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Adaptive artificial intelligence and effective office management systems of deposit money banks In Rivers State, Nigeria

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Abstract
This study, investigated the relationship between artificial intelligence and effective office management systems of deposit money banks in Rivers State. As a correlational study, data was obtained from purposively selected management staff within five deposit money banks in Rivers State, using the questionnaire. Three null hypotheses addressing the role of adaptive artificial intelligence (AI) in the outcome of office management systems such as visitors tracking, centralization of communication and the management of documents, were tested. Findings revealed a significant relationship between all identified variables, hence a rejection of all related null hypothetical statements. It was concluded that the adoption of adaptive AI, necessitates the organisations responsiveness and reinforces its capacity for addressing the emerging office management demands and standards across local and global industries. It was therefore recommended, that the management of the deposit money banks in Rivers State, invest in and also leverage adaptive AI, in bridging office management system lapses, creating a more harmonious and integrated workplace for the organisation.

Keywords: Adaptive artificial intelligence, office management systems, dynamic capabilities, deposit money banks in Nigeria

Introduction

Office management is central to effective coordination and functional performance (Ayandele & Adeoye, 2010) [8]. Such allow for improved documentation, communication flow, functional integration through support networks, digital tools and platforms which facilitate video chats and conferencing; thus, enabling increased administrative control and efficiency within the workplace. Udodiugwu (2023) [24] identified a growing strain across most offices in the Nigerian banking sector. According to Udodiugwu (2023) [24], these stem from issues such as poor scheduling of tasks and responsibilities, long queues and crowding of banking halls, inconsistent networks and weak function integration. Udodiugwu (2023) [24] opined that these continue to impact the performance of the banks when it comes to customer service, and satisfaction; leading to its inefficiency and inability to effectively address its daily operational objectives.

Similarly, Agarwal (2020) [4] opined that to be effective, organisations must constantly upgrade and align their systems with prevailing technology models and frameworks in their industry. Such upgrades or alignment, anchor on the need for operational standards, emphasizing improved functionality, security upgrades, and enhanced infrastructure comprising robust database systems with requisite storage spaces and features to accommodate the growing information concerns of the organisation and its activities. Research (Al-Sayyed *et al*., 2021; Amer, 2018) [6, 7] shows strong support for organisational learning, and innovative culture and leadership buy-in as positively influencing office management systems. Adejola *et al*. (2024) [2] identified the need for development in the Nigerian banking industry through their position on the imperatives of technology advancement and competency. However, within the lens of technology advancement is a subject scarcely addressed, that is Adaptive Artificial Intelligence (AI).

Adaptive AI describes technology systems that are able to change in real-time and in line with new data or customer interaction (Joshi, 2023) [13]. According to research (Acermoglu & Restrepo, 2018; Adeshina, 2020) [3] adaptive AI present the organisation with the capacity to mirror the changes in its environment, enhancing its change readiness and extent of responsiveness. Likewise, Chukwu and Nwachukwu (2022) [9] asserted that through adaptive AI, management as well as organisations are able to bridge standard and change concerns, reconfiguring the organisation and its features on a timely basis and in view of the development within their markets and industry. This paper, however, focused on the relationship between adaptive ai and the effectiveness office management systems within the Nigerian banking sector. This focus not only extends research as it addresses the less explored concerns of the role of adaptive ai and its adoption in the Nigerian banking industry, but it also contributes through its empirical investigation of the variables, thus establishing related practices and the nature of the relationship between the variables.

Literature Review

Dynamic Capabilities Theory

Change is inevitable. In order to survive and thrive, organisations must consistently learn and develop the necessary skills and capabilities to thrive and compete, despite the changes or pace of evolution within its environment or market. In addressing this concern, Teece *et al*. (1999) proposed the dynamic capabilities theory. Teece *et al*. (1999) argued that to effectively cope during change, organisations must be able to adapt and develop related competencies that ensure not only operational continuity, but also the ability to innovatively engage the market and that way competitively advance the position and interest of the organisation. Central to the dynamic capability's theory

is the view that through competence or capacity development, organisations can sense, seize and reconfigure themselves in line with exploiting the opportunities and advantages availed in its environment.

The dynamic capabilities theory is useful in explaining the role of adaptive ai in the outcome of effective office management systems. Through its emphasis on learning and competency development for engaging the changes and dynamicity of the market, the theory offers a position that is echoed by Omoge *et al*. (2022) [18] assertions on the need for technology systems that are adaptive. Such technology systems should also be consistent with the security and robustness needs of the business, and that way, effective in enhancing the efficiency and competitiveness of the organization. Adaptive AI systems are not only capable of self-modifications and real-time reconfigurations, they also enrich the dynamism of the organisation, suggesting and advancing processes and features that resonate with global models and standards, thus offering real value and satisfaction to clients through innovative and efficient actions and approaches (Uge, 2023; Nwala & Uche, 2020; Shang & Zhang, 2022) [16, 17, 23, 25].

The Concept of Adaptive AI

Adaptive AI describes systems that are designed to be responsive in their operations. They are intelligent systems that are capable of modifying their own features in real-time and that way, able to address the needs and concerns of the customers or the organisation in view of new data or feedback (Wheeler, 2020) [27]. Akinbami and Johnson (2022) [5] opined that the recent emergence of AI has in a short-time revolutionized societies, economies and businesses. Organisations have leveraged on AI as a competitive tool as it aids innovation and integrates various processes, thus improving organisational efficiency and effectiveness. Examples of adaptive AI are such applied by some logistics company in the optimization of routes, and also by e-businesses and streaming channels like Netflix and YouTube in their personalisation of recommendations and services. Adaptive AI systems reinforce the organisations synchrony with its market and enables the organisation's reconfiguring of its system to match the conditions and changing preferences of its environment or market (Oyewobi & Lawal, 2023) [20].

Office Management Systems

Office management systems are the framework of interconnected events, activities and processes that drive the workplace or office functions in the organisation (Scott-Poole, 2018) [22]. Scott-Poole (2018) [22] described office management systems as the integrated set of factors that are considered a necessity in ensuring operational efficiency and effectiveness. As digital tools, office management systems serve to integrate various actions and platforms responsible for the centralization of communication, workflow automation, storage of documents and the security, visitors tracking and management as well as the transfer of files across levels and functions in the workplace. Three of these features are specifically addressed in this research, and these are visitors tracking, centralization of communication and the management of documents.

Visitors tracking and management allow for improved control over office crowding. Tracking systems enable office administrators to understand customer or visitors' behaviour, highlighting concerns such as peak demand or pressure hours and thus informs on when to increase customer service support staff and when to decrease such, so as to achieve efficiency and adequately address customer concerns in due time (Unoka, 2010; Goodmanson, 2017) [11, 26]. Similarly, the centralization of communication, creates a system of control and effective message transmissions that are verifiable. This is essential for information management and accessibility, while at the same time ensuring monitoring to avoid rumours and false information (Scott-Poole, 2018) [22]. The management of documents describes the availing of systems that address the storage, and handling of files and documents in the organisation. These are managed in a way that not only allows or increases their accessibility, but also facilitates a securing of such files, particularly sensitive ones, granting access to only authorized personnel (Scott-Poole, 2018) [22].

Adaptive Ai in Nigerian Banking Sector

The Nigerian sector is one of its more competitive and dynamic (Adeshina, 2020) [3]. Technology plays a key and multi-faceted role within the sector. From innovatively advancing robust systems that can cater to the financial management needs of a growing population, including the facilitation of feedback for improving service and value, to ensuring the security, and responsiveness of systems to threats and operational lapses or lags (Roll *et al*., 2023; Halippulos & Gkintoni, 2024) [21]. However, technology development within the Nigerian context, even within the banking sector, has been slow, compared to that of the global industry. While AI adoption and application in most global industries have been methodological in its integration in business and industry operations, in Nigeria, concerns over readiness and capacity still hang overhead. More effort and investments are required in advancing AI systems and sustaining such within the Nigerian banking sector (Adejola *et al*., 2024) [2].

Dominant forms of adaptive AI featured within deposit-money banks in Nigeria include as follows: fraud detection systems that allow for quick modifications to new threats and the emergence of tactics for addressing such, service customization in line with tailoring services to suit and substantially address customer preferences (McAfee & Brynjolfsson, 2012) [15]. Within the context of office management, Al-Sayyed *et al*. (2021) [6] identified related challenges such as weak technology infrastructure, change inertia and energy poverty. These factors as Al-Sayyed *et al*. (2021) [6] argued, militate against the success of adaptive AI adoption, and use in the finance industry. Studies (Uge, 2023; Wheeler, 2020; Joshi, 2024) [14, 25, 27] trace the success of adaptive AI not only to management buy-in, but more so, the availability of trained and competent personnel to man and operate related systems and protocols. While this may also be considered an aspect of infrastructure, its emphasis is such that identifies such training as crucial in effectively engaging, sustaining and ensuring that the activities or operations of adaptive AI, are uniquely applied and that way, serve the peculiar competitive and operational concerns of the organisation.

Research, addressing the relationship between adaptive AI and office management systems is however scant within the context of Nigeria. Given the novelty of the concept of adaptive AI and its application in Nigerian banks, most studies offer only a glimpse into such and scarcely address

its link to features like visitors tracking, the centralization of communication, and the management of documents. Adejola *et al*. (2024) [2] posited that while the response to the emergence of AI, has been spontaneous across most developed economies and industries, concerns of distrust, inertia and the lack of infrastructure, has trailed the poor response and disposition of most Nigerian organisations and industries. In this vein, the following hypothetical statements are put forward:

Ho_1: There is no significant relationship between adaptive AI and visitors tracking in deposit money banks in Rivers State

Ho_2: There is no significant relationship between adaptive AI and communication centralization in deposit money banks in Rivers State

Ho_3: There is no significant relationship between adaptive AI and document management in deposit money banks in Rivers State

Methodology

This study adopted a quantitative methodological framework, underpinned by the positivist social research ideology. The correlational design is adopted as the research design for the study. The population for the study consists of five selected deposit money banks in Rivers State. Selection criteria were based on share capital and number of years in operation. From these five banks, five referents were purposively selected in line with supervisory roles centred on the digital processes or actions linked to office management functions and systems in the organisation. The structured questionnaire was adopted as the primary tool for data collection, and instrument for the constructs of adaptive AI (Joshi, 2024) [14] and office management systems (Ayandele & Adeoye, 2010) [8] were based on previous research. The instrument was structured into three main sections. The first (section A), addressed demographic items, the second (section B) addressed the construct of adaptive AI, and the third (section C) addressed the construct of office management systems. The goodness of measure for the instrument, was assessed using both validity (content and face) and reliability (Cronbach alpha) tools, with alpha coefficients for all instruments observed to be substantial (where $\alpha > 0.80$).

Data Analysis and Findings

The analysis on the distribution for the variables and the test for the hypotheses is addressed in this section of the paper. All 25 copies of the administered questionnaire were duly retrieved from the field. Such success was possible as a result of established correspondence channels and follow-ups on participants. Presented in Figure 1 is a population pyramid for the cross-evaluation of the demographic data for the study.

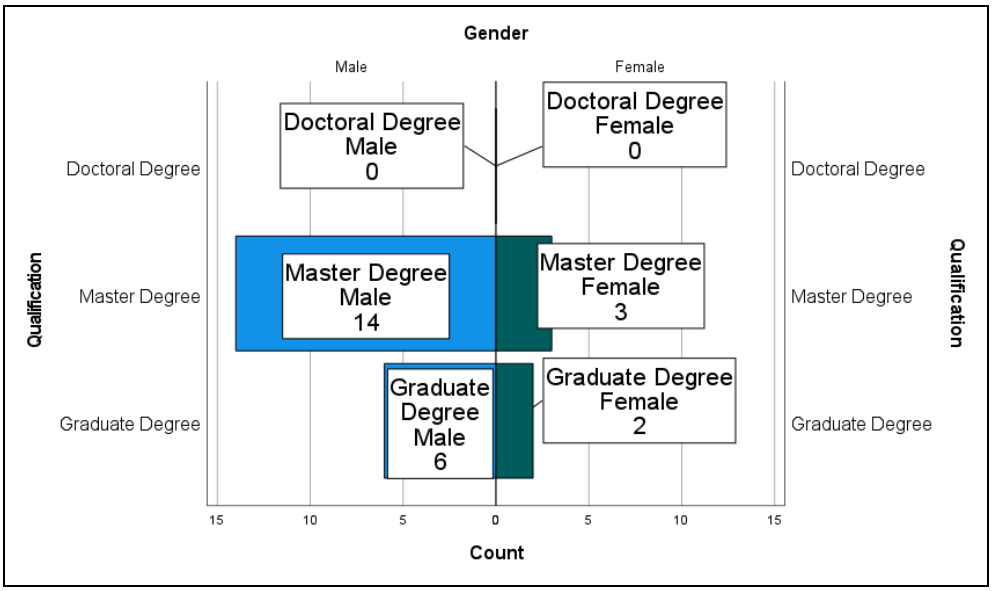

Fig 1: Population pyramid for gender and qualification of the participants

The distribution for the demographic characteristics reveals a dominant male distribution with a higher distribution compared to the female distribution, where male participants with Master qualification (n = 14) and graduate degree (n = 6) have a higher frequency than female with Master degree (n = 3) and graduate degree (n = 2). The univariate analysis on the variables is illustrated on table 1.

Table 1: Univariate data distribution for the variables

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Adaptive AI	25	2.6711	.96624	.012	.464	-1.935	.902
Visitors Tracking	25	2.0533	.59845	.585	.464	-.477	.902
Communication Centralisation	25	2.8933	1.29715	.078	.464	-1.850	.902
Document Management	25	3.0667	1.31233	-.020	.464	-2.026	.902
Valid N (listwise)	25						

Source: Research Survey, 2025

The analysis on the variables, indicates moderate levels of affirmation to their practices. Following an adopted 5-point Likert scaling format, average scores for constructs such as adaptive AI (a = 2.6711), communication centralization (x = 2.8933) and document management (x = 3.0667), while moderate, appear to suggest participants affirmation to their practices and evidence within the deposit money banks, however, the mean distribution for visitors tracking (x = 2.0533) indicates a poor level of affirmation to the variable within the context of the banks. This suggests a low or weak level of practice in line with tracking or monitoring of customers visits and activities in the bank. Presented in table 2 is the correlation analysis for the variables, using the Pearson's Product Moment Correlation Coefficient (PPMCC) tool.

Table 2: Correlation analysis and test for the hypotheses

		Adaptive AI	Visitors Tracking	Communication Centralisation	Document Management
Adaptive AI	Pearson Correlation	1	.645**	.961**	.965**
	Sig. (2-tailed)		.000	.000	.000
	N	25	25	25	25
Visitors Tracking	Pearson Correlation	.645**	1	.479*	.496*
	Sig. (2-tailed)	.000		.015	.012
	N	25	25	25	25
Communication Centralisation	Pearson Correlation	.961**	.479*	1	.915**
	Sig. (2-tailed)	.000	.015		.000
	N	25	25	25	25
Document Management	Pearson Correlation	.965**	.496*	.915**	1
	Sig. (2-tailed)	.000	.012	.000	
	N	25	25	25	25

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

From the test for the hypotheses, it was revealed that adaptive AI has a significant and positive relationship with office management systems involving, visitors tracking (r = 0.645 and P = 0.000), communication centralization (r = 0.961 and P = 0.000) and document management (r = 0.965 and P = 0.000). The test reveals that adaptive AI plays a key role in the organisations office management activities, specifically, the extent to which the organisations are able to track their visitors, centralize their communication and the management of documents. The result from the analysis suggests that relative modifications to adaptive AI practices and forms in the organisation, would also be reflected in the attributes and outcome of office management systems of the deposit money banks. Following the result of the analysis, the three null hypotheses of the study, were all rejected.

Discussion and Implications of the Findings

The relationship between adaptive AI and office management system within Nigerian deposit money banks is revealed as significant and also positive. The evidence generated, clarifies on the nature and direction of the relationship between the variables, demonstrating the particular role of adaptive AI in advancing measures like visitors tracking, centralization of communication and the management of documentation. This outcome reiterates the observations of scholars (Chukwudi *et al*., 2018; Adejola *et al*., 2024; Adeshina, 2020) [2, 3, 10] on the use of adaptive AI in enabling coordination and the efficient management of data or information in the organisation. This agrees with Udodiugwu (2023) [24] view, that technology systems, are important in creating and supporting cohesion in the workplace; harmonizing functions and that way, facilitating an integrated and well-coordinated office space and features. According to Nwala *et al*. (2020) [16, 17], technology systems such as adaptive AI, equip the organisation, enriching its functional as well as operational capacities, but more importantly, interweaving activities such as file or document storage, transfer and accessibility, communication, customer visitation monitoring and tracking and customer experience management.

The findings of this research, resonate with the tenets and general assumptions of the dynamic capabilities' theory; notably, that which recognises dynamism as a capability for coping and dealing with the changes or development of the environment. Joshi (2023) [13] posited that by being deliberate in their learning and development of technology competencies, organisations can maintain their service quality and consistently advance value for their customers. This is possible through the use of tracking systems that draws on data, in understanding customer behavioural trends and visitation patterns (Joshi, 2023; Agarwal, 2020) [4, 13]. However, adaptive AI involves much more than just customer tracking. It allows for a variety of complex activities, all interwoven into a hybrid intelligent system, connecting various functions, and creating a holistic approach toward office management (Uge, 2023) [25]. The findings on the link between adaptive AI and office management system furthers the imperative for office management responsiveness and consistency, in line with building more effective and efficient deposit money banking systems.

Conclusion and Recommendations

Following the findings of this research, adaptive AI is identified as a significant predictor of office management systems, particularly such composed of visitors tracking, centralization of communication and the management of documentation. This position affirms to the role of adaptive AI in stimulating the sensitivity of office management systems, enabling more responsive approaches to managing and coordinating the activities within the office space and context of the deposit money banks. Following this established role of adaptive AI, it is concluded that the adoption and application of adaptive AI, systematically, equips and also enhances the organisations capacity for effectively and efficiently managing its office activities,

processes and practices. In view of this position, the following recommendations are proffered:

1. The leadership or management of deposit money banks in Nigeria should invest in adaptive AI technology systems, and the training of workers in line with actually harnessing the potentials and capacities inherent in such technologies. This is crucial in advancing the organisations functional and operational wellbeing within the industry.
2. It is important that the management of the deposit money banks, establish or reinforce research and development unit that tailor learning activities in accordance with the peculiar characteristics or attributes of the organisation. This is imperative for ensuring technology system and organisation compatibility, thus ensuring efficiency in the application and use of related adaptive AI system.
3. The management of deposit money banks can drive learning and the openness to change through the enactment of rituals and routine re-evaluation or reassessment of actions that serve to ensure consistency in the development and reconfiguration of technology systems to match the changing or dynamic features of the environment of the Nigerian deposit money banks.

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