reliability, average variance extracted, and Cronbach's Alpha, which provides adequate evidence of validity and reliability because factor loadings exceed 0.5 in most of the constructs and all but one of the construct reliability figures exceed the recommended level of 0.7 except for facilitating conditions.

Table 2: Standard item loadings, Construct Reliability, Average Variance Extracted and Cronbach's Alpha

Constructs	Indicators	Factor Loadings (> 0.707)	Construct Reliability (CR) (> 0.7)	Average Variance Extracted (AVE) (> 0.5)	Cronbach's Alpha (> 0.7)
Performance	PE1	0.765			
Expectancy (PE)	PE2	0.789	0.803	0.576	0.790
	PE3	0.722			
Effort	EE1	0.808			
Expectancy (EE)	EE2	0.846	0.800	0.577	0.783
	EE3	0.602			
Social	SI1	0.76			
Influence (SI)	SI2	0.731	0.596	0.380	0.483
	SI3	0.168			
Facilitating	FC1	0.633			
Condition (FC)	FC2	0.87	0.799	0.573	0.793
	FC3	0.75			
Behavioral	BI1	0.835			
Intention (BI)	BI2	0.828	0.811	0.592	0.798
	BI3	0.628			

The researchers evaluated the structural model using the concepts provided by Hair *et al.* (2010). Who suggested that it is best to utilize at least one absolute and one incremental fit measure, in addition to chi-square and the associated degrees of freedom, to assess a model's fitness. Previously, experts advocated the following cut off for model evaluation: χ2/df <3 (Bagozzi & Yi, 1988), AGFI > 0.8 (Chau & Hu, 2001), RMSEA.08 (Brown & Cudeck, 1992), CFI >0.9 (Bagozzi & Yi, 1988), NFI > 0.9 (Bagozzi & Yi, 1988). Table 3 contains a list of model fit indices, recommended threshold values, and corresponding authors, as well as the paper's fit indices that fall within the acceptable range. As a result, the result demonstrated that the measurement model corresponded to the data gathered.

Table 3: Recommended and actual values of fit Indices

Fit Indices	Recommended Value	Actual Values	Authors
χ2/df	<3	2.015	(Bagozzi & Yi, 1988)
AGFI	>0.8	0.901	(Chau & Hu, 2001)
RMSEA	<0.08	0.058	(Browne & Cudeck, 1992)
NFI	>0.9	0.912	(Chin & Todd, 1995)
CFI	>0.9	0.953	(Bagozzi & Yi, 1988)

DISCUSSION

Using the UTAUT model, this research attempted to provide a deeper understanding of the difficulties surrounding the acceptance of the Internet of Things (IoT) by students and staff of tertiary institutions in Kaduna state. According to the findings of this study, the factors Performance Expectancy, Effort Expectancy, and Facilitating Condition have a substantial influence on students' and staff's Behavioral Intention to utilize IoT technology. This outcome is consistent with the original research hypotheses of Venkatesh et al. (2003). The influence of the other concept SI on behavioral intentions to use IoT was statistically insignificant, contradicting the original authors' hypotheses.

The estimate is the standardized regression coefficient; S.E is the standardized error; C.R. is the critical region and P is the significant level. Using the UTAUT approach to assess students and staff acceptance of IoT the findings of the Structural Modeling Analysis are shown in Figure 2. The results of Table 4, as shown in Figure 2, clearly indicate that, regardless of the performance or usefulness of IoT technology, students and faculty at tertiary institutions will accept IoT if it is made available for educational purposes when the necessary support and facilities are available. The findings also imply that tertiary institution administrators should educate students on the value of IoT if it is available.

Table 4: Relationship between exogenous and endogenous variables

Path	Estimate	S.E.	C.R.	P	Comment
BI <--- PE	0.334	0.093	3.599	***	Sig.
BI <--- EE	0.374	0.142	2.634	0.008	Sig.
BI <--- SI	0.380	0.263	1.444	0.149	Not sig.
BI <--- FC	0.056	0.028	2.001	0.045	Sig.

The associations between the exogenous factors, Effort Expectancy, Performance Expectancy, Social Influence, and Facilitating Conditions, and the endogenous variable, behavioral Intention, are shown in Table 4 and Figure 2. Performance Expectancy strongly influenced behavioral Intention (0.00 p.05), Effort Expectancy and Facilitating Conditions also significantly influenced behavioral intention (0.008 p<05) and (0.45, p<05), respectively. The remaining associations were all statistically insignificant. Students' and staff members' intentions to utilize IoT for learning and lecturing increase by 0.00, 0.008, and 0.45 for every unit increase in Performance Expectancy, Effort Expectancy, and Facilitating condition, respectively. The study's findings indicate that when Facilitation Conditions improve, students and staff will adopt IoT for learning and lecturing if it is available. Students and staff can expect assistance from professionals as well as training on how to operate the equipment.

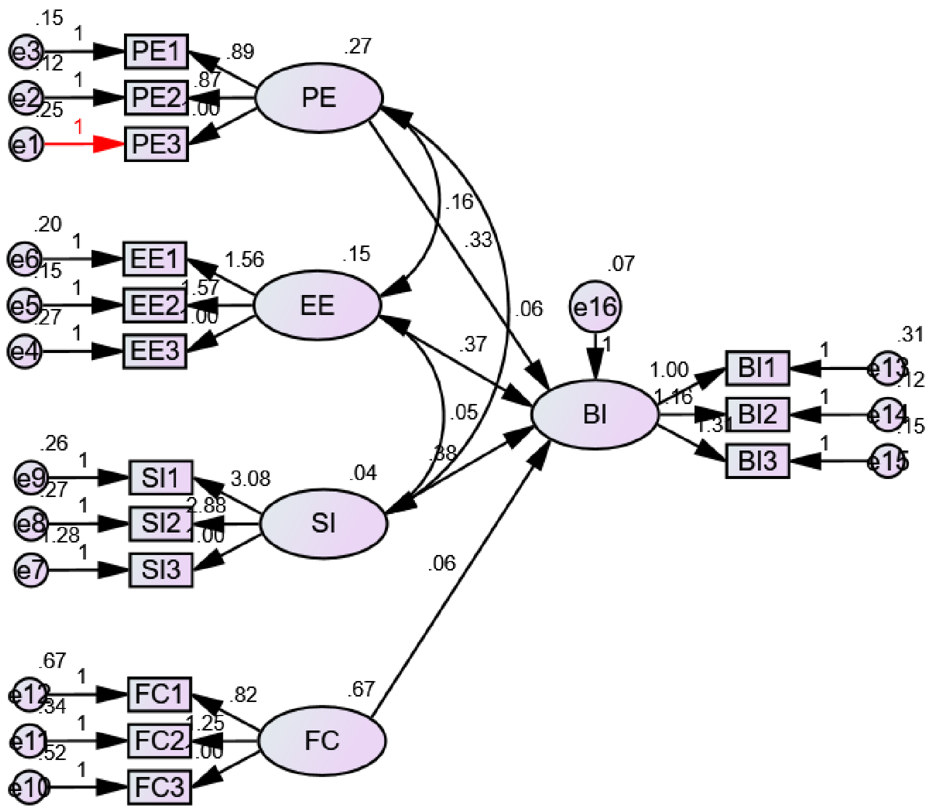

Figure 2: Structural Equation Model (SEM)

CONCLUSION

This study gives insights into students and staff members' behavioral intentions toward IoT technology acceptance in tertiary institutions in Kaduna metropolis, and the UTUAT model was modified and used. The study concludes that of the hypotheses stated, Performance Expectancy, Effort Expectancy, and Facilitating Condition positively influence Behavioral Intentions to use IoT technology for learning by students and lecturing by staff in tertiary institutions in Kaduna state, whereas Social Influence has no positive influence on Behavioral Intentions to use IoT technology for learning and teaching.

This paper used only the students and staff of tertiary institutions in Kaduna metropolis. It did not address the effect of the moderating variables presented in the original UTAUT model. The researchers, therefore, recommend that future studies should include students from other tertiary institutions in Kaduna state and Nigeria at large for more reliable results and conclusions. The study also recommends including other variables to improve the variance explained by the predictors, since there are variations in the research environments.

REFERENCES

Abed, S., Alyahya, N. and Altameem, A., 2020. IoT in education: Its impacts and its future in saudi universities and educational environments. In *First International Conference on Sustainable Technologies for Computational Intelligence* (pp. 47-62). Springer, Singapore.

Aeris (2021). What is IoT? Defining the Internet of Things (IoT): It's All about Data. [Online] Available from: https://www.aeris.com/in/what-is-iot/ [Accessed 20th September 2021].

Al-Fuqaha, A., Guizani, M., Mohammadi, M., Aledhari, M. and Ayyash, M., 2015. Internet of things: A survey on enabling technologies, protocols, and applications. *IEEE communications surveys & tutorials*, *17*(4), pp.2347-2376.

Almetere, E.S., Kelana, B.W.Y. and Mansor, N.N.A., 2020. Using UTAUT model to determine factors affecting internet of things acceptance in public universities. *International Journal of Academic Research in Business and Social Sciences*, *10*(2), pp.142-150.

Ayaz, A. & Yanartaş, M., 2020. An analysis on the unified theory of acceptance and use of technology theory (UTAUT): Acceptance of electronic document management system (EDMS). *Computers in Human Behavior Reports*, *2*, p.100032.

Bagozzi, R.P. and Yi, Y., 1988. On the evaluation of structural equation models. *Journal of the academy of marketing science*, *16*(1), pp.74-94.

Bamigboye, F.O. and Ademola, E.O., 2016. Internet of Things (Iot): It's application for sustainable agricultural productivity in Nigeria.

Bartau-Rojas, I., Aierbe-Barandiaran, A. and Oregui-González, E., 2018. Parental mediation of the Internet use of Primary students: Beliefs, strategies and difficulties.

Browne, M.W. and Cudeck, R., 1992. Alternative ways of assessing model fit. *Sociological methods & research*, *21*(2), pp.230-258.

Chau, P.Y. and Hu, P.J.H., 2001. Information technology acceptance by individual professionals: A model comparison approach. *Decision sciences*, *32*(4), pp.699-719.

Chin, W.W. and Todd, P.A., 1995. On the use, usefulness, and ease of use of structural equation modeling in MIS research: A note of caution. *MIS quarterly*, pp.237-246.

Chipeva, P., Cruz-Jesus, F., Oliveira, T. and Irani, Z., 2018. Digital divide at individual level: Evidence for Eastern and Western European countries. *Government Information Quarterly*, *35*(3), pp.460-479.

Ericson 2015 Ericsson Mobility Report: 70 percent of the world's population using smartphones by 2020. [Online] Available from: https://www.ericsson.com/en/pressreleases/2015/6/ericssonmobilityreport-70-percent-of-worlds-population-using-smartphones-by-2020 [Accessed 20th September 2021].

Hair, J.F., Anderson, R.E., Babin, B.J. and Black, W.C., 2010. Multivariate data analysis: A global perspective (Vol. 7).

Handayani, T. and Sudiana, S., 2015. Analisis penerapan model UTAUT (Unified Theory of Acceptance and Use of Technology) terhadap perilaku pengguna sistem informasi (studi kasus: sistem informasi akademik pada STTNAS Yogyakarta). *Angkasa: Jurnal Ilmiah Bidang Teknologi*, *7*(2), pp.165-180.

Iwayemi, A., 2018. Internet of things: Implementation challenges in Nigeria. *American Journal of Engineering Research*, *7*(12), pp.105-115.

Khvoynitskaya, S. 2021. The IoT history and future: The brief history of the internet of things. Itransition. [Online] Available from: https://www.itransition.com/blog/iot-history [Accessed 20th September 2021]

Kim, T.H., Ramos, C. and Mohammed, S., 2017. Smart city and IoT. *Future Generation Computer Systems*, *76*, pp.159-162.

Lee, H.Y. and Ahn, H.C., 2009. A study on EC acceptance of virtual community users. *Asia pacific journal of information systems*, *19*(1), pp.147-165.

Lee, W. and Shin, S., 2019. An empirical study of consumer adoption of Internet of Things services. *Int. j. eng. technol. innov*, *9*(1), pp.1-11.

Majeed, A. and Ali, M., 2018, January. How Internet-of-Things (IoT) making the university campuses smart? QA higher education (QAHE) perspective. In *2018 IEEE 8th Annual Computing and Communication Workshop and Conference (CCWC)* (pp. 646-648). IEEE.

Marr, N.E. and Prendergast, G.P., 1991. Strategies for retailing technologies at maturity: a retail banking case study. *Journal of International Consumer Marketing*, *3*(3), pp.99-125.

Ndubuaku, M. and Okereafor, D., 2015. State of Internet of Things deployment in Africa and its future: The Nigerian scenario. *The African Journal of Information and Communication*, *2015*(15), pp.114-119.

Prasad, G. and Arthanar, A., 2017. Customer Satisfaction on Banking Channels. *International Journal of Marketing Research Innovation*, *1*(1), pp.8-15.

Rahi, S. and Ghani, M.A., 2018. The role of UTAUT, DOI, perceived technology security and game elements in internet banking adoption. *World Journal of Science, Technology and Sustainable Development*.

Tosuntaş, Ş.B., Karadağ, E. and Orhan, S., 2015. The factors affecting acceptance and use of interactive whiteboard within the scope of FATIH project: A structural equation model based on the Unified Theory of acceptance and use of technology. *Computers & Education*, *81*, pp.169-178.

Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D., 2003. User acceptance of information technology: Toward a unified view. *MIS quarterly*, pp.425-478.

Wang, S.W., Ngamsiriudom, W. and Hsieh, C.H., 2015. Trust disposition, trust antecedents, trust, and behavioral intention. *The Service Industries Journal*, *35*(10), pp.555-572.

Wang, Y., Han, J.H. and Beynon-Davies, P., 2018. Understanding blockchain technology for future supply chains: a systematic literature review and research agenda. *Supply Chain Management: An International Journal*.