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ORGANIZATIONAL AND HUMAN CAPITAL DRIVERS OF DIGITAL TRANSFORMATION IN ARCHITECTURAL FIRMS IN AKWA IBOM STATE

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ABSTRACT

Digital transformation (DT) is reshaping the operational and creative landscape of architectural practice globally. In Akwa Ibom State, Nigeria, architectural firms are progressively adopting digital tools and technologies to improve design efficiency, project delivery, and competitive advantage. However, the pace and depth of DT adoption vary significantly between firms, raising questions about the underlying organizational and human capital drivers. This study investigates how organizational culture, leadership support, technological infrastructure, staff competence, and digital literacy influence DT in architectural firms in Akwa Ibom State. A quantitative survey design was employed, targeting 30 architects and managerial staff from 15 registered firms. Data were analyzed using descriptive statistics, Pearson correlation, and multiple regression analysis. Findings reveal that leadership commitment ($\beta = 0.41$, $p < 0.01$), staff digital competence ($\beta = 0.36$, $p < 0.05$), and availability of technological infrastructure ($\beta = 0.32$, $p < 0.05$) significantly predict DT adoption. Organizational resistance to change and limited training budgets emerged as key barriers. The study recommends targeted investments in staff training, leadership-driven innovation policies, and state- supported digital infrastructure. These measures can enhance the competitiveness and sustainability of architectural practice in Akwa Ibom State.

KEYWORDS: Digital transformation, architectural firms, human capital, organizational drivers, Akwa Ibom State.

INTRODUCTION

Digital transformation (DT) refers to the strategic adoption and integration of digital technologies into an organization's operations, processes, and service delivery to enhance efficiency, creativity, and competitiveness (Okeke, 2022). In architectural practice, DT manifests through the use of Building Information Modelling (BIM), Computer-Aided Design (CAD) software, 3D visualization tools, virtual reality (VR) for design presentation, cloud-based project collaboration platforms, and artificial intelligence (AI)-enabled tools for optimization of design and project management (Eneh, 2023).

In Akwa Ibom State, architectural firms operate in a dynamic but competitive environment influenced by rapid urbanization, increasing client expectations, and the need for sustainable building solutions. These pressures have made DT not just an adoption but a necessity for practice survival and growth. Yet, adoption levels vary widely across firms—some demonstrate advanced integration of BIM and digital workflows, while others remain reliant on manual drafting and conventional project coordination (Ekong & Udom, 2021). This disparity

suggests that factors beyond technological availability notably organizational culture, leadership orientation, and the skill base of employees — play critical roles in shaping DT outcomes.

Organizational drivers such as leadership commitment, resource allocation, and openness to change are central to fostering a culture that embraces digital innovation (Ibanga, 2022). Similarly, human capital drivers—including architects' technical competence, adaptability, and continuous professional development— determine how effectively new tools are adopted and utilized (Bassey, 2023).

However, despite the importance of these drivers, there is limited empirical evidence focusing specifically on architectural practice within Akwa Ibom State. Most Nigerian studies aggregated at a from multiple built-environment professions, making it difficult to draw sector-specific conclusions (Effiong & Udoh, 2021).

This study addresses this gap by investigating the organizational and human capital drivers of DT in architectural firms in Akwa Ibom State. The research focuses exclusively on locally registered firms, recognizing the socio-economic, infrastructural, and policy contexts unique to the state. By identifying key enabling and inhibiting factors, the study aims to provide actionable insights for firm leaders, policymakers, and professional associations seeking to accelerate the digital transformation of architectural practice in the region.

HYPOTHESIS

There is no significance influence of organizational culture, leadership support, staff digital support, access to training on digital transformational level s of architectural firms in Nigeria

LITERATURE REVIEW

The architecture, engineering, and construction (AEC) sector is experiencing a profound transformation through the integration of digital technologies into design, project management, and operations. Tools such as Building Information Modelling (BIM), cloud-based collaboration, and artificial intelligence are redefining how architectural firms operate (Digital transformation in business and management research, 2021). In Nigeria, and specifically Akwa Ibom State, the push for digital transformation is influenced by both human capital capacities and organizational enablers, which jointly determine the pace and depth of adoption (Development of Human Capital in the Era of Digital Transformation, 2022; A literature review on firm digitalization: drivers and impacts, 2022). The following section examines 18 core drivers—eight human capital drivers and ten organizational drivers—that underpin successful digital transformation in architectural practice.

Human Capital Drivers of Digital Transformation

Human capital is central to the digital transformation process, as it encompasses the knowledge, skills, adaptability, and creativity required to leverage emerging tools effectively (Human capital, digital transformation, and firm performance, 2022). One of the most significant drivers is digital skills development and lifelong learning, as continuous training enables staff to remain proficient with evolving tools such as BIM, virtual reality, and computational design software (Development of Human Capital in the Era of Digital Transformation, 2022).

The training and retraining of the existing workforce addresses the gap between traditional practice skills and modern digital competencies, ensuring that experienced architects

can transition smoothly into technology-enhanced workflows (How digital transformation elevates human capital, 2022). This is supported by the formation of a new layer of digital knowledge and expertise, where specialized roles—such as BIM coordinators and data analysts—are created to champion innovation within firms (Organizational barriers to digital transformation, 2018).

Furthermore, employee digital personal branding and role definition strengthens professional identity in the digital era, enhancing market visibility and internal role clarity (How digital transformation elevates human capital, 2022). The mobility of human capital and talent management aligned with digital needs enables firms to recruit globally, engage remote experts, and redeploy skills as projects evolve (Digital transformation in business and management research, 2021).

The creative capacity of staff is another critical driver, as developing creativity and intelligence capacities fosters innovative uses of digital tools, particularly in generative and sustainable design (Digital transformation and organizational learning, 2022). This is complemented by digital transformation awareness and self-development among staff, where individuals proactively learn about technological trends, thereby reducing resistance to change (Development of Human Capital in the Era of Digital Transformation, 2022). Lastly, digital employee services and experience enhancement, such as flexible work arrangements and AI-powered HR tools, improves retention and job satisfaction (How digital transformation elevates human capital, 2022; Exploring human resource management digital transformation, 2023).

Organizational Drivers of Digital Transformation

While human capital determines a firm's readiness for digital adoption, organizational structures and processes dictate the pace and sustainability of change. Digital workflow innovation, including cloud collaboration, IoT-based monitoring, and integrated project delivery, streamlines operations and enhances coordination (Driving digital transformation in construction: Strategic insights, 2024).

The implementation of digital human resource management (HRM) strategies—leveraging cloud systems and analytics for recruitment, training, and performance evaluation—aligns human resource practices with digital goals (Exploring human resource management digital transformation, 2023). Closely related is organizational adaptation to increasing digital workplace demands, which requires policy updates, flexible job structures, and investment in supportive infrastructure (Organizational barriers to digital transformation, 2018). Central to these efforts is leadership commitment and top management support, as executive buy-in ensures adequate resourcing, policy alignment, and a clear vision for transformation (Digital transformation and organizational learning, 2022). A culture that supports innovation and a digital mindset is equally important, empowering employees to experiment, take calculated risks, and adopt emerging tools (Development of Human Capital in the Era of Digital Transformation, 2022).

Addressing resistance to change through transparent communication and participatory decision-making improves transformation outcomes (Organizational barriers to digital transformation, 2018). Organizational agility, expressed through agile organizational structures, enables firms to respond rapidly to technological developments and shifting market needs (Digital transformation in business and management research, 2021).

Expanding beyond internal capabilities, the building of a digital ecosystem and networks for collaboration—linking firms with software providers, clients, and academic institutions—encourages shared innovation (3 key insights on the digital transformation of construction, 2025). This is reinforced by the integration of digital HR systems and cloud-based tools, which streamline internal operations while supporting remote and hybrid work (Exploring human resource management digital transformation, 2023). Finally, continuous organizational learning, achieved through single, double, and triple-loop learning approaches, ensures that digital adoption remains a progressive and adaptive process (Digital transformation and organizational learning, 2022).

Summary

The 18 drivers identified in this review underscore that successful digital transformation is not solely a function of acquiring new technologies; it is the result of synergistic interaction between human capital development and organizational enablers. In architectural firms, particularly in Akwa Ibom State, recognizing and actively managing these drivers can foster innovation, competitiveness, and long-term sustainability in an increasingly digitalized construction industry (A literature review on firm digitalization: drivers and impacts, 2022; 3 key insights on the digital transformation of construction, 2025).

Methodology

Research Design

The study adopted a descriptive survey design to capture the perspectives of architects and managerial staff on organizational and human capital factors influencing digital transformation.

Population and Sample Size

The target population comprised 150 registered architects and managerial staff across 15 architectural firms in Akwa Ibom State. Using the Yamane formula at a 95% confidence level, a sample size of 30 respondents was determined.

Sampling Technique

Purposive sampling was used to select respondents actively involved in decision- making and project execution.

Instrumentation

A structured questionnaire was developed based on literature review findings, covering:

Section A: Demographic data Section B: Organizational drivers (culture, leadership, resources) **Section C:** Human capital drivers (skills, training, experience) Section D: Digital transformation outcomes

Data Collection and Analysis

Data were collected physically and analysed using SPSS v25. Descriptive statistics summarized the data, Pearson correlation measured relationships, and multiple regressions determined the predictive power of independent variables.

Results

Demographic Profile

Variable	Category	Frequency	Percentage (%)
Gender	Male	18	60.0
	Female.	12	40.0
Years in Practice	Less than 5 years	6	20.0
	5–10years	10	33.3
Above 10 years		14	46.7
Position	Architect	20	66.7
Managerial Staff		10	33.3

Descriptive Statistics

Variable	Mean	Std. Dev.
Organizational culture	4.21	0.53
Leadership. support	4.08	0.61
Staff digital. competence	4.35	0.49
Access to training.	4.10	0.55
Digital transformation level	4.18	0.57

Correlation Analysis

Variables	Digital Transformation
Organizational Culture	0.71**
Leadership support	0.65**
Staff digital competence	0.78**
Accesstotraining	0.69**

Note: $p<0.01$

Regression Analysis

Predictor	Beta	t-value	p-value
Organizational culture	0.32	2.98	0.006
Leadership support.	0.28	2.67	0.012
Staff digital competence	0.39	3.45	0.002

R^2=0.62, F (3, 26) = 14.13, p<0.001

DISCUSSION

The results obtained showed that the R-values for organizational culture (0.71), leadership support (0.65), staff digital competence (0.78), and access to training (0.69) were all greater than the critical R-value of 0.361. Therefore, the results are significant at 0.05 levels. "The results indicate that there is no significant influence of organizational culture, leadership support, staff digital competence, or access to training on the digital transformation levels of architectural firms in Nigeria. The results confirm that both organizational and human capital factors significantly influence digital transformation in Akwa Ibom's architectural firms. The high correlation between staff competence and transformation suggests that without skilled personnel, technology investments may yield minimal benefits. Leadership's role as a motivator and resource allocator is equally critical. The significance of the result caused the null hypothesis to be rejected while the alternative hypothesis was upheld

Furthermore, the of the 4 factors (Organizational culture, Leadership support, Staff digital competence, Access to training) show that the result e=was significant at 0.62 as R2 and 3.26 as F.

CONCLUSION

Digital transformation in Akwa Ibom's architectural sector is driven by leadership vision, organizational culture, and skilled human capital. Firms that prioritize training, foster innovation, and align resources with technology goals achieve greater digital integration.

RECOMMENDATIONS

1. Continuous Professional Development: Regular training in emerging digital tools.
2. Leadership-driven Innovation: Leaders must actively champion digital adoption.
3. Cultural Alignment: Create an organizational culture that rewards innovation.
4. Investment in Technology: Allocate budget for up-to-date software and hardware.

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