

STRATEGIES TO CURB CORRUPTION AND PROBLEMS OF INSECURITY IN NIGERIA: A TECHNOLOGICAL VIEWPOINT

Felix Chukwuma, Aguboshim, PhD

*Department of Computer Science
Federal Polytechnic, Oko Nigeria.
felixaguboshim@gmail.com*

Obiokafor, Ifeyinwa Nkemdilim

*Department of Computer Science Technology
Anambra State Polytechnic, Mgbakwu, Nigeria
ifykems@gmail.com*

&

Amulu, Hillary Uchenna

*British spring College Awka, Nigeria
hillardo101@gmail.com*

DOI: 10.13140/RG.2.2.13367.34720

Abstract

Nigeria is ranked second 'most corrupt' Economic Community of West African States (ECOWAS) country on Transparency International (TI) corruption index and 146 on Global Corruption Index in 2019. Effective adoption of Information and Communication Technology (ICT) has significant importance in curbing corruption, and has increasingly been advocated as a solution to deal with corruption and insecurity problems. However, effective adoption of ICT has remained crippled due to poor ICT policies and practices, poor data governance, e-governance and ignorance. ICT innovations that may effectively mediate corruption are further hindered by high illiteracy rate among Nigerians, given at 40.33%. The purpose of this study was to identify strategies for ICT adoption and usage for dealing effectively with corruption and insecurity problems. The Technology Acceptance Model (TAM) was adopted as the study conceptual framework. In this study, the authors explored a narrative review, analysis, and synthesis of prior research that revealed significant information on how effective ICT adoption and usage can curb corruption and insecurity problems. Peer-reviewed articles within the last five years were extracted from electronic databases. Results revealed that strict adherence to ICT policies and adoption coupled with good formulation and communication of same, are the major impact for curbing corruption and insecurity problems. The result from this study may increase understanding, minimize corrupt practices and encourage trust in ICT adoption, acceptance and sustainability that can positively curb corruption and insecurity problems in Nigeria.

Keywords: Corruption, Insecurity Problems, ICT, adoption, ICT sustainability.

Introduction

Nigeria is ranked second 'most corrupt' Economic Community of West African States (ECOWAS) country on Transparency International (TI) corruption index and 146 on Global Corruption Index in 2019 (TI, 2020). The word corruption is a universal challenge and not native to Nigeria. However Nigeria has remained a corrupt nation because Information and Communication Technology (ICT) which mediates corruption as evident in some developed countries, has not been adopted according to standards in Nigeria. Globally, ICT has been recommended as a tool to curb corruption and insecurity problems (Wickberg, 2013), by simplifying the process of collecting digital facts and figures that could provide substantial evidences to detect corrupt practices (Krishnan, Teo, & Lim, 2013). Unfortunately, the same ICT innovations that mediate corruption practices in developed countries (Krishnan, et al., 2013), to the contrary, promotes corruption in Nigeria (Ogutu, Okello, & Otieno, 2014). This is due to the fact that ICT adoption and sustainability in Nigeria has been plagued with corrupt polices, ethics and values. It is evident from this study that investment in ICT can have both negative and positive effect on the corruption level of a nation, depending on the value placed on ICT (Ogutu, et al., 2014; Wickberg, 2013). Increase in ICT investment possibly will provide infrastructures that can effectively monitor and control corruption. However, more ICT investments without adequate adoption, acceptance and sustainability can also provide an opportunity for corruption because, according to Sahi and Gupta (2013), the value placed on any technological innovation is measured by its adoption, acceptance and sustainability. Acceptance of a technology is measured by adoption, *adoption guarantees sustenance, while sustenance determines its value*. Consumers are likely to adopt, accept and sustain ICT services and be more satisfied with it if they believe that using the system will increase their performance and productivity (Sahi & Gupta, 2013). It is hypocritical to observe that the various arms of the Nigerian Government make much noise about ICT while in truth they do not value it because they do not see ICT services as a means to increase the performance and productivity of the nation. Rather ICT is seen more as a corruption-exposer technology. The objective of this study is to pinpoint strategies to increase transparency and fight corruption in Nigeria through effective ICT adoption, acceptance, and sustainability.

Besides adoption and sustainability challenges, achieving secure ICT systems is complex in nature, and demands a well-designed and well-developed structure that enables reliable physical and logical connection between different systems such as appropriate data governance and e-governance. ICT system involves both software, hardware, and other concepts such as data protocols that control the interactions between systems. ICT investments alone cannot solve its security problems until users understand technology and the problems (Stallings & Brown, 2012). This is because users appear to be the most significant links to the information security of any organization, and invariably constitutes the highest risk to the information security measures and information integrity of any organization (Stallings & Brown, 2012). The user is frequently the weakest link in the security of a system. Many security breaches are instigated by weak passwords, unencrypted files left on unprotected systems. This is why security breaches have been on the increase, involving both small and large organizations, notwithstanding the advancement in technology (Fenz, Heurix, Neubauer, & Pechstein, 2014).

Aside identifying how effective ICT adoption and usage can curb corruption and insecurity problems in Nigeria, determining what contributes to information insecurity and secure ICT system is also of paramount importance in this study, particularly in the implementation of

activities that mitigate threats, curb corruption to the organizations' data: confidentiality, integrity, and availability (Fenz, et al., 2014). Secure ICT system must be within the conceptual frameworks that leverage confidentiality, integrity, and authentication (Stallings & Brown, 2012). A conceptual framework for secure ICT system is considered for computer security that included among others: availability, access control, and privacy. Fenz, et al. (2014) viewed these from its five distinct functional areas: prevention, deterrence, risk avoidance, detection, and recovery; and defined in terms of several interdependent domains: physical and personnel security, system security, operational or procedural security, and network.

In this paper, the authors established some strategies for implementing a secured ICT innovations system that may impact data trustworthiness, accountability and compliance especially with users (Bertino, et al., 2014). They are focused on the availability, integrity and confidentiality of organization's ICT. However, it is vital that it works in harmony with other related policies and programs, including cyber safety, identity security and privacy. This study seeks to implement secure ICT system that will present a functional ICT system operation that is clear, safe, concise, familiar, responsive, consistent, attractive, enjoyable, efficient, and forgiving, and reliable to handle every ICT service delivery to customers. Secure ICT system will attract more customer to use ICTs which in turn, will cause organizations to enjoy additional revenue, high levels of customer satisfaction, investment opportunities, cost savings, effective service delivery, and competitiveness (Jegade, 2014). It is anticipated that findings from this study may motivate social change as more Nigerians will have value for ICT innovations, and secure ICT systems that are likely to leverage users' confidence, improve user morale, preference, attraction, and productivity, and also mediate corruption across all boarders of the economy.

Problem Statement

Corruption breaches among ICT Innovations in Nigeria have been on the increase in spite of the advancement in technology. The Corruption Perceptions Index (CPI) fluctuated substantially and tended to increase through 2005 - 2019 period ending at 26 score in 2019 (TI, 2020). This index for Nigeria averaged 20.98 points from 1996 until 2019, reaching an all-time high of 26 Points in 2019 (TI, 2020). Ironically, ICTs that are supposed to help mediate the effect of corruption in Nigeria, are plagued by corrupt policies and values. ICT Innovations functions should include policies, resources, activities, operations and implementation procedures defined to mediate corruption and mitigate most security threats, vulnerabilities, and risks. The general IT problem is the implementation of procedures: data governance, e-governance, policies, resources, activities, and operations to mediate corruption and mitigate security threats, and vulnerabilities. The specific IT problem is that some IT managers of ICT Innovations lack strategies to mediate corruption and mitigate security threats, and vulnerabilities, associated with ICT Innovations systems in Nigeria.

Conceptual Framework

The information system theory called the Technology Acceptance Model (TAM) was adopted as the foundation for this study. TAM was developed by Davis in 1989, based upon the psychology-based Theory of Reasoned Action (TRA) and Theory of Planned Behavior (TPB) (Davis, 1989). According to TAM, users accept and use technology by presuming two variables: Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). PEOU and PU are

the primary determinants TAM interwoven in a complex but mediating relationship between system characteristics (external variables) and potential system usage. A lot of researchers claims are consistent with TAM's views on how PU and PEOU are often determined by a perceived attitude towards technology (Gangwar, Date, & Raoot, 2014); cognitive ability (Chen, Liu, Li, & Yen, 2013); social, cultural, and political influences (Kaushik & Rahman, 2015); self-efficacy (Teoh, Siong, Lin, & Jiat, 2013); facilitating conditions (Tsai, 2015); usability measurement attributes (Hsiao & Tang, 2015); and effectiveness, efficiency, learnability, and memorability (Chen & Chan, 2013). This property of TAM makes it to be the preferred user-acceptance model for this study which focuses on trust, value, adoption, and usability of ICTs especially among people with varying attitudes, abilities and literacy levels.

Literature Review

Transparency International (TI) elucidated corruption as the abuse of entrusted power for personal or group interest (TI, 2020). Corruption can manifests in various forms: bribery, extortion, collusion, fraud, embezzlement, misappropriation, trading influence, illicit enrichment, abuse of position, and money laundering. A report by TI asserted that more than two-thirds countries in the world have corruption score below 50 on a 0-100 scale where 0 represents highest corruption (TI, 2020). In 2019, Corruption Perceptions Index (CPI) for Nigeria was 26 score (TI, 2020). This report suggests a high rate of corruption in Nigeria. That notwithstanding, prior research suggests that measures that can create atmosphere of transparency and openness are likely to help identify and deter corruption or corrupt behaviours (Krishnan, et al., 2013; Ogutu, et al., 2014; Wickberg, 2013). These measures include, but not limited to, effective e-governance (Krishnan, et al., 2013), good data governance (Khatri & Brown, 2010), well-functioning ICT policies, ethics and values (Komatsu, Takagi, & Takemura, 2013), literacy, with trust and value for technology (Adjei, 2015; Sahi & Gupta, 2013).

E-government is clarified as the application of ICTs and the Internet to promote access and delivery of all aspects of government services and operations that impacts transparency and accountability for the benefit of the citizens, businesses, employees and other stakeholders (Krishnan, et al., 2013). It is an effective and efficient process that runs on a sustainable ICT platform to improve transparency and accountability of all aspects of government services and operations for sustainable economic goals (Ionescu, 2013), and help to diminish corruption by enhancing transparency and accountability of government administration (Güney, 2017). Sustainable ICTs are enablers and platforms for sustainable e-government. Krishnan, *et al.* (2013) enumerated significant negative relationships exist between sustainable e-government and corruption. While ICTs are seen as enablers of e-governance, sustainable e-governance can impact reduction in corruption, problems of insecurity, and increased transparency in government. Guarded by the conceptual framework for this study, the authors addressed these gaps in the literature by adopting a theoretical approach that synthesise the link between ICT, e-governance, corruption, and problems of insecurity. These relationships among ICT, e-governance, and corruption can be represented as a continuing sequence of stages, tasks, or events in a circular flow, each shape having the same level of importance with no emphasis on direction of impact, shown in figure 1 below.

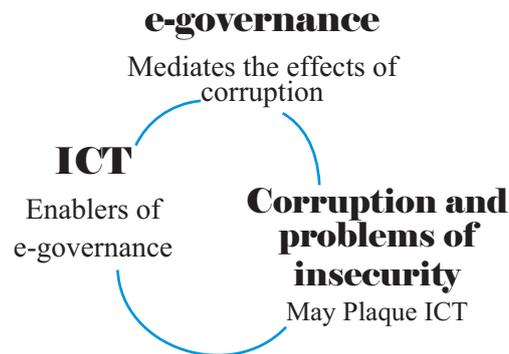


Figure 1 Relationship between ICTs, e-government, and corruption

e-government has the potential to offer: enhanced data governance service delivery (Khatri & Brown, 2010), increased usage and adoption of ICT and information systems security measures (Aguboshim & Udobi, 2019; de Albuquerque & dos Santos, 2015), reduction in corruption and increased transparency and accountability (Krishnan, et al., 2013), reduction of security breaches among ICT networks (Fenz, et al., 2014), and reduced gender ICT divide (ITU, 2016; Nwokocha, 2016; Park & Kim, 2014). In this study, our focus is on strategies to enforce sustainable ICT void of corruption and insecurities.

Barriers to the Implementation of Sustainable ICT in Nigeria.

Despite the global technological advancements, ICT implementation and adoption in Nigeria has remained quite slow, and in some situations non-effective due to: corrupt practices, poor adoption of ICT standards, ignorance, illiteracy, and bad governance.

First, ICT Infrastructures in Nigeria are either inadequate or incompletely implemented with poor internet accessibility. Basically, there is a lack of solid implementations of ICT innovations. Most of the technological innovations in Nigeria often end with the technological equipment alone leaving off “information and communication” aspect of ICT. This is because adequate data governance to drive ICT innovations are virtually nonexistence. Data governance is all about realising data as the asset to the nation's business, and making sure that all the rules, policies, roles, responsibilities and tools needed are put in place to ensure that data are accurate, consistent, complete, available and secure (Koltay, 2016). Data governance is defined as a system of prescribed acceptable models which described what actions are taken with the data and information, how, when, where, and under what conditions and methods, decision rights and accountabilities such actions are taken within an information-related processes. (Data Governance Institute, 2015). The global aim of data governance is to encourage a single version of the truth and to allow one single reference for critical master data, across geographies and business units. This is farfetched in Nigeria. Sustainable data governance is of significant importance in realizing or attaining sustainable e-governance that can mediate the effect of corruption and impacts increased transparency of decision-making in Nigeria. A significant relationship exists between sustainable ICT and sustainable data governance (Bennett, 2017). Lack of sustainable data governance in Nigeria is the reason why ICT Innovations are not effectively functional because ICT innovations frequently adopt databank rather than database system technology. For instance, Traffic lights in Nigeria are not properly implemented and so are not adequately or properly put to use. As a result police and other touts are used to check traffic light offenders, when the same traffic

light is embedded with a monitoring camera. What a stupendous waste of both human and technological resources. ICT innovation to curb corruption should be automated. One cannot run ICTs without good data governance and good communication of same. How can a nation run an automated traffic system without proper documentation of vehicles and owners? The same is applicable to other establishments such as Nigeria Road Safety Commission (NRSC), Police, and Ministry of Justice etc. For instance the NRSC or the police cannot at any location (outside their offices) ascertain the originality or expiry date of drivers licence. This is because our ICT infrastructures, where they exist, are not fully implemented or adopted. These situations breed corruption, and result in poor adoption and sustainability of the Nation's ICT. *It takes adoption or use of technology to sustain it* (Ogutu, et al., 2014).

Second, there is high rate of Ignorance, Illiteracy, and Lack of Trust on ICT Innovations in Nigeria. Sustainable ICT innovations in Nigeria have been hindered by the ignorance, illiteracy and lack of trust on IT innovations in Nigeria (Adjei, 2015; Sahi & Gupta, 2013). There is a high level of digital divide among the genders nationwide. The existing technological innovations in Nigeria have failed to provide easy-to-use system for the great number of Nigerians that are illiterates or semiliterate, and the many literate ones with illiterate-ICT mindsets. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) 2015 Statistic Report placed the Nigeria literacy rate for adults aged 15 years and older at 59.67% (UNESCO, 2015). Meaning that 40.33% are illiterates. Survey report by Enhancing Financial Innovation and Access (EFInA) revealed that only 7.9% of Nigerians use ATMs, while 53% of adults bank customers use their ATM cards. EFInA (2014) specified that Nigerians are likely to be among the top population that stores money in their houses, rather than aligning to the ongoing cashless move. Claims by researchers put the estimated percentage of cash in circulation in the Nigerian economy is outside of the banking system at 65% (Emengini & Alio, 2014; Ezeamama, Ndubuisi, Marire, & Mgbodile, 2014; Itah & Ene, 2014). One of the major reasons for this might be ignorance, illiteracy, and lack of trust of technology embedded in corruption instincts. Human resources in Nigeria generally lack competent personnel adequate awareness, and professional training required to implement increased transparency in the public sectors, as well as improved service delivery through user-friendly administrative systems.

Third, is the high level of corrupt policies and practices that plagued ICT innovations in Nigeria. ICT innovations in Nigeria have been subjected or corrupted with human emotions, thoughts, and attitudes, thereby rendering ICTs useless, un-impactful, and with nonsensical outputs. It is common in Nigeria to observe some of the so-called honorable men in the society breaking the traffic light, using the exit door for an entrance, their vehicles with government registration numbers even when they have left the office. Many drive their private vehicles without seeing any need to renew their vehicle particulars because the so-called ICT in place has been subjected to have attitude. This is a big slap on the face of technology in Nigeria.

Methodology

We adopted a narrative review methodology to review, analyse and synthesise prior research findings because drawing a holistic interpretations or conclusions from our reviews is of paramount importance. According to Hill and Burrows (2017), narrative review methodology is appropriate where analysis and synthesis of different and related research findings are required to draw holistic interpretations or conclusions based on the reviewers' own experience, existing theories and models. A narrative study approach is best suited for a

descriptive or explanatory study (Bell, 2017), where results from such narrative studies are of qualitative rather than quantitative in nature (Scarnato, 2017). There is significant strengths portrayed by narrative studies in the sense that they have ability to provide platforms for comprehension, diverse and numerous understanding around scholarly research findings, and the opportunity to make reflective practice and acknowledgement of researchers' views and knowledge (Scarnato, 2017).

Data Collection

We reviewed some professional and academic research findings that are relevant and related to our study. Many of such findings came from the proQuest databases, Science Direct, Walden University international library databases and peer-reviewed, and other related texts. Our reviews incorporated 38 references. Ninety two (92%) of total references incorporated in the study are peer-reviewed, while (71%) are peer-reviewed journals that are within the last 5 years.

Conclusion and Recommendations

Eradication of corruption using ICT will be dependent on several factors: automation of operations without attitudinal influence, removal of all forms of discretion (transparency), detection and monitoring of all ICT operations including online and networks, publishing corrupt culprits (deterrence), removal of respect for persons, and promoting ICT ethical standards and attitudes. Achieving all these may be difficult, but may provide real potentials for sustainable e-governance and other devices for reducing corruption, problems of insecurity, and increased transparency. Based on our findings, we recommend that countries with high level of illiteracy as Nigeria should consider usability interfaces to accommodate users' behavioural intention to use ICTs and their varied abilities, cultural backgrounds, and literacy levels. ICTs policies and standards should be well managed because technology alone is not sufficient to ensure information security. Humans appear to be the most significant links to the information security of any system and invariably constitute the highest risk to the information security measures and information integrity of any organization as what contributes to information insecurity has proven to be complex, dynamic and more of psychological in nature. It is believed that no single tool can exploit the full ICT control automation potential. A combination of different tools: data governance, e-governance, information security policies intentions, principles, rules and guidelines and sustainable ICT are required. We recommend that countries with high level of corruption consider implementing good data governance and e-governance to leverage sustainable ICT as a means to mediate corruption, mitigate system insecurities, and empower operations that impact transparency and accountability. It is hoped that findings from this study will encourage future studies to further explore the ICT-corruption link, including the relationships among ICT, data governance, e-governance, corruption, and the factors that moderate their relationship

References

- Adjei, J. K. (2015). Explaining the role of trust in cloud computing services. *Journal of Policy, Regulation and Strategy for Telecommunications, Information and Media*, 17(1), 67-54. <https://doi:10.1108/info-09-2014-0042>
- Aguboshim, F. C., & Udobi, J. I. (2019). Security issues with mobile IT: A Narrative Review of `` (JIEA), 9(1), 56-66. <https://doi:10.7176/jiea/8-1-070>

- Bell, E. E. (2017). A Narrative Inquiry: A Black Male Looking to Teach. *The Qualitative Report*, 22(4), 1137-1150.
- Bennett, S. (2017). What is information governance and how does it differ from data governance? *Governance Directions*, 69(8), 462-467.
- Bertino, E., Ghinita, G., Kantarcioglu, M., Nguyen, D., Park, J., Sandhu, R., ... Xu, S. (2014). A roadmap for privacy-enhanced secure data provenance. *Journal of Intelligent Information Systems*, 43(3), 481-501. <https://doi:10.1007/s10844-014-0322-7>
- Chen, K., & Chan, A. H. (2013). Use or non-use of gerontechnology-A qualitative study. *International Journal of Environmental Research and Public Health*, 10(10), 4645-66. <https://doi:10.3390/ijerph10104645>
- Chen, S., Liu, S., Li, S., & Yen, D. C. (2013). Understanding the mediating effects of relationship quality on technology acceptance: An empirical study of e-appointment system. *Journal of Medical Systems*, 37(6), 1-13. <https://doi:10.1007/s10916-013-9981-0>
- Data Governance Institute (2015). Definitions of Data Governance. Retrieved April 9, 2019 from : http://www.datagovernance.com/adg_data_governance_definition/.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance. *MIS Quarterly*, 13(3), 319-340. <https://doi:10.2307/249008>
- de Albuquerque, A. j., & dos Santos, E. (2015). Adoption of information security measures in public research institutes/adoç'o de medidas de segurança da informaç'o em institutos de pesquisa p'ublicos. *Journal of Information Systems and Technology Management : JISTEM*, 12(2) 289-315. <https://doi:10.4301/S1807-17752015000200006>
- EFInA (2014). EFInA access to financial services in Nigeria 2014 survey. Retrieved from <http://www.efina.org.ng/assets/ResearchDocuments/2014-Documenst/EFInA-Access-to-Financial-Services-in-Nigeria-2014-Survey-Key-Findings.pdf>
- Emengini, S. E., & Alio, F. C. (2014). Cashless economy and financial statement reporting in Nigeria. *European Center for Research Training and Development*, 2(3), 1-9.
- Ezeamama, M. C., Ndubuisi, N. J., Marire, M. I., & Mgbodile, C. C. (2014). The Impact of Central Bank of Nigeria Cashless Policy in Nigeria Economy. *IOSR Journal of Business and Management (IOSR-JBM)*, 16(12), 84-95. <https://doi:10.9790/487x-161218495>
- Fenz, S., Heurix, J., Neubauer, T., & Pechstein, F. (2014). Current challenges in information security risk management. *Information Management & Computer Security*, 22(5), 430-410. <https://doi:10.1108/IMCS-07-2013-0053>
- Gangwar, H., Date, H., & Raoot, A. D. (2014). Review on IT adoption: insights from recent technologies. *Journal of Enterprise Information Management*, 27(4), 502-488. <https://doi:10.1108/jeim-08-2012-0047>
- Güney, T. (2017). Governance and Sustainable Development: How Effective Is Governance? *The Journal of International Trade & Economic Development*, 26(3), 316-335.
- Hill, C., & Burrows, G. (2017). New voices: The usefulness of a narrative approach to social work research. *Qualitative Social Work: Research and Practice*, 16(2), 273-288. <https://doi:10.1177/1473325017689966>
- Hsiao, C., & Tang, K. (2015). Investigating factors affecting the acceptance of self-service technology in libraries: The moderating effect of gender. *Library Hi Tech*, 33(1), 133-114. <https://doi:10.1108/lht-09-2014-0087>
- Ionescu, L. (2013). The Impact That E-Government Can Have On Reducing Corruption And Enhancing Transparency. *Economics, Management, and Financial Markets*, 2(1), 210-215.
- Itah, A. J., & Ene, E. E. (2014). Impact of Cashless Banking on Banks? Profitability. *Asian Journal of Finance & Accounting*, 6, 362-376. <https://doi:10.5296/ajfa.v6i2.6268>
- ITU (2016) "How can we close the digital gender gag?" Retrieved September 10, 2019 from https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.itu.int/en/itu/news/Documents/2016-04/2016_ITUNews04-en.pdf&ved=2ahUKEwiAgOP3s8nkAhWDiVwKHVrICBgQFjAAegQIBRAB&usg=AOvVaw0VRKQiXQd8A9n1kNG3RPMS
- Jegede, C. A. (2014). Effects of Automated Teller Machine on the Performance of Nigerian Banks. *American Journal of Applied Mathematics and Statistics*, 2(1), 40-46. <https://doi:10.12691/ajams-2-1-7>
- Kanu, I. A. (2017). *The culture of political corruption and the emergence of terrorism in Nigeria*. In

- Mahmoud Misaeli and Rico Sneller (Eds.). *The Root Causes of Terrorism: A Religious Studies Perspective* (pp. 280-291). United Kingdom: Cambridge Scholars Publishing.
- Kanu, I. A. (2016). Corruption in Nigeria as a Socio-Cultural Context for the Extraordinary Jubilee of Mercy. *Harvard Journal of Management Sciences and Entrepreneurship*, Vol. 3. No. 5. pp. 187-196.
- Kanu, I. A. (2011). Corruption in Africa and its Challenges for the Enterprise of Christian Theology. *International Journal of Research in Arts and Social Sciences*, Vol.4. pp. 492-500.
- Kaushik, A. K., & Rahman, Z. (2015). Innovation adoption across self-service banking technologies in India. *The International Journal of Bank Marketing*, 33(2), 121-96. <https://doi:10.1108/ijbm-01-2014-0006>
- Khatri, V., & Brown, C. V. (2010). Designing data governance. *Communications of the ACM*, 53(1), 148-152. <https://doi:10.1145/1629175.1629210>
- Koltay, T. (2016). Data governance, data literacy and the management of data quality. *International Federation of Library Associations and Institutions*, 42(4), 303-312.
- Komatsu, A., Takagi, D., & Takemura, T. (2013). Human aspects of information security. *Information Management & Computer Security*, 21(1), 5-15. <https://doi:10.1108/09685221311314383>
- Krishnan, S., Teo, T. S. H., & Lim, V. K. G. (2013). Examining the relationships among e- government maturity, corruption, economic prosperity and environmental degradation: a cross-country analysis. *Information & Management*, 50(8), 638-649.
- Nwokocha, E. T. (2016). Bridging the Barriers: ICT in the Girl-Child Education in Nigeria. *Developing Country Studies*, 6(10), 44-51. <https://doi:10.15640/jsspi.v6n1a2>
- Ogutu, S. O., Okello, L. J., & Otieno, D. J. (2014). Impact of Information and Communication Technology-Based Market Information Services on Smallholder Farm Input Use and Productivity: The Case of Kenya. *World Development*, 64(1), 311-321.
- Park, E., & Kim, K. J. (2014). Driver acceptance of car navigation systems: integration of locational accuracy, processing speed, and service and display quality with technology acceptance model. *Personal and Ubiquitous Computing*, 18(3), 503-513. <https://doi:10.1007/s00779-013-0670-2>
- Sahi, G. K., & Gupta, S. (2013). Predicting customers' behavioral intentions toward ATM services. *Journal of Indian Business Research*, 5(4), 251-270. doi:10.1108/jibr-10-2012-0085
- Scarnato, J. M. (2017). The value of digital video data for qualitative social work research: A narrative review. *Qualitative Social Work: Research and Practice*, <https://doi:10.1177/1473325017735885>
- Stallings, W., & Brown, L. (2012). *Computer security: Principles and practice* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.
- Teoh, W. M., Siong, C. C., Lin, B., & Jiat, W. C. (2013). Factors affecting consumers' perception of electronic payment: an empirical analysis. *Internet Research*, 23(4), 465-485. <https://doi:10.1108/IntR-09-2012-0199>
- TI (2020). *What we do -Corruption Perceptions Index* . http://www.transparency.org/policy_research/surveys_indices/cpi/
- Tsai, Y. (2015). Applying the Technology Acceptance Model (TAM) to explore the effects of a Course Management System (CMS)-Assisted EFL writing instruction. *CALICO Journal*, 32(1), 153-171. <https://doi:10.1558/calico.v32i1.25961>
- UNESCO (2015). Data center. Retrieved from <http://www.uis.unesco.org/DataCentre/Pages/country-profile.aspx?regioncode=40540&code=NGA>
- Wickberg, S. (2013). Technological innovations to identify and reduce corruption. U4 Anti-Corruption Resource Centre. Retrieved from <https://www.u4.no/publications/technological-innovations-to-identify-and-reduce-corruption.pdf>