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DIGITALIZATION OF WORK PRACTICES AND ITS IMPACT ON EMPLOYEE ENGAGEMENT IN NIGERIA'S MANUFACTURING SECTOR

MARY SHADRACH OMOFOWA
Department of Human Resource,
Faculty of Management Sciences,
University of Benin
mary.omofowa@uniben.edu
Tel: 08034308512
ORCID:0000-0002-7186-7977

OFAMEN OGBONMWAN
Department of Human Resource,
Faculty of Management Sciences,
University of Benin
ofamen.ogbonmwan@uniben.edu
Tel: 08130450605

ABSTRACT
Digital transformation is reshaping workplaces globally, offering opportunities to enhance employee engagement while introducing challenges such as techno-stress and job insecurity. This study investigates the impact of work practice digitalization on employee engagement in Nigeria's manufacturing sector, focusing on Edo State. Using a cross-sectional survey of 300 employees from three major firms (Guinness Nigeria Plc, Nigeria Bottling Company, and 7Up Bottling Company), the study examines the effects of digital productivity processes, decent work, job satisfaction, and technology-based job autonomy. Data were analyzed using descriptive statistics, correlation, multiple regression, and confirmatory factor analysis. Results indicate significant positive effects of digital productivity processes, decent work, job satisfaction, and job autonomy on engagement. Grounded in the Job Demands-Resources (JD-R) model, the findings highlight digitalization's dual role as a resource and challenge. Recommendations include up skilling programs, supportive leadership, and robust digital infrastructure to sustain engagement. The study contributes to understanding digital transformation in developing economies and offers policy insights for fostering competitive, engaged workforces in Nigeria's manufacturing sector.

Keywords: Digital Transformation, Employee Engagement, Decent Work, Job Satisfaction, Job Autonomy, Manufacturing Sector, Nigeria

INTRODUCTION
The rapid adoption of digital technologies is transforming workplaces globally, enhancing operational efficiency, flexibility, and employee engagement (Kraus

et al., 2021). In Nigeria's manufacturing sector, digitalization is critical for maintaining competitiveness amid global economic pressures, particularly in Edo State, a commercial hub in the south-south region. Firms such as Guinness Nigeria Plc and Nigeria Bottling Company are increasingly integrating digital tools like automation and cloud computing to optimize production processes (Elekwachi, 2024). Employee engagement, defined as a positive, work-related state of vigor, dedication, and absorption (Schaufeli et al., 2002), is essential for organizational success, driving productivity, innovation, and retention. However, digitalization introduces both opportunities, such as enhanced autonomy and efficiency, and challenges, including technostress and perceived job insecurity (Wang & Liu, 2023). Despite growing scholarly interest, empirical studies on how digitalization influences engagement in developing economies like Nigeria remain limited, particularly in the manufacturing sector.

Problem Statement

The practical problem lies in the limited understanding of how digitalization impacts employee engagement in Nigeria's manufacturing sector, where firms face challenges in balancing technological adoption with workforce well-being. Many organizations struggle with technostress, skill gaps, and resistance to change, which can undermine engagement and productivity (Davenport & Ronanki, 2018; Kane et al., 2015). Without evidence-based strategies, firms risk disengagement, reduced competitiveness, and failure to leverage digital tools effectively. Theoretically, while the Job Demands-Resources (JD-R) model provides a framework for understanding workplace dynamics (Bakker & Demerouti, 2018), its application to digitalized work environments in developing economies is underexplored. Existing studies often focus on operational outcomes or stress responses, neglecting the interplay of digital productivity processes, decent work, job satisfaction, and autonomy in fostering engagement (Wang & Liu, 2023; Nyabuudzi & Chinyamurindi, 2024). This study addresses these gaps by empirically examining how digitalization influences engagement in Edo State's manufacturing sector, offering practical insights for organizations and theoretical contributions to the JD-R model in a digital context.

Research Questions

1. To what extent does the digital productivity process affect employee engagement?
2. Is there a relationship between decent work and employee engagement?
3. What is the relationship between job satisfaction and employee engagement?

4. Does technology-based job autonomy affect employee engagement?

Objectives of the study

The primary objective is to assess the impact of work practice digitalization on employee engagement in Edo State's manufacturing sector. Specific objectives include:

1. Exploring the effect of digital productivity processes on engagement.
2. Evaluating the influence of decent work on engagement.
3. Investigating the role of job satisfaction in engagement.
4. Examining the impact of technology-based job autonomy on engagement.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Digitalization transforms organizational processes by integrating automation, data-driven operations, and communication platforms, fundamentally reshaping work practices and employee experiences (Vial, 2019). Unlike digitization, which converts analog to digital formats, digitalization involves socio-technical changes that affect job roles, skill requirements, and organizational culture (Kraus et al., 2021). In manufacturing, digital tools enhance efficiency but introduce challenges like techno-stress and skill gaps (Davenport & Ronanki, 2018).

Digital Productivity Process

Digital productivity processes involve the use of AI, workflow automation, and cloud computing to streamline tasks and enhance collaboration (Westerman et al., 2014). These processes empower employees by reducing repetitive tasks and enabling real-time coordination, which can boost engagement (Chen & Chen, 2023). However, challenges such as tool overload and resistance to change may hinder engagement (Kane et al., 2015). Studies in other sectors confirm a positive link between digital productivity and engagement (Elekwachi, 2024; Widodo et al., 2024).

H1: Digital productivity processes positively impact employee engagement.

Decent Work

Decent work, encompassing fair income, job security, and opportunities for personal development (International Labour Organization, 1999), is a cornerstone of employee engagement. Digitalization can support decent work by providing access to learning resources and flexible arrangements (Chesley, 2014). However, automation may threaten job security if reskilling is inadequate (De Stefano, 2016). Research shows decent work fosters engagement by meeting

psychological needs for dignity and growth (Duffy et al., 2020; Blustein et al., 2023).

H2: Decent work positively impacts employee engagement.

Job Satisfaction

Job satisfaction, reflecting contentment with work roles and conditions, is a key driver of engagement (Hackman & Oldham, 1976). Digital tools enhance satisfaction by improving efficiency and flexibility, but excessive monitoring can increase stress and reduce engagement (Bhave, 2014). Empirical studies suggest job satisfaction positively influences engagement, particularly in technology-enabled settings (Gajendran & Harrison, 2007).

H3: Job satisfaction positively impacts employee engagement.

Technology-Based Job Autonomy

Technology-based job autonomy, enabled by digital platforms like collaboration software and AI, allows employees to self-manage tasks and schedules (Mazmanian et al., 2013). This autonomy fosters responsibility, innovation, and engagement (Ma et al., 2023). However, poorly managed autonomy may lead to isolation or blurred work-life boundaries (Day et al., 2012). Studies in Nigeria highlight autonomy's positive impact on engagement in digitalized workplaces (Mahlasela & Chinyamurindi, 2020).

H4: Technology-based job autonomy positively impacts employee engagement.

METHODS

This study employed a descriptive, cross-sectional survey design to examine the relationship between digitalization and employee engagement. This design is suitable for capturing contemporary workplace phenomena at a single point in time, allowing for efficient data collection and analysis (Creswell, 2018). The study population comprised 1,860 employees from three major manufacturing firms in Edo State, Nigeria: Guinness Nigeria Plc, Nigeria Bottling Company, and 7Up Bottling Company. These firms were selected for their prominence and adoption of digital technologies in production processes. The sample included employees aged 18 years or older with at least a high school education, drawn from production, accounting, customer service, and personnel departments to ensure diverse perspectives.

Convenience sampling was used due to practical constraints in obtaining a comprehensive employee list across multiple firms (Saunders et al., 2009). The sample size was determined using the Taro Yamane (1964) formula, yielding a

sample size of 329. After excluding 29 invalid or incomplete responses (10 improperly filled, 19 not returned), the final sample was 300 respondents (54.2% female, 47.8% male).

The study adapted the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007) to examine employee engagement as the dependent variable, with digital productivity process, decent work, job satisfaction, and technology-based job autonomy as independent variables. Control variables included age, gender, education, and tenure. The econometric model is specified as:

$$EE_u = \beta_0 + \beta_1 WD_u + \beta_2 PP_u + \beta_3 DW_u + \beta_4 JS_u + \beta_5 JA_u + \mathbf{e}$$

Where:

EE_u:	=	Employees engagement for employee (i) at time (t)
WD_u:	=	Workplace digitalization
PP_u:	=	Digitalized production progress
DW_u:	=	Perceived decent work condition
JS_u:	=	Job satisfaction
JA_u:	=	Job autonomy
e	=	Error term

Variables Measurement

Primary data were collected via questionnaires distributed through human resource departments, with confidentiality assured to minimize bias (Podsakoff et al., 2003). Constructs were measured on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) using validated scales:

Digital Productivity Process: Adapted from Syed and Jamal (2012), focusing on operational efficiency, AI, and change management (Cronbach's α = 0.78).

Decent Work: Based on Duffy et al. (2016), assessing fair income, job security, and growth opportunities (Cronbach's α = 0.74).

Job Satisfaction: Measured using the Minnesota Satisfaction Questionnaire (Weiss & Kalleberg, 2010) (Cronbach's α = 0.77).

Technology-Based Job Autonomy: Adapted from Spreitzer (1995), evaluating task discretion via digital tools (Cronbach's α = 0.73).

Employee Engagement: Measured using the Utrecht Work Engagement Scale (Schaufeli et al., 2002), assessing vigor, dedication, and absorption (Cronbach's α = 0.88).

Data were analyzed using Stata 13.0, with reliability confirmed via Cronbach's alpha (0.73-0.88), Kaiser-Meyer-Olkin (KMO; 0.72–0.83), and Bartlett's sphericity tests ($p < 0.01$).

RESULTS

Descriptive statistics revealed a balanced sample (54.2% female, 47.8% male, mean age = 34.5 years, SD = 6.2). Reliability tests confirmed strong internal consistency (Cronbach's α = 0.73–0.88), with KMO values (0.72–0.83) and Bartlett's sphericity tests ($p < 0.001$) indicating sampling adequacy. Variance Inflation Factor (VIF < 10) confirmed no multicollinearity, and Breusch-Pagan ($p = 0.1011$) and Ramsey Reset ($p = 0.1460$) tests indicated no heteroskedasticity or omitted variable bias.

Table 1: Multiple Regression

EENG	Coef.	Std. Err.	T	P>|t|	[95% Conf.	Interval]
DPRP	.1574	.0382	4.12	0.00	.0821	.2326
PDWC	.2401	.0351	6.83	0.000	.1709	.3092
JSAT	.227651	.0493	4.62	0.000	.1306	.3246
JAUT	.117148	.0425	2.76	0.006	0.336	.2007
_cons	1.1836	.1909	6.20	0.000	.8079	1.5593
Prob > F	0.0000					
R-squared	0.4654					

Source: Authors computations, 2025

Multiple regression analysis showed Digital Productivity Process positively impacts engagement ($\beta = 0.157$, $p = 0.001$), supporting H1. Decent Work positively impacts engagement ($\beta = 0.240$, $p = 0.005$), supporting H2. Job satisfaction positively impacts engagement ($\beta = 0.227$, $p = 0.005$), supporting H3. Similarly, job autonomy positively impacts engagement ($\beta = 0.117$, $p = 0.005$), supporting H4.

The model's R-squared (0.47) indicates moderate explanatory power, explaining 59% of the variance in employee engagement. Confirmatory factor analysis validated the measurement model, confirming convergent and discriminant validity.

DISCUSSION

The findings align with the JD-R model, which posits that job resources enhance engagement while demands may hinder it (Bakker & Demerouti, 2018). Digital productivity processes improve efficiency and collaboration, empowering

employees and boosting engagement (Elekwachi, 2024; Widodo et al., 2024). Decent work conditions, such as fair wages and job security, foster engagement by fulfilling psychological needs for dignity and growth (Duffy et al., 2020; Blustein et al., 2023). Job satisfaction, driven by meaningful work and digital efficiency, enhances engagement, particularly in flexible work environments (Gajendran & Harrison, 2007). Technology-based job autonomy promotes responsibility and innovation, further supporting engagement (Ma et al., 2023; Mahlasela & Chinyamurindi, 2020). However, challenges like technostress and skill gaps necessitate strategic interventions, such as upskilling programs and balanced monitoring, to sustain engagement (Wang & Liu, 2023). The study's focus on Nigeria's manufacturing sector highlights the applicability of the JD-R model in developing economies, addressing a critical theoretical gap.

CONCLUSION

This study demonstrates that digitalization of work practices significantly enhances employee engagement in Nigeria's manufacturing sector by improving digital productivity processes, decent work conditions, job satisfaction, and technology-based job autonomy. The JD-R model provides a robust framework for understanding how digital tools act as job resources to foster engagement while highlighting the need to mitigate demands like technostress and skill gaps. These findings underscore the importance of strategic digital integration to create engaged, productive workforces in developing economies, particularly in Edo State's manufacturing sector.

RECOMMENDATIONS

1. Up skilling Programs: Implement digital literacy training to enhance employee competence and reduce technostress (Laoye, 2023).
2. Supportive Leadership: Foster transformational leadership to guide employees through digital transitions, boosting confidence and engagement (Kraus et al., 2021).
3. Digital Infrastructure: Invest in reliable internet and power supply to support seamless technology adoption (Giz, 2025).
4. Balanced Autonomy: Develop policies ensuring autonomy while maintaining work-life boundaries to prevent isolation (Day et al., 2012).

5. Participatory Decision-Making: Encourage employee involvement in digital transformation processes to enhance ownership and engagement (Heeks et al., 2020).

Policy Implications

The findings have significant implications for Nigeria's manufacturing sector, emphasizing the need for policies that enhance digital infrastructure, reduce technology adoption costs, and promote workforce engagement. Collaboration with the Manufacturers Association of Nigeria (MAN) can support initiatives such as tax incentives for digital investments, public-private partnerships to improve internet and power reliability, and funding for upskilling programs. These policies can create efficient, connected workplaces that enhance engagement, competitiveness, and sustainable industrial growth. Additionally, labor policies should prioritize decent work standards, including fair wages and job security, to mitigate automation-related concerns and foster a culture of continuous learning and innovation.

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