

# Effect of Digital Human Resource Management Systems on Employee Productivity in the Ondo State Civil Service

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*Abstract- This study examined the effect of Digital Human Resource Management Systems (DHRMS) on employee productivity in the Ondo State Civil Service. Adopting a descriptive survey design, data were collected from 395 civil servants across selected ministries in Ondo State and analyzed using descriptive statistics and Chi-square techniques. The findings revealed that digital literacy significantly influences employee motivation ( $\chi^2 = 766.908$ ,  $df = 16$ ,  $p < .05$ ), employee performance ( $\chi^2 = 626.334$ ,  $df = 16$ ,  $p < .05$ ), and ICT-enabled work processes ( $\chi^2 = 582.066$ ,  $df = 16$ ,  $p < .05$ ). The study concludes that the adoption of digital HR systems enhances employee productivity by improving efficiency, communication, collaboration, and access to organizational resources. It recommends that government invest in digital HR infrastructure, continuous digital literacy training, integrated HRMS platforms, and digital performance management systems.*

**Keywords:** *Digital Human Resource Management, Employee Productivity, Digital Literacy, ICT, Public Sector, Ondo State Civil Service.*

## I. INTRODUCTION

Digital Transformation (DT) has emerged as a top priority for governments worldwide owing to its potential for increased transparency, faster and more accessible services, reduced corruption, and improved efficiency in the public sector. Porrura et al. (2021) characterize it as a shift in institutional culture and organizational practices that leverages Information Communication Technologies (ICTs) to meet the needs of citizens and businesses efficiently, transparently, and securely.

From a global perspective, the African Union's Digital Transformation Strategy for Africa 2020–2030 seeks to harness DT to drive growth, reduce poverty and inequality, and achieve sustainable development goals. In Nigeria, public agencies have progressively adopted digital tools — including

internet and intranet services, electronic record systems, and payroll platforms — to improve service delivery. Notwithstanding this progress, the Ondo State Civil Service continues to grapple with challenges including digital literacy gaps, inadequate ICT infrastructure, and employee resistance to change.

Against this backdrop, this study investigates the effect of Digital Human Resource Management Systems (DHRMS) on employee productivity in the Ondo State Civil Service, focusing on three primary pathways: employee motivation, employee performance, and ICT-moderated work processes.

### Statement of the Problem

Despite the growing emphasis on e-governance, the Nigerian public sector has been constrained by low digital literacy levels, an inadequate technological infrastructure, and bureaucratic inertia. Civil servants in many states including Ondo have limited exposure to digital work tools, and the organizational environment has not always provided the necessary support structures for successful digital adoption. These challenges raise important questions about whether and how digital HR systems can meaningfully improve productivity in this context.

### Objectives of the Study

The specific objectives of this study are to:

- i. Examine the influence of digital literacy on employee motivation.
- ii. Examine the influence of digital literacy on employee performance.
- iii. Assess the effect of ICT access as a moderator between digital literacy and employee productivity.

#### Research Hypotheses

- i. H01: Digital literacy has no significant positive influence on employee motivation.
- ii. H02: Digital literacy does not significantly influence employee performance.
- iii. H03: Access to ICT does not moderate the relationship between digital literacy and employee productivity.

## II. LITERATURE REVIEW

### Conceptual Review

Digital government encompasses the utilization of information and communication technologies and web-based platforms to improve the efficiency and effectiveness of public service delivery (Sani, 2021). This concept extends beyond mere digitization of records to encompass a broader transformation of organizational culture, administrative processes, and citizen engagement mechanisms.

Digital literacy, a central variable in this study, refers to the ability to appropriately use a range of digital devices, applications, and networks to access, manage, integrate, analyze, create, and communicate information (Belshaw & Higgins, 2022). Ferrari (2022) delineates three core domains: information literacy, communication literacy, and content creation literacy. Collectively, these competencies enable employees to leverage technology resources effectively for core work tasks.

Productivity in the public sector is conceptualized as the effectiveness of factors of production in delivering public goods and services (European Productivity Agency, 2003). Unlike the private sector, measurement is complicated by the intangible nature of public outputs — encompassing citizen satisfaction, service accessibility, and governmental legitimacy (Okeke, 2020).

### Theoretical Framework

This study is anchored on two motivational theories: Herzberg's Two-Factor Theory (1964) posits that job satisfaction and dissatisfaction arise from distinct factor sets. Motivators including achievement and recognition drive satisfaction, while hygiene factors such as salary, supervision, and work environment prevent dissatisfaction. In the digital HR context, the

introduction of efficient digital tools may serve as a motivator, directly enhancing employee engagement and performance.

Porter and Lawler's Motivation-Performance Model (1968) elaborate on the relationship between effort, performance, reward, and satisfaction. The model suggests that an employee's skills, traits, and role perception supported by an enabling environment determine performance outcomes. Digital tools that simplify tasks and improve feedback channels are thus expected to strengthen this effort-performance-reward chain.

### Empirical Review

Several empirical studies corroborate the positive relationship between digitalization and employee productivity. Mark and Nzulwa (2018) found that career development programs enabled in part by digital tools contributed to 34.9% of employee performance variance in the NHIF. Kemboi (2024) demonstrated that ICT-supported mentorship and coaching programs enhanced employee retention at the Kenya Post Office Savings Bank. Ragazou et al. (2022), in a review of 765 post-pandemic articles, confirmed widespread organizational integration of emerging technologies including AI, big data, and cloud computing, with measurable productivity gains. In the Nigerian context, Ahmed (2020) observed that digital governance has broken hierarchical chains and improved citizen service. Aliyu (2020) highlighted benefits including reduced revenue leakages, fraud monitoring, improved communication, and simplified storage. These gains, however, are tempered by challenges of digital literacy gaps, infrastructure deficits, and cybersecurity vulnerabilities (Aminu, 2023).

## III. METHODOLOGY

### Research Design

This study employed a quantitative, cross-sectional survey design. This approach was deemed appropriate given the study's aim of examining relationships between discrete variables digital literacy, employee motivation, employee performance, and ICT access across a large civil service population. The target population comprised 168,029 civil servants across ministries in Ondo

State. Applying Taro Yamane's (1964) sample size formula at a 0.05 significance level yielded a required sample of approximately 399, rounded to 400. A total of 395 usable questionnaires were returned, representing a response rate of 98.8%.

**Data Collection Instrument**

A structured questionnaire was the primary data collection instrument, comprising three sections: (i) respondent bio-data, (ii) digital governance benefits, and (iii) factors affecting worker productivity. Responses to substantive items were captured on a five-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). Cronbach's Alpha reliability coefficient was 0.80, confirming acceptable internal consistency.

**Data Analysis**

Descriptive statistics (frequencies, percentages) were used to summarize demographic and ICT usage data. Chi-square ( $\chi^2$ ) tests of independence were applied to test each of the three hypotheses at a 0.05 significance level.

**IV. DATA PRESENTATION AND DISCUSSION**

**Descriptive Statistics**

**Table 1: Gender Distribution of Respondents**

Gender	Frequency	Percent	Cumulative Percent
Male	143	36.2%	36.2%
Female	252	63.8%	100.0%
Total	395	100.0%	

The sample comprised 36.2% male and 63.8% female respondents, reflecting the predominantly female workforce in administrative roles within Ondo State ministries.

**Table 2: Age Distribution of Respondents**

Age Group	Frequency	Percent	Cumulative Percent
20–25 years	49	12.4%	12.4%
26–29 years	85	21.5%	33.9%
30–34 years	116	29.4%	63.3%
35 years &	145	36.7%	100.0%

above			
Total	395	100.0%	

The majority of respondents (36.7%) were aged 35 and above, with 29.4% in the 30–34 age bracket. This distribution indicates a predominantly experienced workforce with likely moderate-to-high digital familiarity.

**Table 3: ICT Applications Used by Respondents**

ICT Application	Frequency	Percent	Cumulative Percent
E-mail	124	31.4%	31.4%
Internet	171	43.3%	74.7%
Video Conferencing	100	25.3%	100.0%
Total	395	100.0%	

Internet use was the most prevalent ICT application (43.3%), followed by email (31.4%) and video conferencing (25.3%), indicating a reasonable baseline of digital tool adoption among civil servants.

**Table 4: Educational Qualification of Respondents**

Qualification	Frequency	Percent	Cumulative Percent
ND/NCE	103	26.1%	26.1%
HND/BSc	114	28.9%	54.9%
Post-Graduate	178	45.1%	100.0%
Total	395	100.0%	

The majority of respondents (45.1%) held post-graduate qualifications, suggesting relatively high educational attainment a factor expected to correlate with digital literacy levels.

**Table 5: Ministry/Department of Respondents**

Ministry/Department	Frequency	Percent	Cumulative Percent
Finance & Economic Planning	78	19.7%	19.7%
Health	204	51.6%	71.4%
Agriculture & Natural Resources	82	20.8%	92.2%
Education	31	7.8%	100.0%

Total	395	100.0%
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The Ministry of Health contributed the largest share of respondents (51.6%), reflecting its size and digital infrastructure investments as a frontline service ministry.

**Hypothesis Testing**

Hypothesis 1: Digital Literacy and Employee Motivation

Table 6: Cross-Tabulation Digital Literacy × Employee Motivation

Digital Literacy	SD	D	U	A	SA	Total
SD	4	10	0	0	0	14
D	0	24	20	0	0	44
U	0	1	3	16	0	20
A	6	0	1	142	0	149
SA	0	0	0	10	158	168
Total	10	35	24	168	158	395

Table 7: Chi-Square Tests — Hypothesis 1

Test	Value	df	Sig. (2-sided)
Pearson Chi-Square	766.908	16	.000
Likelihood Ratio	714.476	16	.000
Linear-by-Linear	304.794	1	.000
N of Valid Cases	395		

The Pearson Chi-Square value of 766.908 (df = 16, p < .05) substantially exceeded the critical value of 26.30. The null hypothesis H01 is therefore rejected. There is a significant positive relationship between digital literacy and employee motivation among civil servants in Ondo State.

Hypothesis 2: Digital Literacy and Employee Performance

Table 8: Cross-Tabulation — Digital Literacy × Employee Performance

Digital Literacy	SD	D	U	A	SA	Total
SD	13	1	0	0	0	14
D	4	39	1	0	0	44

U	0	16	3	1	0	20
A	1	10	32	106	0	149
SA	0	0	0	133	35	168
Total	18	66	36	240	35	395

Table 9: Chi-Square Tests — Hypothesis 2

Test	Value	df	Sig. (2-sided)
Pearson Chi-Square	626.334	16	.000
Likelihood Ratio	454.145	16	.000
Linear-by-Linear	290.032	1	.000
N of Valid Cases	395		

The Pearson Chi-Square of 626.334 (df = 16, p < .05) far exceeds the critical threshold of 26.30. H02 is rejected. Digital literacy has a significant and positive influence on employee performance in the Ondo State Civil Service.

Hypothesis 3: ICT Access as Moderator

Table 10: Cross-Tabulation — Digital Literacy × ICT Moderates

Digital Literacy	SD	D	U	A	SA	Total
SD	12	2	0	0	0	14
D	6	38	0	0	0	44
U	0	18	0	2	0	20
A	1	12	32	104	0	149
SA	0	0	0	132	36	168
Total	19	70	32	238	36	395

Table 11: Chi-Square Tests — Hypothesis 3

Test	Value	df	Sig. (2-sided)
Pearson Chi-Square	582.066	16	.000
Likelihood Ratio	454.206	16	.000
Linear-by-Linear	286.674	1	.000
N of Valid Cases	395		

A Chi-Square of 582.066 (df = 16, p < .05) confirms that access to ICT significantly moderates the relationship between digital literacy and employee productivity. H03 is rejected. ICT infrastructure acts

as an enabling condition for translating digital literacy into productivity gains.

#### Discussion of Findings

The findings of this study reveal a compelling and statistically robust picture of how digital literacy and ICT access shape employee productivity within the Ondo State Civil Service. Each of the three hypotheses tested produced significant results, warranting a detailed discussion in relation to existing theory and empirical literature.

#### Digital Literacy and Employee Motivation

The rejection of H01 confirms that digital literacy exerts a significant positive influence on employee motivation among civil servants in Ondo State. The Pearson Chi-Square value of 766.908 ( $p < .05$ ), the highest of the three test statistics recorded in this study, signals a particularly strong association between these two variables. An examination of the cross-tabulation in Table 6 further reinforces this finding: respondents who agreed or strongly agreed with measures of digital literacy were overwhelmingly concentrated in the agree and strongly agree categories for employee motivation, with 142 and 158 respondents respectively, while disagreement responses clustered predictably among those with lower digital literacy ratings.

This finding aligns with Herzberg's Two-Factor Theory (1964), which holds that motivators tied to the nature of work itself including competence, achievement, and a sense of progress are the primary drivers of job satisfaction. When civil servants acquire digital competencies and are equipped with functional digital tools, they experience a heightened sense of accomplishment and control over their work tasks, which in turn fuels intrinsic motivation. The digital work environment thus functions not merely as a procedural upgrade but as a motivational catalyst. This outcome is further consistent with Porter and Lawler's Motivation-Performance Model (1968), wherein an employee's perception of their own abilities in this case, digital skills mediates the effort they invest and, by extension, the motivation they sustain.

Empirically, this finding corroborates the work of Mark and Nzulwa (2018), who demonstrated that digitally enabled career development programs

accounted for a significant proportion of performance motivation variance in the NHIF, and Kemboi (2024), who found that ICT-supported mentorship programs strengthened employee engagement and retention at the Kenya Post Office Savings Bank. In the Nigerian context specifically, Ahmed (2020) observed that digital governance reforms have disrupted rigid bureaucratic hierarchies, creating flatter, more responsive organizational environments that foster greater employee autonomy and, consequently, motivation.

#### Digital Literacy and Employee Performance

The rejection of H02, supported by a Chi-Square value of 626.334 ( $p < .05$ ), establishes that digital literacy has a significant and positive influence on employee performance in the Ondo State Civil Service. Table 8 presents a discernible diagonal pattern in the cross-tabulation, where higher levels of digital literacy consistently correspond to higher performance ratings. Notably, among respondents who strongly agreed with digital literacy indicators, 133 out of 168 reported agreement with performance measures, pointing to a near-unidirectional relationship between these variables.

This finding is theoretically grounded in Porter and Lawler's (1968) contention that an employee's skills and role perception are critical determinants of effective performance. Digital literacy, in this framework, constitutes a core skill set that enables civil servants to process information more efficiently, execute tasks with greater accuracy, and engage more meaningfully with service delivery mandates. When employees are digitally competent, they can navigate e-governance platforms, manage electronic records, and process service requests at a pace and accuracy that manual systems cannot support outcomes that translate directly into measurable performance improvements.

These results resonate with the broader empirical literature. Ragazou et al. (2022), in their comprehensive post-pandemic review of 765 organizational studies, documented measurable productivity gains attributable to the integration of digital technologies including artificial intelligence, big data, and cloud computing across diverse organizational settings. In the Nigerian public sector

specifically, Aliyu (2020) identified reduced revenue leakages, enhanced communication efficiency, and simplified record management as concrete performance benefits arising from digital adoption. The present finding thus affirms that these gains are not abstract or sector-specific but are replicable within state-level civil service institutions such as those in Ondo State, provided that digital literacy levels are sufficiently developed.

#### ICT Access as a Moderator Between Digital Literacy and Employee Productivity

The rejection of H03, confirmed by a Chi-Square value of 582.066 ( $p < .05$ ), demonstrates that access to ICT infrastructure significantly moderates the relationship between digital literacy and employee productivity. This finding carries perhaps the most consequential policy implications of the three. The cross-tabulation in Table 10 mirrors the pattern observed in earlier tables, with high digital literacy respondents strongly endorsing the moderating role of ICT access — 132 out of 168 strongly agreeing respondents aligned in this direction.

This result underscores a fundamental condition of digital transformation: digital literacy, however well developed at the individual level, cannot translate into productivity gains in an environment where ICT infrastructure is absent, unreliable, or inaccessible. The moderating role of ICT access means that its presence amplifies the positive effect of digital literacy on productivity, while its absence effectively neutralizes that effect regardless of employee capability. This is consistent with Herzberg's hygiene factor framework, wherein environmental and structural conditions analogous to ICT access in this context must be adequately met before motivational or performance-enhancing factors can take effect.

This finding is particularly salient given the documented infrastructure challenges in Nigeria's public sector. Aminu (2023) identified ICT infrastructure deficits, digital literacy gaps, and cybersecurity vulnerabilities as the primary constraints on digital governance effectiveness in Nigeria. The present study extends this understanding by empirically demonstrating that infrastructure access is not merely a background condition but a statistically significant moderating variable that

shapes the degree to which digital literacy converts into employee productivity. It reinforces the argument that investments in digital skills training will yield diminishing returns unless accompanied by commensurate investments in reliable ICT infrastructure including broadband connectivity, computer hardware, software platforms, and technical support systems within Ondo State ministries.

Taken together, these three findings present a coherent and mutually reinforcing narrative: digital literacy drives both motivation and performance, but its full productive potential is contingent on the presence of enabling ICT infrastructure. This integrated understanding offers a strong evidential basis for both theoretical refinement and practical intervention in the Ondo State Civil Service and, by extension, other comparable public sector contexts across Nigeria.

## V. CONCLUSION, AND RECOMMENDATIONS

### Conclusion

This study set out to investigate the effect of Digital Human Resource Management Systems (DHRMS) on employee productivity in the Ondo State Civil Service, with specific focus on three pathways: the influence of digital literacy on employee motivation, the influence of digital literacy on employee performance, and the moderating role of ICT access on the relationship between digital literacy and employee productivity. Drawing on a quantitative cross-sectional survey of 395 civil servants across four ministries, and anchored theoretically in Herzberg's Two-Factor Theory and Porter and Lawler's Motivation-Performance Model, the study produced statistically significant findings across all three hypotheses tested.

The evidence is unambiguous: digital literacy is a meaningful and measurable driver of both motivation and performance among civil servants in Ondo State. Civil servants who possess higher levels of digital competency demonstrate greater engagement with their work, perform assigned tasks more efficiently, and contribute more effectively to public service delivery outcomes. These relationships are not incidental but are consistent with well-established motivational theory and corroborated by a substantial

body of empirical literature spanning the African continent and beyond.

Equally significant is the finding that ICT access moderates the relationship between digital literacy and productivity. This establishes that the productive value of digital skills is not self-sufficient it is conditional on the availability of functional, reliable, and accessible technological infrastructure. In practical terms, this means that human capital investment in digital literacy, while necessary, is insufficient on its own. It must be paired with institutional investment in ICT infrastructure if it is to yield the productivity improvements that digital transformation promises.

The broader implication of these findings extends beyond Ondo State. Across Nigeria and much of sub-Saharan Africa, public sector institutions continue to grapple with the dual challenge of building digital capability among their workforce while simultaneously deploying and maintaining the infrastructure required to make that capability productive. This study contributes empirical evidence to that conversation, demonstrating that both dimensions of the challenge are real, measurable, and consequential. It affirms that the Nigerian public sector's digital transformation agenda, as envisioned in frameworks such as the African Union's Digital Transformation Strategy for Africa 2020–2030, is achievable but only through sustained, coordinated, and adequately resourced effort at the institutional and policy levels.

In sum, this study concludes that Digital Human Resource Management Systems, when underpinned by genuine digital literacy among employees and supported by adequate ICT infrastructure, have the capacity to significantly improve employee productivity in the Ondo State Civil Service. The findings therefore call for deliberate, evidence-based policy action to accelerate digital capacity building and infrastructure development as twin pillars of public sector reform in Ondo State and Nigeria at large.

#### Recommendations

On the basis of the foregoing findings and conclusions, the following recommendations are advanced for policymakers, civil service

administrators, and relevant stakeholders in Ondo State and the broader Nigerian public sector:

- i. Given the strong positive relationship established between digital literacy and both employee motivation and performance, the Ondo State government should institutionalize mandatory, structured digital literacy training as a core component of civil service capacity development. Such programmes should be tiered to reflect varying levels of existing competency providing foundational training for employees with limited digital exposure while offering advanced modules for those in technically demanding roles. Training content should be practical and role-specific, equipping civil servants with the precise digital skills required to perform their assigned functions efficiently. The Office of the Head of Service should coordinate this effort in partnership with relevant tertiary institutions and technology training organizations, and training outcomes should be formally assessed and documented as part of each employee's performance appraisal record.
- ii. The finding that ICT access significantly moderates the digital literacy-productivity relationship carries a direct investment imperative. The Ondo State government should allocate dedicated budgetary provisions for the procurement, maintenance, and periodic upgrading of ICT infrastructure across all ministries and departments. Priority attention should be given to ensuring stable broadband internet connectivity, sufficient computer hardware, functional intranet systems, and licensed productivity software in every ministry. Ministries with currently limited infrastructure particularly those outside the frontline service ministries reflected in this study's sample should be brought to a minimum operational standard as a matter of urgency. Without this foundational infrastructure, digital literacy investments will remain unable to generate their full productive returns.
- iii. To provide strategic coherence to digital reform efforts, the Ondo State government should develop and formally adopt a comprehensive Digital Transformation Policy Framework for the civil service. This framework should articulate clear targets for digital literacy attainment, ICT

infrastructure deployment, e-governance system adoption, and digital HR management, with defined timelines and accountability mechanisms. It should align with the African Union's Digital Transformation Strategy for Africa 2020–2030 and Nigeria's national e-governance agenda, ensuring that state-level efforts are consistent with and complementary to broader continental and national commitments. A dedicated implementation unit within the state's Ministry of Finance and Economic Planning or the Office of Transformation should be empowered to coordinate, monitor, and report on progress against this framework.

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