Innovations

Impact of digital management on organization productivity in Eti- Osa local government area of Lagos state

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Abstract

This research identified the effect of big data management on organisational productivity. It ascertained the impact of cyber-physical system management on organization productivity; it investigated the impact of interoperability on organisational productivity; and also established the impact of internet of things (IoT) management on organizational productivity all to assess the impact of digital management on organizational productivity. The instrument of the research design used was a questionnaire. One hundred and fifty (150) questions were administered to MTN staff in ETI-OSA local government area. In analyzing the questionnaire, the data analytical procedure of tables and percentages was used in classifying data, while the inferential statistic of Chi-square was used in the testing of hypotheses. The study discovered that there is a significant positive impact of big data management on organizational productivity. It was also concluded that organizations must adhere to the usage of big digital management in other to achieve high productivity. It was recommended that every organization in this era should embark on in-service to get its staff acquainted with the model of big data management as it will affect the entire organizational productivity.

Keywords:1.*Digital, 2.Management, 3.Productivity,4.Organisation, 5.Internet of Things (IoT)*

1. Introduction

The use of digital administration in all facets of human existence is one breakthrough that cannot be disputed by anybody, not even the most rudimentary. It is seen as the byproduct of technology that has transformed the globe into a global village where knowledge is readily available to contemporary individuals. It penetrates every aspect of life, including corporate governance, banking, education, and business. This knowledge led Foerster-Metz et al. (2018) to claim that the dynamics of the workforce inside organisations are being changed by digital technologies such as sophisticated algorithms, robots, and analytics.The world is becoming more and more digitalized and transparent for all stakeholders as a result of these new technologies, algorithms, interconnections, and large data storage. They continued by saying that it is no longer only about using marketing to persuade customers, using business branding to

keep staff, or finding methods to streamline operations or automate manufacturing. These days, understanding the interdependencies and impacts on the fundamentals of organisationalbehaviour, namely the interaction between the two determinants of technology and people, is just as important as understanding the integration and utilisation of innovative technologies and business models. This has the conclusion that the management of digitalization is a fundamental element of contemporary organisational productivity.

In this contemporary period of quick high-technology advances, digital management in the form of technological development in the organisational environment will continue to accelerate the future. Hence, the proper integration of relevant technology into the organisation is crucial to its productivity. Organizations have undergone a full reorganisation as a result of technological breakthroughs that have made corporate operations more efficient and seamless than before. A necessary condition for obtaining high performance, it is thought, is having an adequate and suitable digital management infrastructure backed by efficient information technology management.Together with operations, goods, and services offered by organisations, information technology is essential to many basic company tasks. More than 50% of businesses' recent spending is attributed to digital management and related areas, yet efficient management of such significant investments yields important outcomes that are crucial to the effectiveness and efficiency of organisations. It has been noted that previous investments in information technology have failed to produce the anticipated results due to insufficient alignment of digital management with a business (Lakhwani et al.,2020).

It should be highlighted that the concrete action system model created by Gagnon and Landry and improved by Dragon, which forms the basis of current digital management and boosts organisational efficiency, lays out a plan for examining how technological advancements influence unionised workplaces. This road map, referred to as the concrete action system, is thought to work towards identifying and characterising the key players involved in the activity of implementing systems before establishing the linkages between these players. The idea of a concrete action system is founded on the idea that an organisation is a social system, and that social systems dynamics are rooted in the behaviour of groups of actors who adopt specific tactics in a set of connections that are subject to environmental limitations.Organizations are made up of people and groups with diverse backgrounds, roles, and perhaps conflicting goals. Relationships vary depending on the situation and are not explicitly stated in a formal structure like an organisational chart. Systems development in such a setting offers the chance and the setting for possible conflicts between interests, objectives, and values that go beyond technology. This concept offers a perfect partnership between human resources and digital management that finally boosts organisational efficiency (Gagnon & Dragon, 2002).

The incapacity to compete in the current digitization process is one of the issues that conventional companies, which are based on a hierarchical structure, face. Companies are being forced to reconsider their organisational models as a result of digital innovation. In several areas, some businesses are demonstrating a greater capacity to use digital technology to their benefit. Conventional businesses struggle to adapt and change quickly enough to keep up with the pace of digital disruption because of their hierarchical, centralised, closed, top-down organisational structures. Traditional businesses must reconsider their organisational structures, absorb lessons from digital disruptors, and change their organisational structures and mindsets to survive. People are making the shift to a digital economy and society.Ecosystems for businesses are always changing. Businesses are progressively altering their company operations with cutting-edge digital technology in this hyper-competitive era. The time for debating and evaluating the effects of digital transformation on business is over; now is the time for concrete actions (Mubarak et al., 2019).

The aforementioned points indicate that digital management is comprehensive, and as a result, it included big data management, which is a catch-all term for any technique used to process a significant amount of data, knowledge, or information. This includes data capture, safety, transmission, storing, analysis, search, and confidentiality, as well as data that is both structured and unstructured. Cyber-Physical Systems (CPS), a new generation of systems with integrated computational and physical capabilities that can interact with people through various modalities, might also be considered a subset of digital management. When we combine the aforementioned factors, we get interoperability, which may as well be referred to as digital management.It is the interaction of human beings, cyber-physical systems, and IoT-enabled smart factories. Last but not least, digital management addresses the Internet of Things (IoT), which has emerged in recent years as the most important topic in a variety of businesses. IoT is not just a popular buzzword in corporate circles; it is also a growing trend, a well-established strategy, and a revolutionary technology (Mubarak et al., 2019).

The above facets of digital management could improve organisational productivity. As a result, productivity growth has been regarded as the cornerstone for economic success, a requirement for national development, and a key metric of organisational competitiveness, according to Sobhani (2008). Whereas Lakhwani et al. (2020) noted that an organization's capacity to transform input resources, such as labour, materials, machinery, and so on, into goods and services may be expressed as a ratio. Companies must be able to increase the productivity of their resources if they want to stay competitive in this economy.

Statement of the Problem

Several studies, including one by Foerster-Metz et al. (2018), claimed that the dynamics of the workforce inside organisations are changing as a result of digital technologies including sophisticated algorithms, robots, and analytics. Much of the recent research on this topic has understudied the holistic point of view and its effects on organisationalbehaviour in favour of the technology side. In this case, organisational productivity is favourably and considerably impacted by technical progress and IT infrastructure, but IT knowledge management has a significant but considerable influence on the organisational productivity of IT organisations. The efficient integration of relevant technology into the organisation is essential for its efficiency. Organizations have undergone a full reorganisation as a result of technological breakthroughs that have made corporate operations more efficient and seamless than before (Lakhwani et al., 2020).

For instance, it is now a known fact that digital management, which is based on connectivity, has transformed the economy from one that is mostly physical to one that is managed by software, and that information technology has become an essential component of contemporary business and society. Buzzwords like "digitalization," "Internet of Things," "big data," "robotics," "automation," "mobility," and others are commonplace in this setting and are being discussed in social media, politics, and economics. If properly utilised, these facets of digital management are thought to have a variety of effects on organisational productivity.

Although digital management has a significant impact on organisational productivity, the average Nigerian organisation has not been able to fully implement it due to the availability of structures like constant power supply, the cost of running modern digital management in the sense of maintenance, technical know-how in the sense of human resources, and the high cost of purchasing modern machines have acted as an obstacle to the optimum performance. The aforementioned reviews of various types of

literature have shown that research has been done on digital management, a related discipline. However, pieces of evidence have also shown that digital management in Nigeria continues to struggle with many issues that have an impact on their productivity. Yet the extent to which digital management affected productivity in MTN in Eti-Osa Southwest Nigeria has not adequately been explored, hence, this research.

2. Methodology

The population of the Study

The population of this study consisted of all 241staff of MTN Eti-Osa.

Sampling, Procedure and Sample Size

The sample consists of one hundredand fifty (150) staff which were drawn from the population of the study. A simple random sampling technique was used to select one hundred and fifty staff in MTN in Eti-Osa. These make up the total sample size of one hundred and fifty (150) respondents. In the first instance, the Yaro Yamani formula was used to determine the sample size. The formula is given below:

$$\text{n} = \frac{N}{1 + N(e)2}$$

Where n is the sample size, N is the population size which is 241; e is the error limit which is 0.05. When the values are put in the equation, it yielded 150.3900 which is approximately 150 respondents.

The implication of this is that:

$$\text{n} = \frac{N}{1 + N(e)2}$$

$$\text{n} = {}^{241}/_{1 + 241(0.05)^2}$$

$$\text{n} = \frac{241}{1+241(0.0025)}$$

$$\text{n} = \frac{241}{1+0.6025}$$

$$\text{n} = \frac{241}{1.6025}$$

$$\text{n} = 150.39$$

$$\text{n} = 150$$

Method of Data Analysis

Data wereanalyzed using both descriptive and inferential statistics. Descriptive statistics of tables and percentageswere used for data classification while inferential statistics of Chi-Square were used for testing hypotheses.

3. Discussion and Results

Table 1: Gender Distribution

Gender	Frequency	Percent
Male	76	50.7
Female	74	49.3
Total	**150**	**100.0**

Source: Author's Field Survey, 2021

The evaluation of table 1 shows that there are 150 respondents involved in this study, of which 74 respondents are females which represent 49.3 percent of the total respondents and 76 respondents are males which represents 50.7 percent of the total respondents.

Table 2: Age Distribution of the Respondents

Age	Frequency	Percent
20-25 years	62	41.3
26-30 years	52	34.7
31-35 years	25	16.7
36-40 years	3	2.0
40-45 years	6	4.0
46-50 years	2	1.3
Total	**150**	**100.0**

Source: Author's Field Survey, 2021

The evaluation of table 2 indicates that out of the one hundred and fifty respondents involved in this study, 62 which represent 41.3 percent are between the age of 20 and 25 years, 52 which represents 34.7 percent are between the age of 26 and 30 years, 25 which represents 16.7 percent are within the age of 31 and 35 years, three of them which represent 2 percent are within the age of 36-40 years, 6 of them which represents 4 percent of the total respondents are within the age of 40-45 years, while two people which represent 1.3 percent are within the age of 46-50 years.

Table 3: Level of Education Distribution of the Respondents

Level of Education	Frequency	Percent
OND	59	39.3
HND	61	40.7
BSc/B.Ed.	26	17.3
MSc/MEd	4	2.7
Total	**150**	**100.0**

Source: Author's Field Survey, 2021

The analysis of table 3 indicates that 59 of the respondents which represent 39.3 percent indicated that they hold OND, 61 which represent 40.7 percent of the total respondents indicated that they hold HND, likewise, 26 of the respondents which represent 17.3 percent of the total respondents indicated that they hold BSc/B.Ed., while four respondents which represent 2.7 percent of the total respondents indicated that they hold MSc/Med.

Test of Hypotheses

Data generated were analyzed using the t-test statistical tool via the Statistical Package for Social Science (SPSS).

Decision rule:If P-value is less than 5% (0.05) significant level, the null hypothesis is rejected. However, P-value is greater than a 5% (0.05) significant level, the null hypothesis is accepted.

Hypothesis One:

H_0: Big data management has no positive impact on organizational productivity

H_1: Big data management has a positive impact on organizational productivity

Table 4: Chi-Square table of Big Data and Organizational Productivity

Variables	N	$\overline{x}$	df	X^2-Cal	P-Value	L-Sign
BigData	150	24.74	132	288.60	0.00	0.05
Productivity	150	20.76				

The evaluation of table 4 shows that the p-value 0.00 is less than 5 percent or 0.05 levels of significance. This, therefore, implies that the null hypothesis that states that big data management has a positive impact on organizational productivity is rejected; therefore, the alternate hypothesis that statesbig data management has a positive impact on organizational productivity is accepted. There is a significant positive impact of big data management on organizational productivity.

Hypothesis Two:

H_0: Cyber-Physical Systems (CPS) management has no positive impact on organizational productivity

H_1: Cyber-Physical Systems (CPS) management has a positive impact on organizational productivity

Table 5: Chi-Square table of Cyber-Physical Systems and Organizational Productivity

Variables	N	$\overline{x}$	df	X^2-Cal	P-Value	L-Sign
Cyber-Physical Systems	150	20.42	132	556.57	0.00	0.05
Productivity	150	20.76				

The evaluation of table 4 shows that the p-value 0.00 is less than 5 percent or 0.05 levels of significance. This, therefore, implies that the null hypothesis that states that Cyber-Physical Systems (CPS) management has no positive impact on organizational productivity is rejected; therefore, the alternate hypothesis that states Cyber-Physical Systems (CPS) management has a positive impact on organizational productivity is accepted. There is a significant positive impact of Cyber-Physical Systems (CPS) management on organizational productivity.

Hypothesis Three:

H_0: Interoperability management has no positive impact on organizational productivity

H_1: Interoperability management has a positive impact on organizational productivity

Table 6: Chi-Square table of Interoperability and Organizational Productivity

Variables	N	$\overline{x}$	df	X^2-Cal	P-Value	L-Sign
Interoperability	150	20.40	121	189.96	0.00	0.05
Productivity	150	20.76				

The evaluation of table 6 shows that the p-value 0.00 is less than 5 percent or 0.05 levels of significance. This, therefore, implies that the null hypothesis that states that Interoperability management has no positive impact on organizational productivity is rejected; therefore, the alternate hypothesis that states Interoperability management has a positive impact on organizational productivity is accepted. There is a significant positive impact of Interoperability management on organizational productivity.

Hypothesis Four:

H_0: Internet of Things (IoT) management has no positive impact on organizational productivity

H_1: Internet of Things (IoT) management has a positive impact on organizational productivity

Table 7: Chi-Square table of Internet of Things (IoT) and Organizational Productivity

Variables	N	$\overline{x}$	df	X^2-Cal	P-Value	L-Sign
Internet of Things (IoT)	150	19.92	143	334.00	0.00	0.05
Productivity	150	20.76				

The evaluation of table 7 shows that the p-value 0.00 is less than 5 percent or 0.05 levels of significance. This, therefore, implies that the null hypothesis that states that internet of things (IoT) management has no positive impact on organizational productivity is rejected; therefore, the alternate hypothesis that states internet of things (IoT) management has a positive impact on organizational productivity is accepted. There is a significant positive impact of internet of things (IoT) management on organizational productivity.

4. Discussion of Findings

The conclusions drawn from the data analysis in the hypothesis show that big data management significantly boosts corporate productivity. This conclusion supports the earlier claim made by Yu, Chavez, Jacobs, and Feng (2018) that there are several methods for gauging organisational productivity. The most frequent strategy used is to evaluate the market or financial performance. Big data refers to information assets with large volume, high velocity, and/or high diversity that call for creative, cost-effective methods of information processing to improve insight, decision-making, and process automation. The qualities of big datahigh volume, higher velocity, and wide varietythat boost organisational productivity are the main subject of this article.

The results support Muhammad and Syed's (2020) earlier claim that big data analytics (ABDA) applications have garnered a lot of attention from academics and industry professionals during the past ten years. Recent research in a variety of sectors showed that the ABDA is a significant factor in organisational productivity. Additionally, there has been quick progress in the executives' recognition of the potential advantages of the ABDA. Globally, annual public and private spending on the use of big data analytics has skyrocketed to billions of dollars. The ABDA may alter the game for a company by increasing productivity and efficiency due to its great strategic and operational potential. High-performing organizations consider the ABDA as a critical differentiator and a significant factor for their growth.

The conclusion drawn from the data analysis in hypothesis two suggests that the management of Cyber-Physical Systems (CPS) has a considerable beneficial influence on organisational productivity. This result supports the claim made by Oks, Fritzsche, and Moslein (2018) that there is a broad potential for industrial value creation due to the significant digitalization of industry and the advanced deployment of cyber-physical systems (CPS) in manufacturing. Systematic approaches to technical and organisational difficulties are required to guarantee that the engineering processes of these systems are effective.One of the main forces influencing change at the moment is continuous digitalization. It has an impact on many aspects of people's lives as well as the overall social and economic system. CPS accelerates production capacities in a self-configuring, self-optimizing, adaptive, and context-aware manner by combining technologies like big data, artificial intelligence, and innovative kinds of human-machine interaction.

According to the third hypothesis's conclusion, interoperability management significantly increases corporate productivity. This result supports Mubarak et al(2019) .'s earlier claim that interoperability management is the connectivity of cyber-physical systems, people, and smart factories talking with one

another through IoT. Manufacturing partners can effectively and error-free transmits a variety of information in this way. Translation and transmission without errors are made possible via interoperability. It is a prerequisite for any system of contemporary technology. Interoperability is therefore thought to increase organisational productivity.

The conclusion drawn from hypothesis four shows that internet of things (IoT) management significantly boosts corporate productivity. This result supports the claim made by Brous, Herder, and Janssen (2019), who claim that the Internet of Things (IoT) is a developing network of items that connect other internet-enabled devices through the Internet. We can remotely monitor and manage the physical world thanks to IoT. As a result, implementing IoT may offer several advantages for businesses, and the large data that is generated may help businesses get insightful information. However, risks and factors abound which may have significant, unintended effects on organizations and their intention in utilizing IoT. IoT may become part of the structures which constrain individual actions and improve organizational productivity.

The results are also consistent with Batrawi and Percudan's (2017) claim that organisations and business environments have undergone significant change over the past few decades. They note the shift towards digitalization and the way Information Technology (IT) has contributed to the continuously changing drivers of today's markets. These changes range from the average size of organisations to the global expansion of projects and megaprojects. Essentially, the development of Project Management (PM) disciplines and the Internet of Things (IoT) technologies that grasp the project throughout its lifespan was required by the growth of global markets and an organisation working on several projects at once.

Contrarily, the conclusion drawn from hypothesis four is consistent with Gomes and Osman (2019), who found that the IoT has had a significant influence on firms' present business plans. This ongoing process of change is expected to play a significant role in the creation of wholly new business models and marketplaces, as well as have a growing impact on how organisations and sectors as a whole conduct their operations. . The development of IoT technologies and their anticipated exponential spread across all spheres of society lead one to the conclusion that the future offers many opportunities for organisations looking to explore new methods of capturing and creating value, but that there are also many challenges to be overcome.

5. Conclusion

Based on the results, the study concluded that digital management is essential for a business to succeed and be productive. As a result, big data management has a positive impact on organisational productivity, as does the application of Cyber-Physical Systems (CPS) management in contemporary businesses or industries, as well as the combination of big data and CPS in terms of interoperability management. Finally, moving the entire management system into a web-assisted platform has a positive impact on organisational productivity.

6. Recommendations

Based on the conclusion of this study, the following recommendations are made in this study:

- Every organization in this era should embark on in-service to get its staff acquitted with the model of big data management as it will affect the entire organizational productivity.
- An organization should undertake research and development projects and come out with results that will enhance the application of Cyber-Physical Systems (CPS) management in modern-day companies or industries.
- More information and technology personnel can be trained on the combination of big data and Physical Systems to be efficient in Interoperability management.
- All the aspects of the company should be moved into a web-assisted platform in terms of internet of things (IoT) management.

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