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ADVANCEMENT OF INFORMATION TECHNOLOGY AND ORGANIZATIONAL PERFORMANCE IN NIGERIAN TERTIARY INSTITUTIONS*

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Abstract

The study focused on advancement of Information Technology and Organizational Performance in Nigerian Tertiary Institutions. Pressure, time wasting, distraction and stress emanating from technological advancement can influence organizational performance which in turn might lead to loss of productivity in an organization. The study adopted co-relational survey design and questionnaire as instrument for data collection. The total population of the study comprised of 3,125 senior non-teaching staff of Federal University of Technology, Owerri, Imo State, Nigeria. The sample size was determined using Taro Yamane formula and calculated as 264. Simple random sampling technique was adopted in the distribution of the survey. Out of 264 questionnaires administered only 211 were filled and returned while the remaining 53 were not utilized for the study. The test result of the research question established that there exists a significant positive relationship between electronic mail and service quality. The researchers recommend management of tertiary institutions to support upskilling of employees through development program on the use of ICT tools.

Keywords: *Information Technology, Electronic Mail, Service Quality, Internet, Organizational Performance*

1. INTRODUCTION

The education sector is currently being transformed by digital technology in Nigerian tertiary institutions in order to add value to the system. Other industries in Nigeria have followed suit in embracing innovative technology, outside educational institutions. Employees are expected to become proficient in technology as businesses change the operational strategies that govern how they conduct business. Organizational structure is made up of people, and how well they can connect, communicate, and innovate determines how successful the business will be.

The strategy that firms adopt can make either positive or negative impact on their operational performance. The rates at which technological break-through are emerging have created opportunities for growth and competition for organization to enhance its performance (Harvard Business Review, 2018). Information Technology was used by managers to make wise decisions on improving business processes to achieve

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organizational objectives. Advancement in Information and Communication Technology (ICT) has placed value system in electronic administration, decision-making process, cost of running administration, time reducing etc. in tertiary institutions.

According to the views of Abdullahi (2019) Information technology plays significant role in the efficient management of tertiary education, enhancement of the administration process, reduction of the cost of governance, achievement of flexibility in learning of tertiary education. Information Technology helps in administrative services and management of both students and staff records and inventory management in Nigerian universities.

Regrettably, to say that distraction is one of the negative impacts of innovative technology at the workplace. The emerging technology has created much pressure on employees due to much time workers spend on using digital platforms, all of which led to cyber loafing, time wasting and lost productivity. Average worker in tertiary institution spends more time on personal chatting via digital platforms instead of performing legitimate functions in the office. Therefore, pressure, time wasting, distraction and stress emanating from technological advancement had negative influence on quality of service which can result to loss of productivity in a particular unit or department. Those employees who cannot adapt to digital trend may find it difficult in meeting with desired outcomes and expectations in some units/departments. The negative effect of the emerging technology has underlying problems and may cause loss of privacy, cyber-bullying and difficulty focusing on important task. Inability to curtail excessive use of this digital trend can influence organizational productivity. It is against this backdrop of information that study objective is formulated below.

Previous studies of Helpman and Trajtenburg (1998) revealed that technology adoption contribute positively to firm productivity. Another study by Gallego, Gutierrez and Lee (2011) found that technology adoption increase the size of the organization which in turn will lead to firm growth. In light of the above, previous study did not ascertain the influence of electronic mail (digital technology) and service quality in tertiary institutions in Owerri, Imo State, Nigeria. It is in this gap that study is formulated to achieve study objectives.

2. REVIEW OF RELATED LITERTAURE

2.1. The Concept of Information Technology

Rouse (2014) defined Information Technology in terms of devices, networking components, applications and systems that allow people and organizations to interact in the digital world. The author posit that information technology encompasses all components related to computer and digital technology. It is made up of the internet access, mobile devices (smart phones), cloud computing, communication technologies (such as, landline telephones, radio and television broadcast), hardware, software and data which allow people and organizations to share information in the digital globe. Olasanmi, Ayoola and Kareem (2012) define Information Technology as a computer systems, telecommunication, networks and multi-media application that augment knowledge for carrying out a given task which implies skills and processes essential for conducting business operations in a specific way. The authors concur that technology not only increases productivity and operational efficiency of both employees and organization but also saves cost for the organization.

2.1.1. The Concept of Electronic Mail

It is defined as a computer-based application for the exchange of messages between users (Harrison, 2003; Sampson, 2003). A worldwide email network allows people to exchange e-mail messages very quickly. Root and Thompson (2019) have identified merits and demerit of using electronic mail in doing businesses. One of the advantages of email communication is that it works for twenty-four (24) hours a day, which allow users to send multiple messages at their convenience to a client or business associate who is located thousands of miles away. One of the disadvantages of electronic mail is its ease of exposure to loss. It does not take time for someone to access private information of another person. Again, important information on hard drive can be crash or hacked within seconds. It is difficult to interpret emotions using email unlike face-face contacts which offers individuals opportunity to express emotions and feelings.

2.1.1.1. The Concept of Performance

Business Dictionary (BD, N.D) defined performance as the accomplishment of a given task measured as present known standard of accuracy, completeness, cost and speed. Performance evaluates whether an individual perform his/her job well (Campbell, McCloy, Oppler & Sager, 1993). It clarifies the overall estimated value to the organization of the discrete behavioral occurrences that an individual carries out over a standard period of time. Job performance is an important criterion for organizational outcomes and success. Berkeley (2019) further explain that the objective of performance is to improve strategy execution by aligning business activities and individual actions to achieve firms' strategic and operational objectives. According to the authors perspective, performance helps in the periodic rating, monitoring, reward and compensation, planning and expectation setting to achieve organization goals. Organizations need to have top performing individuals to improve quality of products to be able to meet market demands and to achieve competitive advantage.

Kaplan (2012) identified key performance indicators (KPI) as financial and non-financial indicators. Financial indicators are those that contribute to financial success. Examples of financial indicators are; asset turnover, liquidity, profit or loss of the year, solvency, leverage, equity, growth in revenue, net profit margin, gross profit margin, operational cash flow, current accounts receivables and inventory turnover. Financial Performance Indicators are generally based on income statement or balance sheet components, and may also report changes in sales growth (by product families, channel, customer segments) or in expense categories. Typical non-financial indicators include measures that relate to customer relationships, employees, operations, quality, cycle-time, and the organization's supply chain or its pipeline.

2.1.1.1.1. The Concept of Service Quality

Service Quality describes how service delivered conforms to the customers' expectations (American Marketing Association, 2012). It is considered the difference between service expectations and service perceptions. Service expectations are the desired expectations that customers want the service to meet in practice. It reflects both past and present service evaluation and user experiences. Service quality or quality of service also refers to excellence provided to the end customer in the service offering provided. Service business

operators often assess the service quality provided to their customers in order to improve their service, to quickly identify problems, and to better assess client satisfaction.
Janakiraman and Gopal (2006) have identified five dimension or component of service quality. They are listed as; reliability, responsiveness, timeliness, completeness and assurance. Reliability refers to consistency of performance. It is the ability to perform the service dependently, accurately and consistently. Responsiveness refers to ability to meet with the expectation of customers. This implies providing timely service to clients. Timeliness is the ability to render prompt services to customers. It is when a service is rendered to customers as when promise or without delay. Assurance refers to the knowledge and courtesy of employees and their ability to express trust and confidence. Completeness describes a situation when all items in the order are included (Janakiraman & Gopal, 2006; Arora, 2006).

2.2. Theoretical Framework

This study is anchored on Resource-Based View postulated by Barney in 1991. Resource Based View (RBV) theory explains why organization succeeds or fail in the market place. It states that resources that firms possess influence its performance. According to this theory, organizations achieve its competitiveness using human resource and capabilities that domicile inside the organization. This theory is linked to information technology and organizational performance because firm's competitiveness depends on staff (human resources) which can be a source of its competitiveness (competitive advantage) if they are; valuable (v), rare (r), inimitable (i) and non-substitutable (n) compared to its rivalry (Pankaj, 2010).
The theory was criticized based due its methodological nature, RBV theory was criticized on the ground that it is a political theory because it is applicable to leading firms with resources of high order to shape their strategy to achieve sustainable advantage (Kirsten, 2017). On the issue of terminology, RBV failed to consider factors surrounding resources, that is, an assumption that they simply exist, rather than a critical investigation of how capabilities are acquired or developed. Finally, it is impossible to find resources that satisfied all of Barney's VRIN criteria (Stinchcombe, N.D).

2.3. Empirical Review

Onobrakpeya, Nana and Odu (2018) examined the Effect of Information Communication Technology on Service Delivery in the Nigerian Manufacturing Industry. The total population of the study comprised of 515 employees of six selected private listed manufacturing firms (AG Leventis, Lever Brothers, PZ industries, UAC Nigeria, UTC Nigeria, 7UP Bottling Company PLC) in Nigeria. Cross Sectional Survey Research Design was adopted and questionnaire was used as instrument of data collection. Correlation and multiple regressions was used to test the hypothesis to generate data. Findings showed that electronic mail, teleconferencing and telecommuting variables of information and communication technology had positive effect on service delivery.
Obra, Camara and Melendez (2002) investigated Internet Usage and Competitive Advantage in Spanish Firms. Study adopted descriptive survey approach and survey as instrument for data collection. Correlation method was used to analyse the relationship between the variables. Study found that, there exists significant relationship between internet technology and competitiveness advantage (market share) of firms.

Hammami and Zghal (2016) conducted a study on Internet and Competitiveness of Small and Medium Enterprise in Tunisia. The study population comprised of 206 Tunisian manufacturing small and medium enterprises (SMES). Structural Equation Modeling (SEM) technique was used to analyze the result. Findings showed that internet has positive influence on competitiveness of firms.

Ashish (2008) investigated the Influence of Information Sharing Practices, Supplier Network Responsiveness on Time to Market Capability of a Firm in USA. The web-based survey yielded 294 responses from industry professionals in the manufacturing and supply chain area. The hypotheses were tested and analyzed using Structural Equation Modelling (SEM). Findings point out that higher levels of information sharing practices can lead to improved supplier network responsiveness and reduced time-to-market of a firm. Findings also showed that supplier network responsiveness can have a direct positive influence on time-to-market capability of a firm.

3. RESEARCH METHODOLOGY

Research designs are developed to meet the unique requirements of a study. A research design is the overall plan for obtaining answers to the questions being studied and for handling some of the difficulties encountered during the research process (Kassu, 2019). It is a blue print that shows the manner and method research will adopt to analyse data to fulfill objectives of research. It is valid when conclusion is accurate. Correlation survey design was adopted to test the influence of electronic mail on service delivery. Research design allow the researchers to make observation of what happens in the field without manipulating data.

The total population of the study comprised of 3,125 non-teaching staff of both Federal University of Technology and Imo State Polytechnic Umuagwo, Owerri, Imo State, Nigeria. The researchers focus only on senior administrative and executive staffs from grade level eleven and above. The reason for choosing them is due to their level of experience about university administrative system.

3.1. Sample Size and Sampling Technique

The sample size was statistically determined using Tarro Yamane formula (1967) for finite population. The formula is mathematically stated as:

$$n = N/1 + Ne^2 \tag{1}$$

where n = sample size; N = Population Size; e = Sampling Error = 0.05.

$$n = \frac{N}{1 + N \cdot (e)^2} = \frac{3125}{1 + 3125 \cdot (0.05)^2} = 264.08 \approx 264 \tag{2}$$

The sample size was determined statistically and calculated as 264. Simple Random sampling technique was adopted to select the participants in the survey. This method allows every item in the population a chance to be selected. This implies that every sample (institutions) has the probability of being selected and represented in the survey.

3.1.1. Method of Data Collection

Primary data was sourced with the aid of structured questionnaire administered using five points-likert scale. The response scoring weights were listed below; Strongly Agree (SA) rated as 5, Agree (AG) rated as 4, Undecided (UN) rated as 3, Disagree (DA) rated as 2 and Strongly Disagree (SD) rated as 1.

3.1.1.1. Method of Data Analysis

The data used in testing the hypotheses was obtained from research topic Advancement of Information Technology and organizational Performance in Selected Tertiary Institutions in Owerri, Imo State, Nigeria. Simple regression technique was used to test the hypothesis statistically.

3.1.1.1.1. Model Specification

Information Technology was proxy to electronic mail, while organizational performance was also proxy to service quality. The model specified below showed the the influence of electronic mail on service quality. The model equation is stated below.

$$Y= \beta_0 +\beta_1 X_1+\beta_2 X_2+ \beta_3 X_3 + e \quad (3)$$

Where; X is a function of, X_1, X_n representing independent variable (information technology), and B_1, B_2… B_n are the coefficients of the regression equation; Y= Service quality (Y_1); β_0 = parameter constant; e= Error term.

4. RESULT AND DISCUSSION OF FINDINGS

4.1. Presentation of Result

In this study, Federal University of Technology Owerri and Imo State Polytechnic Owerri, were chosen as two higher education institutions, with a view toward how information technology affects organizational performance. Primary information was gathered and presented according to the study question. Utilizing the IBM Statistical Package on Social Science (SPSS Version 20), data were gathered, tabulated, and analysed. Only 211 of the 264 copies of the questionnaire that were sent to the respondents were filled out and returned; the other 53 copies were kept and utilized in the analysis.

4.1.1. Analysis of Research Hypothesis

H_{A2}: Electronic Mail contributes significantly to service quality. Table 1 below shows participant response on research question one using five-point likert scales. Instruction: Please tick (✓) a response according to your own opinion using; strongly agree (SA=5), agree (AG=4), undecided (UN=3), disagree (DA=2) and strongly disagrees (SD=1).

Table 1: Investigative Questions on Information Technology and Organizational Performance

S/N	Test Questions	SA	AG	UN	DA	SD	Total
A	Information Technology						
	Electronic Mail						
1.	Every unit in my institution is optimized with digital platforms which affords us the opportunity to do our work faster.	148	53	9	1	0	211
2.	Our staff are trained on the use electronic administration.	163	40	4	3	1	211
3.	Electronic mail provides faster and easier access to information.	162	38	9	1	1	211
4.	Technology reduces job load and work stress in my unit.	153	47	3	6	2	211
5.	Electronic mail provides possibility of sharing common information in my workplace.	113	88	1	8	1	211
B.	Organizational Performance						
	Service Quality						
6.	Our services have improved as a result of digital platforms.	153	47	3	6	2	211
7.	My institution provides uninterrupted internet services to students and lecturers.	157	50	2	2	0	211
8.	My establishment aims at maintaining error free records in all units and departments.	168	32	5	4	2	211
9.	We have improved our communication system from paper work to the use of electronic mail.	142	61	4	2	2	211
10.	We have gained trust and confidence of our students using our electronic platforms in making payment and registering of courses.	153	51	4	1	2	211

Source: (SPSS Version 20)

4.2. Test of Research Hypothesis

H_{A1}: Information Technology contributes significantly to service quality.

4.2.1. Decision Rule

When p-value is ≤ 0.05 reject the null hypothesis (H_0); otherwise accept the alternate (H_A) hypothesis. When the p-value (.000) was less than the critical value (0.05), the alternate hypothesis which states that information technology contribute to service quality was accepted; while the null hypothesis which states that information technology do not contribute to service quality was therefore rejected. The result indicates that the relationship is statistically significant between the variables.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.998[a]	.999	.999	4.43872	1.156

Source: (SPSS Version 20)
a. Predictors: (Constant), EM
b. Dependent Variable: SQ

Table 3: Result of Analysis of Variance (ANOVA[a])

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	473950.336	1	473950.336	24055.610	.000[b]
	Residual	551.664	341	19.702		
	Total	474502.000	342			

Source: (SPSS Version 20). a. Dependent Variable: SQ; b. Predictors: (Constant), EM; SQ represent Service Quality; EM represent Electronic Mail

Table 4: Result of Simple Regression (Co-efficients[a])

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.349	1.096		-.319	.752
	EM	1.003	.006	.999	155.099	.000

Source: (SPSS Version 20); a. Dependent Variable: SQ

$$Y= \beta_0 +\beta_1 X_1+ \beta_n X_n + e \quad (4)$$

The regression analysis can thus be restated as follows:

$$SQ = -3.49 + 0.999 (EM) \quad (5)$$

4.3. Discussion of Findings

The linear regression approach was used to test the hypothesis, and the resulting model summary and analysis of variance are shown above. The findings of the hypothesis test were evaluated in light of the statistical significance of the regression coefficient. Tables 2, 3, and 4 illustrate the results, correspondingly. A correlation value (R) of .998 was obtained in Table 2, indicating a significant linear relationship between the variables electronic mail (EM) and service quality. Further research generated an adjusted R squared value of 0.999, indicating that the information technology variable (electronic mail) accounts for 99.9% of changes in service quality, with the remaining 0.1% being explained by other factors not included in the current regression model. The ANOVA test result in table 3 above were performed at 95 % confidence level to show the models goodness of fit. The result further showed that the model predicting the influence of information technology on service quality was significant ($F= 24055.610$, $p <0.05$). The result explain that information technology had a significant positive influence on service quality. The null hypothesis was rejected, while alternate hypothesis was accepted.

5. FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1. Summary of Findings

The summary of the finding was presented as follows. Findings of research hypothesis revealed that information technology variable (electronic mail) and organizational performance variable (service quality) are statistically at 5 % level of significant. Findings revealed that, there exists a significant positive relationship between electronic mail and

service quality. Simple Regression result showed the value of R Squared = .999, F cal. = 24056, Durbin Watson = 1.2 and P (value)= 0.000.

5.1.1. Conclusion

This study focused on the influence of information technology on organizational performance in selected tertiary institution: Federal University of Technology Owerri and Imo State Polytechnic Owerri. This result confirmed that electronic mail (digital technology) promotes service quality of tertiary institutions. This result is in agreement with findings of Onobrakpeya, Nana and Odu (2018) which showed that electronic mail, teleconferencing and telecommuting variables of information and communication technology had positive effect on service delivery.

5.1.1.1. Recommendations

Based on findings above, the following recommendations were made to guide this study.

I. Organizations are advised to communicate to employees their visions and mission to enable them achieve organizational goals.
II. The management of Tertiary institutions are advised to support their staff in skill acquisition program on the use of ICT tools.
III. There should be increased collaboration between staff and management in adopting electronic administration in order to achieve efficiency in the university administration.
IV. There should be provision for adequate ICT facilities in every unit and department to enable use of electronic administration quality in the university.
V. Universities should deploy computer technicians in every department/unit to handle technical issues associated with ICT.
VI. The study also recommends management to adopt automation system in all administrative process in the university to meet global best practices.

5.2. Future Research

This study is limited to two tertiary institutions in Owerri. Future researchers are advised to identify problems from another angle and explore it using other sectors in Nigeria. The study recommends future researchers to explore the influence of electronic governance on Nigerian economy.

RAZVOJ INFORMACIONIH TEHNOLOGIJA I ORGANIZACIONIH PERFORMANSI U NIGERIJSKIM TERCIJARNIM INSTITUCIJAMA

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Izvod

Studija je fokusirana na unapređenje informacionih tehnologija i organizacionih performansi u nigerijskim tercijarnim institucijama. Pritisak, gubljenje vremena, ometanje i stres koji proizilaze iz tehnološkog napretka mogu uticati na performanse organizacije, što zauzvrat može dovesti do gubitka produktivnosti u organizaciji. Studija je usvojila korelacioni dizajn istraživanja i upitnik kao instrument za prikupljanje podataka. Ukupnu populaciju studije činilo je 3.125 ispitanika višeg nenastavnog osoblja Federalnog tehnološkog univerziteta, Overri, država Imo, Nigerija. Veličina uzorka je određena korišćenjem Taro Iamane formule i izračunata je kao 264. U distribuciji ankete je usvojena jednostavna tehnika slučajnog uzorkovanja. Od 264 primenjena upitnika samo 211 je popunjeno i vraćeno, dok preostala 53 nisu korišćena za studiju. Rezultatom testa istraživačkog pitanja utvrđeno je da postoji značajna pozitivna veza između elektronske pošte i kvaliteta usluge. Istraživači preporučuju menadžmentu tercijarnih institucija da podrže usavršavanje zaposlenih kroz razvojni program o korišćenju IKT alata.

***Ključne reči**: informacione tehnologije, elektronska pošta, kvalitet usluge, internet, organizacione performanse*

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