Does Digital Transformation Impact Staff Productivity? Evidence from Nigeria Manufacturing Sector

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ABSTRACT

This study critically analyses the impact of digital transformation on staff productivity in Nigeria's manufacturing sector. Technology Task Fit theory was used to support the investigation with particular focus on the mono method qualitative research that adhere to interpretivism philosophy, grounded theory strategy and inductive approach for thematic analysis. The findings revealed that Nigeria manufacturing firms have made progress in digitizing processes particularly through ERP system like SAP, robotics and automation technologies, with participants revealing the transformative benefits such as improvement in efficiency, quality, safety, and productivity of staff. The study also found that digital systems over the years has improved staff productivity and that depended on conditions such as availability of power supply and internet connectivity. This implied that strategic implementation of digital transformation, technological integration and adoption with competitive market positioning are required to ensure Nigerian manufacturing firms increase their performance and achieve sustainability. The study concludes that to improve performance, competitive advantage and sustainability, firms should adopt a strategic implementation of digital transformation through a phased and priority-based approach. The study recommends that government at all levels should support the sector through provision of constant power supply and reliable internet infrastructure while firms should ensure there is continuous training and upskilling of staff on digital technologies.

Keywords: Digital transformation, staff productivity, manufacturing sector

INTRODUCTION

Digital transformation (DT) has become central to competitiveness in global manufacturing. An increasing number of companies are using digital technologies to gather real time data, analyse it and give valuable information to the manufacturing system. It also assists manufacturing companies with automation through production scheduling and planning, energy management, flexibility and operational performance (Chukwudi, 2024). Hence, digital technologies are expected to facilitate and enhance productivity, safety, and environmental conditions (Sui et al., 2024). However, companies especially in the manufacturing sector do not know how to take advantage of the benefit of digital technology (Fhrizz, et al., 2024). Contextual challenges such as poor infrastructure, high cost of technology, and skill shortages also continue to limit technology-enabled productivity gains in the manufacturing sector (Omofowa, 2025)

In Nigeria, manufacturers are increasingly adopting digital tools to address inefficiencies, growing competition, and structural constraints, which provides an opportunity for the improvement of the sector performance (Adeyinka, 2023). Recent studies shows that DT improves decision-making, reduces production delays, and enhances employee productivity (Omofowa, 2025). Moreso, as technological advancements have characterised the present dispensation, altering the business landscape, thereby making it crucial for enterprises to improve efficiency, reduce costs and meet changing consumer needs, digital transformation revolutionizes the manufacturing process resulting in operational efficiency and productivity (Voskerichyan & Baiming, 2024).

Digital transformation has affected companies' performance by improving innovation, decision making processes, operational efficiency hence increasing their market positioning and competitiveness (Chukwudi, 2024). Despite the possible benefits digital transformation could provide to Nigeria manufacturing firms, there

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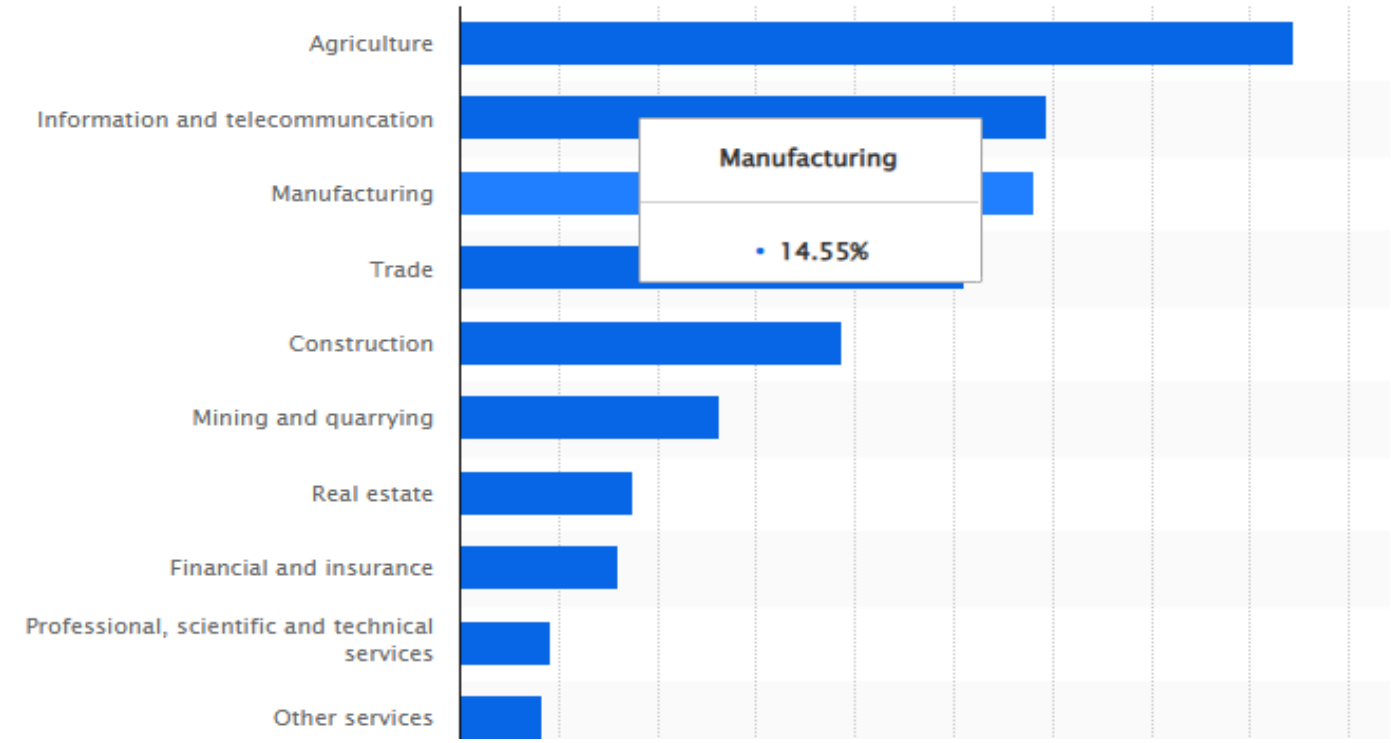
is low utilisation of high-end digital technologies with firms still depending on basic digital tools, and this limited adoption hinders the sector's ability to increase its operational efficiency and compete globally (Adeyinka, 2023; UNIDO, 2020). Shortfall of skilled workers, the use of obsolete methods, inadequate digital infrastructure and poor performance of staff in manufacturing sector continues to hinder productivity (Nzenwata, 2019; Okpala et al., 2021; Sreekumar & Rajnarayanan 2024).

The conversion of physical materials into physical goods using repeatable processes is called manufacturing, which takes place in factories or plants, which are buildings equipped with machines, tools and information's that individuals use to assemble parts or convert materials into products, based on the functional system of human to machine interactions (Björkdahl, 2020). The Nigeria business landscape comprises of different sectors which include agriculture, manufacturing, information and technology, construction, finance, and health. Meanwhile, the manufacturing sector in Nigeria is an important sector owing to its contribution to the Nigeria economy, having contributed 14.55% as shown in figure 1 below to Nigeria GDP in 2023 (Statista, 2025) and employs 12% of the country workforce (National Bureau of Statistics, 2025).



(Source: Statista, 2025)

Figure 1: Nigeria Gross Domestic Product Across Sectors Including Manufacturing In 2023

According to the Nigeria National Bureau of Statistics (2025) there are thirteen industries in the Nigeria manufacturing sector which are oil refining; cement; food, beverage and tobacco; textile, apparel and footwear; wood and wood product; chemical and pharmaceutical products; pulp paper and paper products; plastic and rubber products; electrical and electronic; non-metallic products, basic metal and iron and steel; motor vehicles and assembly; and other manufacturing. The food, beverage and tobacco industries were the largest contributors to the manufacturing sector gross domestic production in 2024 with 4.5%, while cement, textile apparel and footwear industries contributed 0.8% and 1.53% respectively (Statista, 2025).

Major players in the sector include Dangote Group, Unilever Nigeria Plc, Nestle Nigeria Plc, Cadbury Nigeria Plc, Coca Cola Hellenic Bottling Company, Friesland Campina Wamco, Guinness Nigeria Plc, Coleman Wires, GZ Industries Limited, and Wemy Industries, as an estimated ₦32T was contributed by manufacturing companies in Nigeria to the nation economy between 2018 to 2022 (Nariametrics, 2025). However, the barriers in these organisations limit the adoptions of digital transformation in Nigeria enterprises. Thus, this study examined the impact of digital transformation on staff productivity within the Nigeria manufacturing sector, as the sector embrace digital transformation as an approach to improve it productivity.

LITERATURE REVIEW

Conceptualisation

Digital transformation occurs when an organisation uses digital technologies to create or adjust existing processes and business models, to aid the transformation of organisational processes, structures or relationships with internal and external stakeholders (Plekhanov et al., 2023). Equally, Sui et al., (2025) argued that digital transformation is the digital conversion and upgrading conducted by industries. Firms in their quest for further improvements embraces DT as it offers a means for transformational improvements.

Productivity is referred to as a measure of effectiveness and efficiency; hence staff productivity is the time consumed actively by staff on work which require execution and production (Singh et al., 2022). However, Naeem and Ozeum (2021) stated that staff productivity refers to the measure to which the adopting of technology reduces the time and effort necessary to complete a particular work. Staff productivity is task, technology, time and effort dependent.

Fhrizz et al., (2024) in a quantitative correlation research design study conducted in the Philippines argued that readiness of staff for digital transformation due to their level of job satisfaction influences their level of productivity. However, the study did not consider other factors such as the nature of task, and digital technologies as a factor upon which staff productivity could be hinged.

Equally, Happiness, (2024) in a Nigeria study with population sample of 832 staff from 30 manufacturing firms, concluded that there is an important positive relationship between staff productivity and digital transformation in manufacturing firms. Stating that timeliness, efficiency and task accomplishment are measures of staff productivity. However, the suitability of the digital technologies to the task was not considered. Digital technology can only improve productivity when its features align appropriately with what the task requires.

Adeyinka (2023) in a quantitative study posited that Nigerian manufacturing firms' adoption of digital technologies can result in positive transformational effect of efficiency. Although efficiency is needed to enhance productivity, however, productivity depends on technology supporting the specific task being performed and not only on the nature of the firm adopted digital technologies. A digital system that does match task requirements can increase complexity, slow workflows, and introduce errors hampering operational efficiency. Laoye (2023) found from research of manufacturing firms in River's state Nigeria, using a cross-sectional survey design that digital transformation improves employee productivity, however, argued that information and communication technology training for staff will lead to more productivity. Although the training will improve the ICT skills of staff, however, the ICT training may build generic skills, instead of the specific capabilities needed for real work tasks.

Marsh et al., (2022) studied an integrated view covering the use of digital technologies in different fields, and their dark adverse impacts in work places, examined 194 respondents in studies which were conducted in only Western countries, using quantitative, qualitative and mixed methods, out of which 147 were empirical, while reviews were 28 and 19 were theoretical, they found that staff productivity was negatively impacted in 11 of the studies by majorly technostress. However, Marsh et al., (2022) did not state the exact methodology which was used in the eleven studies where it was found that staff productivity was negatively affected by utilisation of digital technologies.

Although prior studies have examined digital transformation and staff productivity, much of the existing literature remains either technological deterministic or quantitatively oriented. Limited attention has been given to how the alignment between digital tools and specific work tasks shapes staff productivity, particularly in developing manufacturing countries such as Nigeria. This study addresses this gap by applying Technology Task Fit theory using the qualitative research design to explore how digital transformation initiatives align with task requirements to influence staff productivity outcomes.

Theoretical Positioning of Technology Task Fit Theory

While theories such as TAM and UTAUT focus primarily on user acceptance and behavioural intention, they are

less suited to explained productivity outcomes in complex organisational settings. Technology Task Fit Theory is particularly appropriate for this study as it emphasises the alignment between technological capabilities and task requirements, which is central to understanding productivity in manufacturing environments undergoing digital transformation. TAM and UTAUT are therefore treated as complementary perspectives rather than the primary analytical framework.

Review of Relevant Theory

Technology Task Fit

The Technology Task Fit theory was developed in the adoption of information systems, with the objective of testing and verifying the assumptions that the use of information systems leads to improved performance when user task requirements correspond with the functionality of the technology (Marikyan & Papagiannidis, 2023). According to Dash et al., (2022) Technology Task Fit contends that an information system effectiveness relies on how effective a job and technology interlock, and encourages adaptability and innovation more than technical, environmental, and individual factors.

Technology Task Fit theory represents an interconnection between a user of technology, technology and the characteristics of a task conducted by the user (Marikyan & Papagiannidis, 2023). While, Ismail et al., (2024) stated that Technology Task Fit refers to the alignment between technology and the task user. According to Marikyan and Papagiannidis, (2023) the Technology Task Fit model consists of five constructs which are characteristics of technology, characteristics of task, technology-task fit, technology utilisation and performance impact, which is shown in figure 4 below.

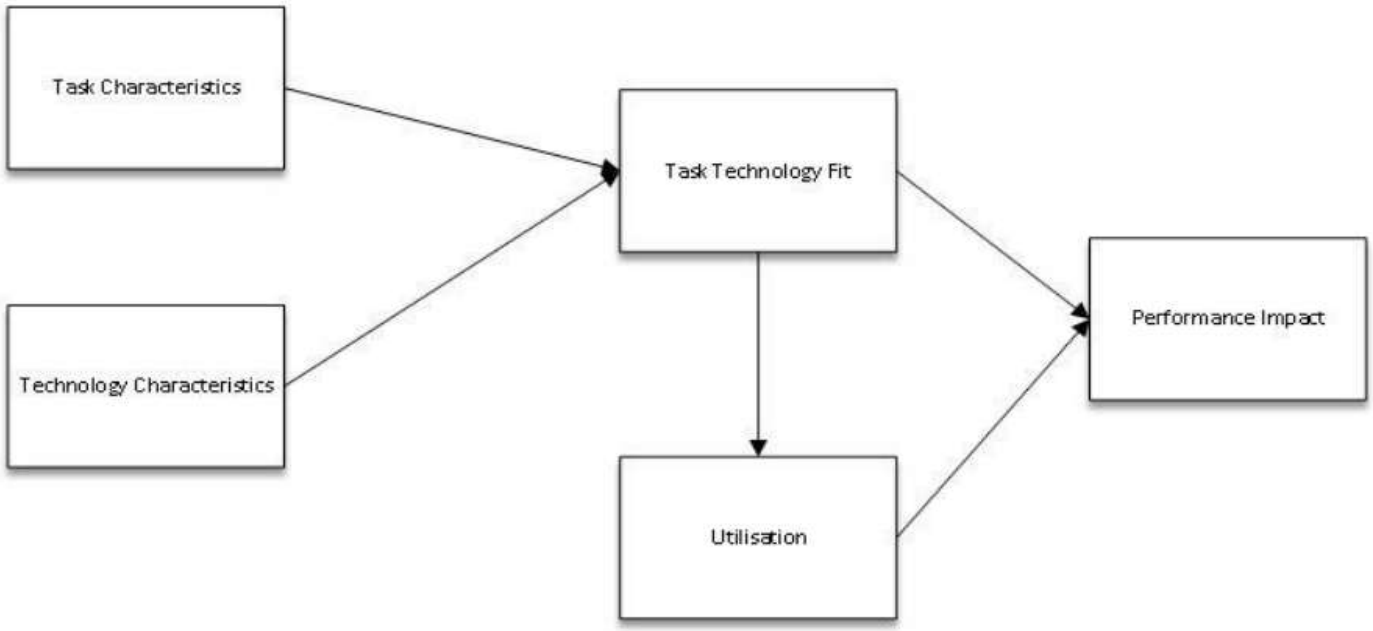


Figure 1: Technology Task Fit Model

(Source: Marikyan & Papagiannidis, 2023)

According to Park, (2019) harmonizing technology characteristics to the task of users is an apparent method to implement digital technologies. Equally, Ismail et al., (2024) argued that as digital technologies disrupt traditional methods of doing work and business, matching the task of users to the characteristics of technology is critical in digital transformation. Shi et al., (2023) stated that staff technology task misfit is a major cause of problems such as slow productivity growth, and poor transformation sustainability during digital transformation.

METHODOLOGY

The study adopted qualitative research design as it is associated with interpretivism (Saunders et al., 2023). The choice of this research is mono-method qualitative research, as one qualitative data collection procedure and

corresponding analysis technique ensured that rich valuable insights are obtained to answer research questions unlike quantitative research that do not have the constraints of structure, as Saunders et al., (2023), stated that methods used in qualitative research are unstructured or semi structured so that research questions can emerge or be alter in a natural and interactive process. However, quantitative research examine relationship between variables in a standard manner, which is rigid and do not allow for generation of diverse thoughts which are needed to better understand digital transformation and staff productivity in the manufacturing sector of Nigeria.

The objective of this study was addressed using non statistical generalisations, hence a nonprobability sampling procedure was adopted to collect data, and to ensure the inclusion of relevant and knowledgeable participants, purposive sampling was used to select individuals who have sufficient direct experience with digital transformation in the manufacturing sector. The sample size was between 5 to 10 participants. With the criteria for inclusion been that participants were managers and Information Technology professionals involved in digital initiatives, who are staff working in manufacturing firms in Nigeria, with 10 to 15 years of experience. The rationale for the choice of these participants was that they have firsthand knowledge and practical experience with digital transformation in different Nigeria manufacturing firms, which have different manufacturing process and products, and their insights are crucial for understanding how digital transformation affects operations and outcomes. As the participants have varied rich firsthand experience, they are able to provide deeply rich insights through which analytical generalization will be achieved despite the sample size.

Semi structure interviews were held online via Microsoft Teams. Each participant was interviewed for a duration of forty-five minutes, and the interview audio recorded, and transcribed to protect participants' privacy. The audio recording was passworded and duplicated for the protection of the recording. The transcript was checked to ensure the transcription was accurate by conducting data cleaning and a copy sent to the participant for final checking. Transcript from the interview was analysed using inductive thematic analysis to identify themes (topics) from the different interview transcripts, by first generating codes which captured the data significant message through identifying things (facts, statements, words, or phrases) that are repetitive, while remembering that individuals may speak about things indirectly in the form of metaphor. Codes were grouped into broader themes. A connection between the themes were identified which became the theories that were conceptualised and answered the different research questions.

Objectivity was maintained in interpreting data obtained from participants to prevent bias, even as interpretations were grounded in verbatim data extracts. Although the sample size is small, qualitative research prioritises depth of insight over statistical representativeness. The study adopts analytic generalisation by linking empirical findings to established theoretical constructs within Technology Task Fit theory. It is supported by thick description of context, participant roles, and organisational settings, allowing readers to assess the applications of findings to similar contexts.

RESULTS AND DISCUSSION

Examining digital transformation impact on staff productivity within the Nigeria manufacturing sector

Operational and Efficiency Gains

Table 1 showed that digital transformation has improved staff productivity across manufacturing companies as automation of routine tasks has increased outputs, real time data enables informed decisions and integrated systems which enforces standard have minimise errors resulting in higher staff efficiency. Findings revealed the reform of operational processes by digital technologies as posited by Plekhanov (2023) and Sui et al., (2024). While there was widespread adoption of ERP systems like SAP, automation, cloud computing and Internet of Things, which aligns with Vial (2019) assertion that digital transformation involves the merger of digital tools. Conversely, participants reveal there is partial adoption of digital systems across branches of organisations alongside limited adoption of artificial intelligence for decision making. This does not align with Nadkarni and Prügl (2021) argument that seamless integration of different digital technologies in an organisation is required in digital transformation.

Human Capital Development and Role Transformation

Digital transformation has necessitated the upskilling of staffs, redefining existing roles as staff are required to

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undertake trainings and adapt to new responsibilities due to their engagement with digital tools. Findings indicated the need to match digital tools with job demands, with technicians having limited digital skills struggling to adapt to task and systems that are technically complex resulting in disruptions in workflows, and reflects Shi et al., (2023) view that technology task misfit hampers transformation sustainability and productivity growth.

Social Technical Challenges

Despite it benefits digital transformation has led to skill gaps, over reliance on digital tools and disruption of work life balance due to digital access with productivity of staff been vulnerable to system failures and internet outage. While older staffs especially have been resistant to change. Findings indicate the benefit of training which is a hygiene factor of the Herzberg Two Factor Theory in enabling staff to adapt to digital technologies, which aligns with the need for a responsive digital upskilling recommended by Adeyinka (2023) and Chiemeke and Imafidor (2020),.However, motivator factors such as growth and recognitions were rarely mentioned indicating that while firms may be focusing on training, even as Xinyue and Marcelo (2024) stated that without adequate training staff may be demotivated to use digital tools, they are not yet leveraging intrinsic motivators to boost engagement with digital technologies and thereby boost productivity.

Table 1: Distribution of response on digital transformation impact and staff productivity within the Nigeria manufacturing sector

STATEMENTS	CODES	THEMES
1.We have improvements in our daily turn out. We can measure our day-to-day performance and improvements in outputs.	Increased efficiency	Operational and efficiency gains
2. It has helped drive informed business decision and has skyrocketed productivity because people now have access to information real time	Enhanced decision making	
3. Staff become happier and are more agile, error has reduced	Reduced errors	
4. I can also use this to connect to the world, even to the OEM in Italy, France, in anywhere to say I am stuck I need your support	Global collaboration and exposure	
5. It has given them more opportunity to learn. It makes you add more knowledge to yourself and makes you more valuable to the company.	Skill development	Human capital development and role transformation
6. New roles are taking up. So, we have some roles that are created because of the introduction of the digital technology.	Job redefinition	
7.Resistance to change is one of the impedances to digital transformation some people will say this cannot work	Resistance to change	Social Technical Challenges
8.Most staff don't actually know how to make use of these technologies	Skill Gaps	
9.Some people don't know the barrier between office and home again; they take offices home	Work life boundary blurring	
10. Internet connectivity is a major problem. So, most of this digital transformation has a lot to do with Internet. So anytime the connectivity is poor, the performance usually is poor	Productivity dependence on connectivity	

11.Switching between one app to another, one software to the other software. So, at the end of the day, you become tired and worn out.	Cognitive overload	
12.Has also made people lazy, for example, AI. A lot of people can't even type emails from their head anymore can't construct emails.	Over reliance on tools	

Source: Field Survey, 2025

Synthesis the adoption of digital transformation on the performance of Nigerian manufacturing companies

Table 2 revealed that Nigeria manufacturing firms have made progress in digitizing processes particularly through ERP systems like SAP, robotics and automation technologies, with participants revealing the transformative benefits such as improvement in efficiency, quality, safety, and productivity of staff. This is because the functional attributes of the digital technologies align closely with core task requirements. However, beneath these benefits lies the barriers that threaten the sustainability of digital gains especially staff productivity. Some staff tend to struggle to transition from analogue to digital platforms leading to dependencies and productivity loss. Tiered training programs matched to digital competencies should be offered to staff, alongside mentoring by peers who are advance users, as done in a participant firm.

Strategic Implementation of Digital Transformation

Table 2 showed that Nigeria manufacturing companies need to adopt phased and adaptive approach to digital transformation, identifying and focusing on priority and high impact areas to implement digital systems incrementally while considering financial constraints and operational realities. Findings showed there are technicians that lack ability or willingness to interact with advanced digital tools which results to operational disruption and aligns with the assertion of Dacron and Pascual (2018) that a mismatch between staff skills and technology weakens productivity gains. As the technology task fit theory requires technologies to be aligned with nature of task and staff capabilities (Marikyan &Papagiannidis, 2023). Equally, findings request the upskilling of staff in the sector on digital technologies which support Adeyinka (2023) and Laoye (2023) argument that there should be investment in training and upskilling staff in Nigeria manufacturing sector to improve their productivity.

Technological Integration and Adoption

Deployment of specific digital technologies such as ERP like SAP which provides end to end visibility and coordination, automation which reduces manual operations, IoT for real time monitoring and AI for decision making will enhance performance. Findings demonstrate that low digital proficiency amongst older staff resulted to their demotivation and in certain cases subsequent redundancy and recommend that staff be motivated to adapt to the use of digital tools. As emphasised by Xinyue and Marcelo (2024) that integrating motivational strategies with digital transformation results to improved productivity and staff satisfaction and supports the Herzberg Two Factor Theory hygiene factors of adequate training, working conditions and job security (Peramatzis & Galanakis, 2024).

Advancing Operational and Organisational Sustainability

Automating processes reduce material waste, transitioning to digital documentation minimises paper use, and monitoring of energy consumption and optimisation through data analytics enhances sustainability. The findings of this research reveal that digital transformation has clearly enhanced organisations operational capabilities through ERP systems, automation, and real time monitoring which corroborate the views of Plekhanov et al., (2023) and Sui et al., (2024) that digital transformation does not simply imply a technological shift but an overhaul of organisations strategy and structures.

Competitive Positioning and Market Responsiveness

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When digital platforms are seen as appropriate for an ordering task, users find it easier and useful, which drives continuous patronage and support business sustainability (Inthong et al., 2022). Similarly, Ghanavatinejad et al., (2025) argued that automated tracking directly fit the task of monitoring orders and deliveries in real time. Integrated digital solutions in logistics and supply chain supports task that require cross functional coordination and enhances responsiveness (Albrecht et al., 2023; Atieh et al., 2025). Findings illustrates that digital ordering systems, automated tracking and integrated logistics platforms adoptions enable companies and their staff to respond quickly to market demands, improving customer satisfaction and brand reputation. This high technology task fit enables rapid response to market demands, which translates into higher customer satisfaction and over time a strong brand reputation.

Table 2: Distribution of response on the adoption of digital transformation on the performance of Nigerian manufacturing companies

Statements	Codes	Themes
1. We have been able to implement it in two factories of our company before the end of the year; we plan that at least two more factories will be going live with ERP and SAP.	Phased implementation	Strategic implementation of digital transformation
2. We are doing it systematically depending on what gives us the biggest gain per time.	Priority-based deployment	Strategic implementation of digital transformation
3. Integration with the existing system was also part of it. There was a system on ground before; now we want to integrate this digital technology into it.	Integration of legacy systems	Strategic implementation of digital transformation
4. We use SAP which integrates all our activities in the supply chain from end to end.	ERP system utilisation	Technological integration and adoption
5. We have taken paper-based processes and automated them into mobile and desktop applications.	Automation of manual tasks	Technological integration and adoption
6. Internet of Things enables real-time monitoring and control of production processes.	IoT and real-time monitoring	Technological integration and adoption
7. AI Gist integrated into SAP and Microsoft AI tools help draft critical business documents such as SOPs.	AI for process optimization	Technological integration and adoption
8. We are engaging in eco-friendly initiatives by automating paper-based processes such as daily production checklists.	Paperless operations	Advancing operational and organisational sustainability
9. This has really been helping us to get real-time data in our processes.	Waste reduction	Advancing operational and organisational sustainability
10. We introduced systems for analysing and tracking daily energy consumption in KWH per hour.	Energy monitoring	Advancing operational and organisational sustainability

11. Customers can place orders and see them in real time, knowing exactly what has been requested.	Market responsiveness	Competitive positioning and market responsiveness
12. We look at how to improve it and ensure that we are more competitive in the market.	Brand enhancement	Competitive positioning and market responsiveness
13. Paperwork was not error-free; now data can be tracked, traced, and recorded, making manipulation difficult.	Data integrity and transparency	Governance, accountability, and performance control
14. We have training databases and online platforms such as Analytics G.O.A.L. and D&C Academy for staff training.	Training and skill development	Capacity building and support systems
15. SharePoint is used to share information on AI and data analytics initiatives within the company.	Internal knowledge platform	Capacity building and support systems
16. Remote support from international experts enables problem-solving through system integration.	Global collaboration	Capacity building and support systems

CONCLUSION

The study concludes that digital transformation has increased productivity of staff in the sector as automation of routine tasks has increased outputs. The real time data also enables informed decisions and integrated systems which enforces standard, have minimise errors resulting in higher staff efficiency. The productivity of staff now depends on the availability of infrastructures such as power supply and internet connectivity and the provision of support structures and trainings. Similarly, the study concludes that, to improve performance, competitive advantage and sustainability, firms should adopt a strategic implementation of digital transformation through a phased and priority-based approach. With a focus on aspects of their operations which are critical while deploying specific technologies such as automation, enterprise resource planning, data analytics and Internet of Things and enhancing their organisational and operational sustainability through waste reduction and positioning themselves competitively in the market while enshrining capacity building and support system in their organisations.

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