



Digitalization and Employee Productivity in Nigeria

OSHODIN EFOSA ABIODUN, EVBAZIEGBERE ISIBOR
University of Benin, Benin City, Nigeria.

Abstract. Digitalization is an important tool for organization for effective performance and sustainability. The advent of covid-19 increased the need for digital innovations in organizations. This study is earmarked to find the impact of digitalization on employee productivity. With 200 copies of structured questionnaire, respondents constituted the sample size, and the resulting data was analysed descriptively using SPSS. The study found that with digitalization in organizations proxied by reduction in person to person interactions, job autonomy and work-life family balance has improved employees' productivity. Also, the study showed that telecommuting as a digital technology has helped increase employee productivity level. The study concludes that employee productivity is a means to improve customer expectations.

Keywords: Digitalization, Employee Productivity, in-person interaction, Work-family balance, Job autonomy, Telecommuting.

1. Introduction

Man by nature is a social being and must interact with his environment for the achievement of certain goals or plans. An organization too, depends on this social nature of man to also achieve its set goals and objectives for its survival and growth. According to the Global Outbreak Alert and Response Network (GOARN), the first case of Coronavirus disease was recorded on 31 December 2019, in Wuhan China. With its rapid spread around the world, it became difficult for man to effectively interact with his environment in person. With the outbreak of the coronavirus pandemic, the global business environment has suffered a reverse and decline in growth with the pandemic influencing all aspects of human and organizational existence. However, the

impacts on the global economic activity cannot be overemphasized as it cut across areas such as a reduction in consumers spending habit, increased unemployment rate, increased operating expenses of organizations. According to López-Arellano, Romero-Rubio, Sandoval-Félix, and Vega-Arellano (2023) the pandemic has significantly affected the work life and productivity of employees.

Since organizations cannot operate in a vacuum, especially ones created by the pandemic, critical measures in meeting the demand of the environment needed to be adopted. After the pandemic, digital technologies became very instrumental as they played the crucial role of facilitating the continuity of the regular day to day living as well as connecting people within and outside an organization more than at any other time in the history of digitalization.

The post covid era saw many organizations in the world, including Nigeria, implementing the use of digital technologies in attending to their job responsibilities. Kimondo (2020) conducted a study on the challenges of telecommuting in the effective management of staff in Kenya during the COVID-19 era, found out that by using digital technologies, made it possible for middle level managers to effectively communicate with employees and keep close tab on the progress of employees. However, in Nigeria, the use of digital technologies or telecommuting is still a practice that is unfamiliar among most workers and there is dearth of research in Nigeria on how digitalization in post covid affected employee productivity. Therefore, the broad aim of this study is to examine the impact digitalization has on employee's productivity in a post COVID era in Nigeria.

2. Conceptual Review

2.1 Concept of Digitalization

Gbadegeshin (2019) described digitalization as the process of organizational application or adoption of modern digital technologies to any activity carried out by man, such as personal, economic, social and political activities. Urbach and Ahlemann (2019) gave a broader definition, when they defined digitalization as the utilization of technological innovations in the business environment that has a positive impact on the business process, supply chain, sales of goods and services. In relation to organizational business processes, digitalization in any form may refer to the use of digital computing tools with the aid of the different web platforms that facilitate fast work processes.

In relating digitalization to the context of organizational workplace, De Bruyne and Gerritse (2018), opined that the digital working environment of an organization affects people in the aspect of how they engage and corporate with others within the organization including other stakeholders. As one of the biggest and ever-changing aspects of business in the world, digitalization continues to play a crucial role in reshaping and repositioning the way businesses carry out their respective activities globally (Schreckling and Steiger, 2017). This no doubt implies that by adopting the use of digital technologies in an organization or business process, the role of employees within the organization may change, thus reshaping or redefining the job responsibility of employees.

2.2 Digitalization and Reduction in Person Interaction

Digitalization in organizations has led to redesigning of business models and influence of work behaviour and performance (Barley, 2015; Verhoef et al., 2019). The virtual environments where organizations operate impact relationships and interactions between the employees on one hand and the employees and consumers on the other hand (Empson and Howard-Grenville, 2021). In the post covid era, there has been an increase in dynamics causing a global acceptance of digital technologies in organizations (Bellis, Trabucchi, Buzanza, and Verganti, 2022). This new practice has come to stay and as such values, purposes and norms will be reviewed overtime (Frisch and Greene, 2021). Thus, it is imperative that new skills, attitude and knowledge be adopted to effectively relate with one another (Mysirlaki and Paraskeva, 2020).

Within the context of organizations, digitalization of work activities will include the use of digital

technologies such as telecommuting which is a core tool in this study to facilitate relationships and interactions (Schwarzmueller, Brosi, Duman and Welp, 2018). Contrarily, Iannotta Meret, and Marchetti, (2020) and Frisch and Greene (2021) noted that digitalization impedes the spontaneity of interactions due to absence of chance events and unofficial gathering by directly impacting trust-building and communication.

2.3 Digitalization and Work-Family Balance

According to Munusamy (2016), work-family balance is defined as the organizational working policy that enables employees to effectively balance work and other family responsibilities. It is the situation where an employee can attend to both their personal and work responsibilities without any conflicting interests. Molina (2023) further opined that flexibility brought about by telecommuting is a contributing factor to effectively balance work and family life due to workers flexible working time and location. Um, Kou, Waldrep and Gerson (2024) further added that work-family balance is been achieved because telecommuting affords employee the ability to manage their time and engage in other activities, like recreational activities and spending time with loved ones.

2.4 Digitalization and Job Autonomy

Hema and Rajoo (2023) defined job autonomy as the degree of significant freedom, independence and discretion given to employees by employers to carry out their assigned task or work. Khoshnaw and Alavi (2020) further added that job autonomy can be classified into two specific areas of having autonomy over work approach and work timing or schedule. Yeung and Hao (2024) further suggest that in telecommuting, employees require and enjoy job autonomy since they are to perform their job responsibilities without the constant scrutiny of employers. Huu (2023) cited the significance of digital competence and job autonomy in encouraging workers ingenuity, learning, and sharing knowledge. Huu (2023) further acknowledged that employees with greater digital job autonomy are more committed to work improved work performance, thereby leading to improved employee productivity.

3. Telecommuting in Nigeria Organizations

According to Onyemaechi, Chinyere, and Emmanuel (2018), telecommuting, permits employees to be more adaptable and flexible as regards their job schedules, thereby helping them to quickly respond to emergency

needs within the organization. Telecommuting has been described as the process of utilizing technological means that makes it possible for employees to perform their job responsibilities remotely, without necessarily reporting to the workplace (Ye, 2012). Jaafar, and Rahim (2022) suggests that telecommuting can prove to be beneficial to employees in job autonomy, work-family balance and on the level of work stress.

3.1 Challenges of Telecommuting in Nigeria Organizations

Although telecommuting help employees as well as employers to remain relevant whether physically present on the job or not, they continue to perform their job responsibilities to meet organizational goals and objectives, there are still challenges that comes with this practice such as adaptability to telecommuting program of an organization, fear of trusting employees to deliver effective performance and the risk of information security (Omolawal, 2023). Sam (2019) identified some factors that contribute to digital inequality in Nigeria include lack of education, low income and poor electrical infrastructures. However, according to Daniels (2017) there is an ongoing collaborative effort between government and tech giants like Google, Microsoft, Intel and Chub to curve the inequalities or digital deficiency in Nigeria through the creation and support of e-learning facilities. According to Chitanana (2019), digital inequality can have adverse effects to Nigerians such as lack of compendious learning and youth stability.

To solve these problems brought about by the digital inequality or divide in Nigeria, Chitanana (2019) and Sam (2019) suggested the availability of e-learning digital technologies and ICT infrastructure; provision of computers to citizenry initiative (Daniels, 2017); updating existing facilities to improve the digital participation of the country (Odeh and Akinade, 2017).

4. Employee Productivity

Nasirzadeh and Nojedehi (2015), recently defined employee productivity in the construction industry, as the ratio between completed work done, and the total amount of time used in carrying out the assigned task. Similarly, Iqbal, Ahmed, and Allen (2019) defined employee productivity in terms of impersonal trust, which they argued that absence of trust between co-workers and employers can result in lower productivity of employees. Hasan (2016) opined that there is a direct relationship between employee productivity and organizational growth, since employees are agents through which organizational

goals and objectives are met. According to Stevenson (2009) some new factors that now affects employee productivity includes; technology choice of the organization, quality of services offered by the organization, the capital type employed by the organization, internet networking system of the organization, new workers, lack or shortage of ICT workers, virus affecting computer system within the organization and the breakdown of machines in the organization.

4.1 Maintaining Employee Productivity in a Post COVID Era

The surge of COVID-19 around the world has led to organizations adopting new ways to conduct their business. As observed by organizations, the pandemic has led to the increase in the workload of those employees remaining in certain organization, as well as also bringing about some changes in the employment agreement of other employees such as the introduction of part time workers and telecommuters (teleworkers). With the help of digitalization, some employees can carry out their job responsibilities from home. However, according to research carried out by ILO (2020), show that employees that work from home with the help of digital technologies tend to work longer hours including at nighttime. This finding is in unison with the study carried out by Anakpo, Nqwayibana, and Mishi, (2023) who observed that by working from home, employees put in extra hours working on organizational projects. Due to the work-from-home policy in most organizations, there has been a separation of work groups.

Also as noted by Bick, Blandin and Mertens (2020) some employees using digital technologies in carrying out their assigned job responsibility, may lack the necessary experience especially those required to work from home both during and after the COVID saga, as this is regarded as a “new normal” which they may require time to master.

5. Theoretical Review

The goal-setting theory proposed by Edwin Locke in 1968 suggests that the goals an individual employee set for himself play a key role in motivating him for superior productivity. Adding that managers will need to develop the skill of knowing how to engage employees in mutual goal setting exercise corresponding employee expectations with organizational goals and provides feedback on their regular performance. In the goal-setting theory Edwin Locke (1968) noted that the ability of employees’ achieving to their goals is through the creation of work

environment that is considered fit, comfortable, satisfactory, and motivating to employees. Thus, an environment with the right technology will improve employee's productivity and organizational goals.

6. Methodology

6.1 Research Design

Saunders and Lee (2017) defined a research design as the means intended to conduct the work. The survey research allows for a sizeable amount of reliable data to be collected as it involves the sampling of representatives of the population to proffer solutions to research questions (Bryman, Bell, and Harle, 2015). Thus, the survey research design was adopted for this study.

6.2 Population, Sample Size and Sampling Technique

The sample size of this study consists of 200 staff of a Federal Institution in Benin City, Edo State. The staff comprises of both academic and non-academic staff of the institution. The population was gotten from the records of the Registrar’s Office in 2024. The study adopted the stratified and simple random sampling technique in obtaining the sample size conveniently. The stratified sampling technique ensured employees from various departments were captured in the study; thus, they were divided into strata. While the simple random sampling ensured that all employees had a fair and equal chance of been selected into the sample.

6.3 Research Instrument, Validity and Reliability of Research Instrument

Bryman and Cramer (2012) asserted that data collection and analysis are reliant on the methodological approach used. Since the survey research involves the collection of primary data, the questionnaire response format was the data collection instrument. Primary data are the first-hand experience collected data that are reliable, authentic, and objective (Kabir, 2016). Being a survey research design, copies of questionnaire were distributed to elicit required data.

The basic requirement for a good measurement is content validity, which means that the measurement items in an instrument cover the major content of a construct. Thus, a pilot study was conducted and reviewed by five academics to comment on the appropriateness of the research constructs. Based on their feedback, redundant and ambiguous items was either modified or eliminated. While Cronbach’s alpha which measures the internal consistency among indicators, had a high value of 0.86.

6.4 Model Specification

The model depicts the functional relationship between digitalization and employee productivity. The SMART PLS software was employed in performing the regression analysis.

Model:

$$EP = f(IPI, WLB, JA, TECO) \dots\dots\dots (1.1)$$

Econometrically, the model is stated as:
 $EP_i = \alpha_0 + \alpha_1 IPI_i + \alpha_2 WLB_i + \alpha_3 JA_i + \alpha_4 TECO_i + \xi_i \dots\dots\dots (1.2)$

Where:

- EP = Employee Productivity
- IPI = In-Person Interaction
- WLB = Work-Life Balance
- JA = Job Autonomy
- TECO = Telecommuting
- ξ = Error term

A priori sign/ expectation: $\alpha_0 > 0, \alpha_1 > 0, \alpha_2 > 0, \alpha_3 > 0, \alpha_4 > 0 \dots\dots\dots (1.3)$

α_0 = Parametric constant, $\alpha_1, \alpha_2, \alpha_3, \alpha_4$ = Parametric coefficient

6.5 Data Analysis and Interpretation

This section provides a detailed description of the demographic information of respondents that were sampled in the study. This information can be seen from the table below:

Table 1: Staff Demographic Information

Variable	Category	Frequency	Percentage
Gender	Male	115	57.5
	Female	85	42.5
	Total	200	100.0
Age	18-25	50	25.0
	26-33	111	55.5
	34-41	35	17.5
	42-above	4	2.0
	Total	200	100.0
Education	SSCE	21	10.5

	ND	39	19.5
	HND	63	31.5
	BSC	71	35.5
	MSC	6	3.0
	PHD	0	0
	Total	200	100.0
Staff	Non-Academic	50	25.0
	Academic	150	75.0
	Total	200	100.0
Digital Usage	Yes	199	99.5
	No	1	0.5
	Total	200	100

Source: Researcher’s Fieldwork and Computation (SPSS 22.0) 2024

Table 1 above shows the demographic data of respondents. Where it was seen that from the total number of respondents in the study, 115 (57.5%) were male and 85 (42.5%) were females. Thus, we can say that there were more male in the study. The table also considered the age of respondents, and it was seen that 50 (25.0%) were between the ages of 18-25, 111 (55.5%) respondents were between 26-33 years of age, 35 (17.5%) were respondents between the ages of 34-41 and 4 (2.0%) were 40 years and above. From this we can see that the workforce is made up of young and vibrant individuals.

This section further analyzed the highest educational level of respondents, where it was discovered that 21 (10.5%) respondents were SSCE holders, 39 (19.5%) were ND degree holders, respondents with HND degree were 63 (31.5%) of the total population, 71 (35.5%) respondents were BSC degree holders and 6 (3.0%) were MSC degree holders. The table also considered the category of workers, where it was seen that from the total number of respondents sampled, 50 (25.0%) were non-academic staff, while 150 (75.0%) were academic staff. Lastly, the table also analyzed if employees made use of digital technology during the COVID era, 199 (99.5) of respondents said yes, while 1 (0.5) respondent said no. therefore we can see that the number of employees that made use of digital technology in carrying out their job responsibilities during the COVID era supersedes those that did not.

7. Data Analysis and Presentation

Here, the factor loadings for each item, validity and reliability is presented below:

Exploratory Factor Analysis

Table 2: Pattern matrix shows the factor loadings for each of the factor.

Item	F1-IPI	F2-WLB	F3-JA	F4-TECO
Digitalization				
IPI1	0.811			
IPI2	0.798			
IPI3	0.717			
IPI4	0.735			
WLB1		0.782		
WLB2		0.722		
WLB3		0.792		
WLB4		0.757		
JA1			0.624	
JA2			0.601	

JA3			0.609		
TECO1				0.821	
TECO2				0.869	
TECO3				0.842	
TECO4				0.795	
Item					
(b) Employee Productivity	F1-EP				
EP1	0.798				
EP2	0.796				
EP3	0.863				
EP4	0.877				
EP5	0.762				

Source: Researchers' computation (2024)

Assessing Validity

The table below present means, standard deviations, and reliability. Nunnally (1978) noted that values above 0.70 is acceptable.

Table 3: Means, standard deviations, and reliability of (a) digitalization and (b) employee productivity

Variables	Mean	SD	1	2	3	Reliability
(a) Digitalization						
1. In-person interaction	4.61	0.4	-			0.803
2. Work-Life balance	4.83	0.4	0.12*			0.794
3. Job Autonomy	4.52	0.3	0.620	0.27**0		0.718
4. Telecommuting	4.67	0.4	.29	.14	0.06*	0.841
(b) Employee Productivity						
	4.79	0.53				0.843
** . Correlation is significant at the 0.01 level (2-tailed).						
* . Correlation is significant at the 0.05 level (2-tailed).						

Test of Hypotheses

The results of the regression analysis are presented below:

Table 4: Result for regression analysis

Hypothesis	Relationship	t-statistics	p-value	Result
H1	IPI1-EP	3.634	.021	Supported
	IPI2-EP	4.221	***	Supported
	IPI3-EP	5..317	***	Supported
	IPI4-EP	3.945	.022	Supported
H2	WLB1-EP	6.325	***	Supported
	WLB2-EP	5.873	***	Supported
	WLB3-EP	7.742	***	Supported
	WLB4-EP	5.384	***	Supported
	JA1-EP	5.773	.023	Supported

H3	JA2-EP	6.313	.059	Unsupported
	JA3-EP	4.446	.063	Unsupported
	JA4-EP	3.601	.057	Unsupported
H4	TECO1-EP	6.732	***	Supported
	TECO2-EP	4.518	***	Supported
	TECO3-EP	8.399	***	Supported
	TECO4-EP	2.074	.032	Supported
	TECO5-EP	2.177	.030	Supported

Source: Researchers' computation (2024)

The statistical significance of Hypothesis 1 confirms that digitalization has high impact on employee productivity with t-value above 1.96. However, the impact from each item on employee productivity differs. Hypothesis 2 shows that there is a significant and positive relationship with employee productivity with t-value above 1.96. Hypothesis 3 shows that there is an insignificant but positive relationship with employee productivity with t-value above 1.96. Lastly, Hypothesis 4 reveals a positive and significant relationship with employee productivity.

8. Discussion of Findings

In-person Reduction

Generally, it was found that while in-person interactions (face to face) were reduced, the use of digital technologies made work easier and productivity higher. These findings corroborate with Verhoef et al., (2019) that digitalization in organizations has led to redesigning of business models that has invariably impacted positively work performance and productivity of workers.

Work-Family Balance

Findings showed that telecommuting during the COVID era helped staff to meet both organizational and family needs. More so, telecommuting helped increase their productivity level and being able to spend time with their respective families. Findings of Molina (2023) support the position of this study that flexibility brought about by telecommuting is a contributing factor to effectively balance work and family life due to workers flexible working time and location.

Job Autonomy

The study found telecommuting as a digital technology afforded employees the opportunity to

work at their own pace. Findings according to this study showed that by telecommuting during the COVID era, employees had the responsibility to make more decisions on the job and had more control. Huu (2023) empirical evidence supports this study by revealing that employees with greater digital job autonomy are more committed to work improved work performance, thereby leading to improved employee productivity. Thus, organizations should create a supportive and collaborative environment to improve digital job autonomy of employees.

Telecommuting

Through the course of this study, it was discovered that the adoption of digitalization during the COVID era was instrumental to the meeting of organizational goals and improving employee productivity. The study discovered that telecommuting which was one of the various ways in which some employees carried out their job responsibilities, made it possible for employees to have more job autonomy which gave them the opportunity to work at their own pace, more decision making and control. These findings support the study of Onyemaechi, et al (2018) that telecommuting permits employees to be more adaptable and flexible as regards their job schedules, thereby improving employee productivity. It was also discovered that through telecommuting, employees were able to achieve both organizational and family need as they get to spend more time with their families while also paying attention to their job responsibilities and this as seen in the study helped in improving the productivity of employees.

Challenges

The challenges faced by employees in the adoption of digital technology and telecommuting during and after the COVID among the staff according to the descriptive analyses showed that adopting digitalization is more expensive than in-person service

delivery and that using digital technology require having special knowledge. Furthermore, poor facilities, lack of maintenance and poor network signal can restrict the flow of information and can affect work productivity. Despite, ongoing collaborative effort between government and tech giant to curb the inequalities or digital deficiency in Nigeria through the creation and support of e-learning facilities, Sam (2019) identified some challenging factors of telecommuting in Nigeria that support the findings of this study as lack of education, low income and poor electrical infrastructures.

Despite the success of digital technologies, the study showed that challenges such as the cost of adopting digital technology, cost of training, lack of maintenance and poor network coverage especially for those working remotely from home still exist in Nigeria. Nevertheless, it was discovered employees that made use of digital technologies during the COVID era were generally productive as the organization continued to meet its obligations to employees and their customer base across the country.

9. Conclusion

Employee productivity is one way in which organizations can effectively meet consumers' expectations of receiving quality goods or service as without improving on the productivity of employees within the organization will gradually lead to the loss of consumers or organizational customer base. This was without doubt in the COVID era as the uncertainty that accompanied global pandemic greatly affected the productivity of employees in most organizations which saw the collapse of some businesses while organizations that were able to navigate through the sea of uncertainty during the COVID era by ensuring that they increased the productivity of their employees continued to thrive even to the post Covid era. To this end, it is important for organizations to continue putting resources in place that will help them improve or develop new and innovative ways in which they can adopt digitalization in their business operation as this will be instrumental to their longevity in the business environment and meets the business long term goal and objectives.

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