



## Digital Innovation and Performance in a Public Sector Para-Military Organisation: Unveiling the Mediating mechanisms of Transformational Leadership

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### Article information

### ABSTRACT

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Public-sector paramilitary organisations in developing country contexts face increasing pressure to enhance operational efficiency, border security, and service delivery amid rising migration complexities and technological change. The Nigeria Immigration Service (NIS) has struggled with bureaucratic inefficiencies, legacy systems, and capacity constraints, creating an urgent need for digitally enabled reforms. This study investigates how digital innovation can improve organisational performance in the NIS, and examines the mediating role of transformational leadership in the relationship between digital innovation and organisational performance. Underpinned by the dynamic capabilities theory, the study employed quantitative survey research with primary data using questionnaire as a survey instrument on 222 respondents drawn from high-ranking officers of the NIS Headquarters in Abuja and Lagos Nigeria. The data collected was analysed using Partial Least Squares-Structural Equation Modelling (Smart-PLS) to test the significance of the variables. The findings revealed significant and positive relationships, emphasizing the strategic influence of digital innovation driving organizational performance ( $\beta = 0.360$ ,  $t = 10.024$ ,  $f^2 = 0.166$ ,  $R^2 = 0.452$ , Adjusted  $R^2 = 0.447$  and  $p < 0.05$ ). These results offer strategic insights into the valuable relevance of digital innovation to drive organisational performance in the public sector. Transformational leadership emerged as a critical determinant of an enhanced performance. The study offers important implications for public policy and administrative reform. It suggests that government efforts to modernise agencies like the NIS should move beyond technology acquisition to include leadership development, institutional capacity building, and change management frameworks. Embedding transformational leadership within digital reform strategies can enhance policy effectiveness, strengthen organisational resilience, and improve public service outcomes in security-sensitive sectors.

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**Keywords:** Digital innovation, Transformational leadership, Organisational performance, Nigeria immigration service

## INTRODUCTION

The 4<sup>th</sup> industrial revolution has brought about a global competitive environment which is propelled by digital technologies. The technology which brought about digital innovation is increasingly becoming more important in achieving organisational strategic goals. Digital innovation (DI) has caught the attention of scholars, as innovation is seen as an indispensable factor for growth, required to adapt to rapid changes. Following the boom in the agricultural and industrial economy, the digital economy has progressively emerged as a main driver of the global economy (Huang *et al.*, 2023).

Amid the Fourth Industrial Revolution, which is characterized by rapid technological advancement and digital technologies, innovation has emerged as a crucial driver of progress. Private and public sector organisations have embraced innovation and sustainable strategies to overcome developmental hurdles and ensure the welfare of all citizens by charting a new course for Africa's future growth and prosperity. Digital innovation involves the application and adoption of digital technologies in a strategic manner to improve business operations and create novel products and services. It involves a systemic overhaul that disrupts traditional methods and fosters competitiveness within the organisation. This involves categories of dimensions which includes digital innovation initiation, development, implementation and exploitation (Kohli & Melville, 2019). Digital initiation triggers opportunity identification and decision making. Development involves, designing, developing and adopting. Implementation involves, installing, maintaining, training and incentives. While exploitation maximizes returns, leveraging existing systems and data for new purposes. These four activities are deployed as strategic components in digital innovation efforts for this study.

Meanwhile, transformational leadership has been identified as a concept that has the capacity to enhance the capability of digital innovation on organisational variables (Ali *et al.*, 2024) as organisations in the public sector within an economy are crucial in the creation of public services. These public organizations provide services, essential to the socio-economic life and

national security of the country (Tran *et al.*, 2021). Such public service organizations like the Nigeria Immigration Service provides services to guide the image of the country and ensure national security. Public sector organizations have been under great pressure from structural and governance reform policies over time (Tetteh *et al.*, 2021). To adapt to this change of structures, such organizations are often interested in reform elements such as digital innovation (Van Der Wal & Demircioglu, 2020). Studies have also indicated that transformational leadership styles enhance organizational change (Agolla & Van Lill, 2016; Sun & Henderson, 2017). As transformational leaders drive new visions, and create values that play vital roles in innovation. It has been further observed that transformational leadership plays a vital role on innovation as it enhances goal-oriented behavior and positive motivation among subordinates. These arguments reinforce that transformational leadership is a significant predictor of various organisational outcomes (Al- Husseini & Elbeltagi, 2016; Sun & Henderson, 2017).

Despite the growing global interest in digital innovation, empirical evidence on its impact within public-sector organisations particularly paramilitary institutions remains limited. While existing studies highlight the role of digital innovation in improving efficiency in private firms (Li *et al.*, 2022), there is insufficient quantitative analysis of its effects and underlying mechanisms in public organisations (Huang *et al.*, 2023). Against this backdrop, this study seeks to answer two key questions: what is the effect of digital innovation on organisational performance in the Nigeria Immigration Service, and to what extent does transformational leadership mediate this relationship? By integrating these constructs, the study provides empirical insights into how digital transformation can be effectively leveraged to enhance performance in public-sector environments.

## LITERATURE REVIEW

### Digital innovation (DI)

The concept of DI has different perspectives. DI has been described as the use of digital technology in the innovation process to produce or provide services for economic activities (Huang *et al.*, 2023). It can also be described as the process of adopting digital technology for innovation

purposes, which include the improvement of firm performance and emergence of new products and services. Digital innovation is strategic in management literature regarding its predictive capabilities on organisational variables. [Abrell \*et al.\* \(2016\)](#) described DI, as carrying out a new combination of digital and physical components to produce novel products and services within the organisation. It is the creation of, and consequent change in market offerings, business processes or models that result from the use of digital technologies ([Nambisan \*et al.\*, 2017](#)). DI is described to be the creation or adoption and exploitation of an inherently unbranded, value-adding novelty (e.g. products, services, processors and business models), through the incorporation of digital technology ([Hund \*et al.\*, 2021](#)). It is new combinations of digital and physical components to produce new products and services by combining digital data from heterogeneous sources easily to deliver diverse services, which dissolves product and industry boundaries ([Barrett \*et al.\*, 2015](#)). Moreover, digital innovation is largely about recombining existing resources and knowledge to spur new ideas which is rarely guided by a long-term vision, because products and services are inherently unbounded and incomplete. Furthermore, digital innovation refers to a firm's strategic choices made to execute digitally enhanced value-adding activities, transforming business models, and enabling new product and service offerings that involves a robust multidimensional processes and activities ([Schneckenberg \*et al.\*, 2021](#)). [Kohli & Melville \(2019\)](#) opined in their study that digital innovation could be examined in four perspectives of initiation, developing, implementing and exploit. These perspectives are entirely organisational activities. The activities of initiating mean to trigger, opportunity identification and decision making, regarding digital innovation. Developing means, designing, developing and adopting. Implementing means, installing, maintaining, training and incentives while exploit means maximizing returns, leveraging existing systems and data for new purposes.

Empirically, [Yasa \*et al.\* \(2019\)](#) examined the role of digital innovation as mediator on digital capability in business performance. The quantitative study showed that digital capability variable has a positive and significant effect on business

performance and digital innovation has a positive relationship. Empirical literature further showed that digital innovation predicts firm performance ([Hanelt \*et al.\*, 2021](#)). Research shows that digital innovation has the potency to drive firm performance within the context of digital economy and to enhance organisational value ([Huang \*et al.\*, 2023](#)).

### **Organizational Performance (OP)**

Due to the complexity in the operational system of public sector organisations, the literature suggests that organisational performance in the public sector is a multidimensional concept ([Pollanen \*et al.\*, 2017](#)). The feature of public organizations is that there are many stakeholders with diverse goals ([Andersen \*et al.\*, 2016](#)). These lead to a variety of expectations for organizational performance. Whereas some scholars have described organizational performance quantitatively, this view is often inadequate for the public sector as the performance of this sector is opined to be considered both quantitatively and qualitatively ([Van de Ven & Ferry, 1980](#); [Verbeeten, 2008](#)). Quantitative aspects are budget efficiency, quantity of products and services produced, revenue, and profit, while the qualitative are service quality, innovation, customer satisfaction, and long-term effectiveness. It is furthermore argued that organisational performance includes aspects of financial results, social outcomes, and the ability to meet public needs ([George \*et al.\*, 2019](#)).

### **Transformational Leadership (TFL)**

Transformational Leadership Style is described in literature as a leadership style that transforms followers to rise above their self interest through their morale, ideals, interest and values, motivating them to perform better than initially expected" ([Pieterse \*et al.\*, 2010](#)). This leadership style is utilised in raising employees' moral and ethical values toward change and reform. Transformational leaders embrace adaptation by developing vision to inspire followers ([Kwarteng \*et al.\*, 2024](#)). This approach makes leadership to instigate the followership to identify interests, goals and to achieve beyond expectations ([Buil \*et al.\*, 2019](#)). This leadership style, plays an essential role in efficient management and bringing changes to the organization as such leaders have the capacity to transform an organization by articulating a vision through clarifying and empowering employees

work to achieve such vision. TFL contains four important behavioral patterns, which are, idealized influence, inspirational motivation, intellectual stimulation and individualized consideration (Buil *et al.*, 2019).

The idealized influence is described in charisma, as explained by Bass (1990) and Buil *et al.* (2019) which denotes leaders reflecting moral and ethical behavior. Inspirational motivation is described as the ability to instigate followers' attitude by articulating an inspirational vision. Intellectual stimulation involves the leader's ability to inspire followers to innovate and demonstrate new challenges with problems and analyse them to find new ideas and ways in solving the problems. Meanwhile, the individualized consideration describes the care on subordinates' needs by paying attention to their development through coaching and mentoring activities. Studies have shown that transformational leadership style is more strategic than other leadership styles in enhancing promoting behavioral outcomes within organisations (Ali and Ullah, 2023; Kwarteng *et al.*, 2024).

The following hypotheses are drawn from the literature review for the study;

- H1. *There is no significant effect of digital innovation on organisational performance in the Nigeria Immigration Service.*
- H2. *There is no significant mediating effect of transformational leadership on the relationship between digital innovation and organisational performance in the Nigeria Immigration Service.*

### **Underpinning Theory**

This study is underpinned by Dynamic Capabilities Theory (DCT), propounded by Teece & Pisano (1994). DCT describes the firm's ability to adapt, innovate and reconfigure internal and external competencies to respond to rapidly changing environments. DCT is an extension of the Resource-based View (RBV) propounded by Barney (1991), but extends it to dynamic contexts. RBV is considered static in nature to explain the competitive advantage of the firm in changing market environments (Priem & Butlen, 2001). However, the process of maintaining competitive drive is limitless in its dynamic process (Hung *et*

*al.*, 2010). Hence the need for firms to develop specific capabilities and progressive learning to focus on new environments. The assumptions of DCT involves, resource heterogeneity, dynamic environments, learning and innovation. It posits how organisations create and sustain competitive advantage. Previous research has provided significant definitions on dynamic capabilities. Eisenhardt and Martin (2000) opined dynamic capabilities to be the process of using resources to create new resources that can create market change. A market is changed when it evolves, emerges and split. Moreover, dynamic capabilities are the result of the alteration of resources that have been acquired, integrated and recombined to develop new creation of strategies (Teece & Pisano, 1994). The relationship between dynamic capabilities on digital innovation and organizational performance has revealed positive relationship (Hung *et al.*, 2010).

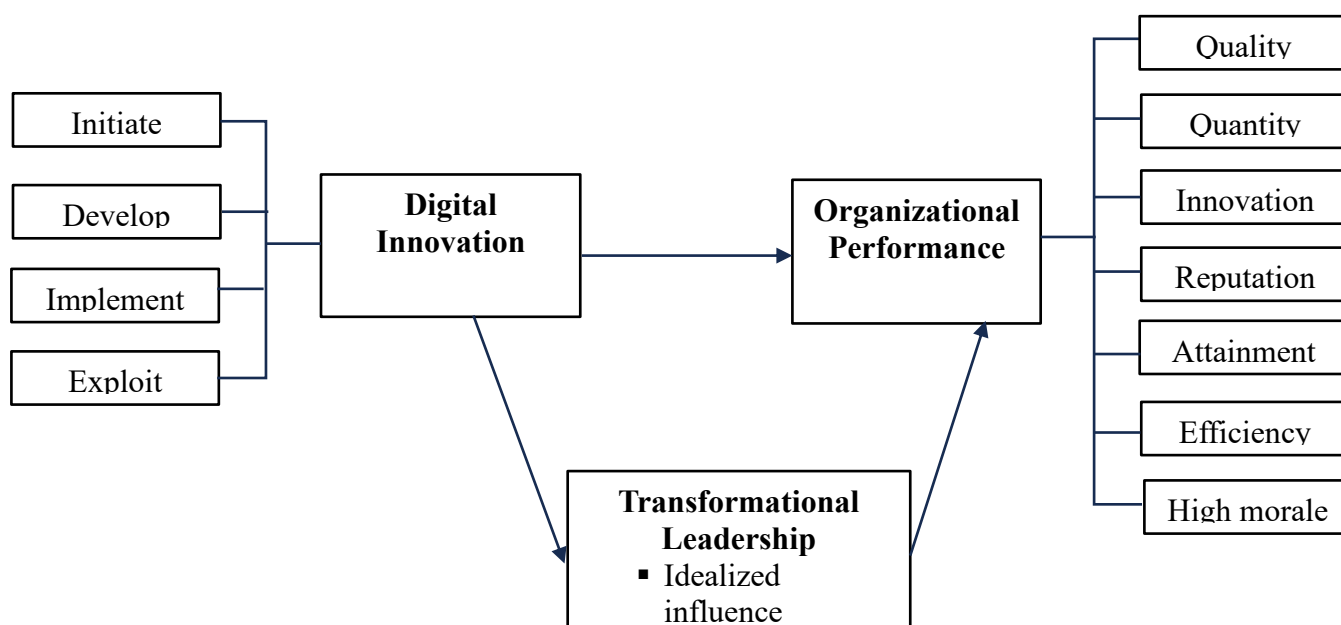
### **Conceptual Framework**

The conceptual framework displays the interrelationships among the three variables of the study with their corresponding indicators.

## **METHODOLOGY**

### **Research Design**

This study investigates the influence of digital innovation through transformational leadership on organisational performance in the Nigeria Immigration Service (NIS). The survey design with quantitative approach study, was carried out in NIS corporate headquarters in Abuja and Lagos main command which controls the highest volume of immigration services in the country. The NIS is responsible for policy formulation, strategic planning, and coordination of immigration activities nationwide, controlling people moving in and out of the country, issuance of travel documents including passports to Nigerians within and outside Nigeria, issuance of residence permits to foreigners in Nigeria, controlling trafficking of migrants, control of Nigeria borders (Air, Sea and Land), investigation and surveillance, and enforcement of laws and regulations as charged. The population of the study was sourced from the human resources directorate of NIS in 2025, and consists of 1772 senior ranking personnel ranging from inspector, assistant superintendent and officers at the controller and lower cadres spanning through the



**Source:** Adapted from Kohli & Melville (2019); Campbell (2018); Kroll & Vogel (2014)

directorates within the organisation. Random sampling technique was used to guarantee a fair and impartial selection of participants. The sample size of 326 was determined in a desired level of precision (margin of error) of 0.05 using Slovin (1960) formula.

### Data Collection

The data collection process was designed to ensure that all the main variables of the study with their specific measures were captured. The study engaged primary source of data through a well-structured questionnaire as data instrument. Survey emerged as the most preferred tool for capturing comprehensive insights into the interplay between digital innovation technologies, transformational leadership and organizational performance in NIS. The questionnaire was designed in line with five-point Likert scale measurement to elicit the respondent's responses via a Google form online generated link shared through the WhatsApp numbers and email platform of the respondents.

### Variable Measurement

Constructs were measured by adapting observable variables which have been tested and validated in previous empirical studies. Digital Innovation (DI- initiation, development, implementation and exploitation) was measured with constructs as provided by Kohli & Melville (2019).

Transformational Leadership (TFL) was measured by observable variables of-idealised influence and intellectual motivation (House,1998; Campbell, 2018; Kroll & Vogel, 2014) and organisational performance (OP) was measured by a verified performance assessment of public organisations designed by Van de Ven and Ferry (1980) which has been widely used in public sector organisational performance measurements (Verbeeten & Spekle, 2015; Yen *et al.*, 2021). The scale includes seven observable indices- quantity, quality, innovation, reputation, attainment, efficiency and high morale.

### Method of Data Analysis

The study adopted both descriptive and inferential statistical analysis. The descriptive statistics used were, frequencies and percentages employed to analyse the demographics of the respondents while the inferential statistical tool was Partial Least Squares Structural Equation Modelling (PLS-SEM) (SmartPLS 4). The partial least squares approach was used for data analysis and to validate the model. The PLS-SEM is a technique appropriate for a multivariate analysis (Hair *et al.*, 2013). It exhibits more statistical power to handle complex models such as assessment of measurement and structural models (Hair *et al.*, 2017).

## RESULTS

**Table 1:** Demographic Analysis of the Respondents

Variable	Frequency	Percentage
<b>Gender</b>		
Female	131	59.00
Male	91	41.00
Total	222	100
<b>Age in years</b>		
Below 20	47	21.17
20 -29	62	27.93
30 – 39	28	12.61
40 – 49	59	26.58
50 and above	26	11.71
Total	222	100
<b>Marital status</b>		
Single	78	35.14
Married	107	48.20
Divorced	16	7.21
Separated	13	5.83
Widowed	8	3.60
Total	222	100
<b>Literacy level</b>		
WASSCE/GCE	85	38.29
NCE/OND	30	13.51
HND/BSc	74	33.33
Postgraduate degree	33	14.84
Total	222	100
<b>Department Distribution</b>		
Passport/OTD	51	22.29
HRM	45	20.27
Visa/Residence	11	4.95
Investigation and Compliance	31	13.96
Finance and Accounts	11	4.95
Planning, Research and Statistic	29	13.06
Migration	17	7.66
Border management	27	12.16
Total	222	100

Source: Field Study, 2025

Table 1 presents the demographic characteristics of the 222 respondents included in the study. The gender distribution shows a fairly balanced sample, comprising 131 females (59.00%) and 91 males (41.00%). In terms of age, the majority of respondents fall within the 20-29 (27.93%) and 40-49 (26.58%) age brackets, followed by those below 20 years of age (21.17%). Respondents aged

between 30-39 years account for 12.61%, while those aged 50 years and above represent 11.71%, indicating a workforce largely composed of young and mid-career personnel. Regarding marital status, most respondents are married (48.20%), followed by single individuals (35.14%), with smaller proportions being divorced (7.21%), separated (5.86%), and widowed (3.60%). The educational profile shows that 38.29% hold WASSCE/GCE qualifications, 33.33% possess HND/B.Sc degrees, 14.84% have postgraduate qualifications, and 13.51% hold NCE/OND certificates, reflecting a moderately educated workforce. Departmentally, respondents are distributed across key units, with the highest representation from Passport/OTD (22.97%) and Human Resource Management (20.27%), followed by Investigation and Compliance (13.96%), Planning, Research and Statistics (13.06%), and Border Management (12.16%). Other departments include Migration (7.66%), Visa and Residence (4.95%), and Finance and Accounts (4.95%). Overall, the sample reflects a diverse and representative distribution across demographic and organisational characteristics.

### Effect of Digital Innovation on Organizational Performance

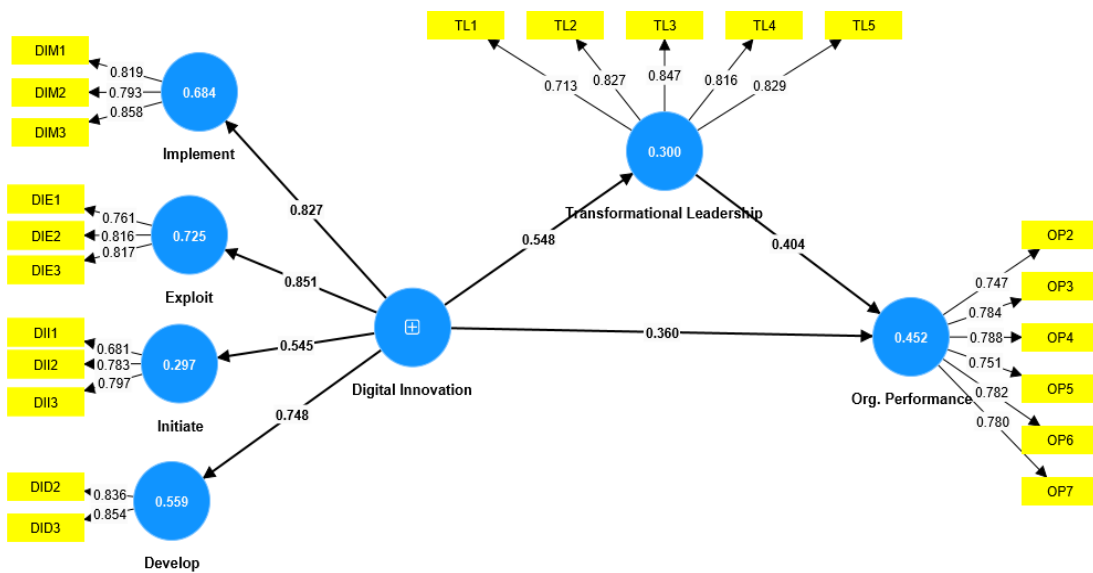
The data were analysed using Partial Least Squares-Structural Equation Modelling (PLS-SEM) via SmartPLS. The assessment of the measurement model confirmed that all constructs met the required thresholds for reliability and validity, including, internal consistency, convergent validity, and discriminant validity. Furthermore, the structural model evaluation indicated that the hypothesised relationships satisfied the recommended criteria, demonstrating adequate explanatory power and predictive relevance.

From Table 2 above, the Cronbach alpha and composite reliability values reveal the construct reliability of the variables which met the threshold of  $> 0.70$  while the AVE measures the validity of the variables with the threshold of  $> 0.50$ . The threshold is further revealed on the measurement model in Fig 1. The result from Table 3, reveals that the hypotheses demonstrate statistically significant and positive relationships, emphasizing the strategic importance of digital innovation to drive organizational performance in the Nigeria immigration service. Specifically, digital innovation has a substantial and statistically

**Table 2:** Assessment of Internal Consistency and Convergent Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Develop	0.600	0.601	0.833	0.714
Digital Innovation	0.823	0.839	0.862	0.371
Exploit	0.715	0.716	0.840	0.637
Implement	0.762	0.764	0.863	0.678
Initiate	0.624	0.636	0.799	0.571
Org. Performance	0.865	0.867	0.899	0.596
Transformational Leadership	0.866	0.868	0.903	0.652

Source: Field Study, 2025

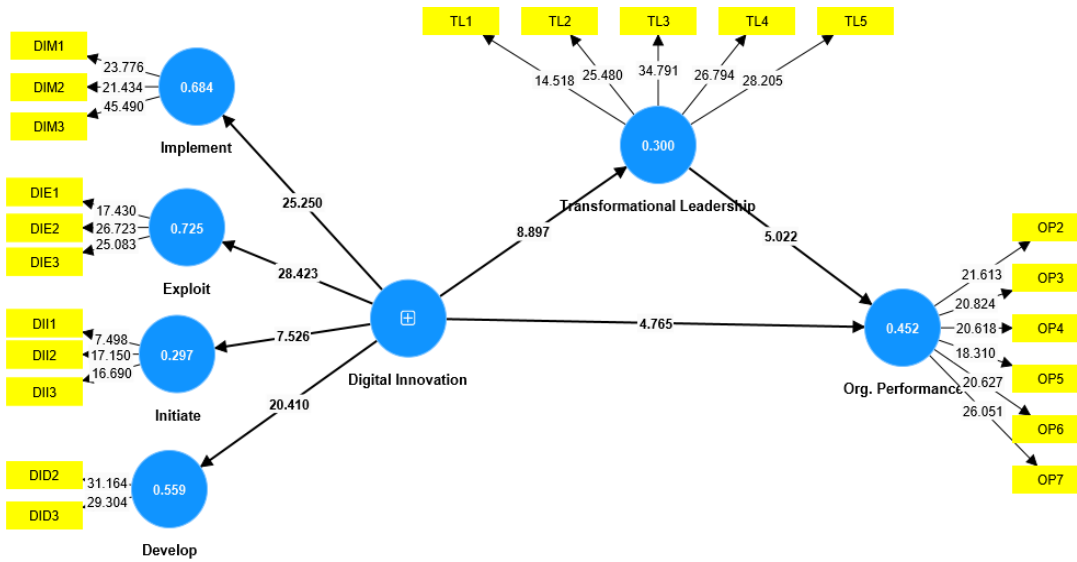


**Figure 1:** Model Path Coefficients

Source: Field Study, 2025

significant positive effect on organisational performance ( $\beta = 0.360$ ,  $t = 5.715$ ,  $f^2 = 0.920$ ,  $R^2 = 0.452$  and  $p < 0.05$ ) The explanatory power test results demonstrate the model’s effectiveness in elucidating the relationships between the two variables. The determination coefficient ( $R^2$ ) exceeded the recommended threshold of 0.10, which indicates substantial explanatory power. The model, as shown in Table 3 and Figure 2, showed the  $R^2$  value is 0.452 for organisational performance (OP) endogenous latent construct. This indicates that the independent constructs explain 45% of the variance in OP, meaning that 45% of the change (variation) in organisational performance was due to digital innovation technologies deployed in the organization. The values from the result affirms the

robustness of relationship observed in the model. The analysis from Table 4 shows the mediation result and the test of hypothesis 2. The mediation analysis was performed to assess the role of transformational leadership in the relationship between digital innovation (DI) and Organizational Performance (OP). The results showed a significant indirect effect of DI on OP ( $\beta = 0.330$ ,  $t = 5.715$ ,  $p < .001$ ). The total effect of DI on OP was significant ( $\beta = 0.604$ ,  $t = 9.933$ ,  $p < .001$ ), and with the inclusion of the mediator, the direct effect of DI on OP remained significant ( $\beta = 0.330$ ,  $t = 5.715$ ,  $p < .001$ ). This indicates that transformational leadership partially mediates the relationship between DI and OP.



**Figure 2:** Structural Model Path Coefficient

Source: Field Study, 2025

**Table 3:** Testing of Hypothesis 1 Results

Hypothesised Path	Beta	Standard Deviation (STDEV)	T-statistics	p-value	f-square	R-Square
DI – OP	0.360	0.059	5.715	0.000	0.910	0.452

**Table 4:** Testing of Hypothesis 2 Results

The mediation effect of transformational leadership

Path	Coefficient (β)	Std. Error	t-value	p-value	Remark	Mediation Type
Total Effect (IV→DV)	0.604	0.061	9.933	<0.001	Significant	
Direct Effect (IV→DV)	0.330	0.058	5.715	<0.001	Significant	Partial mediation
Indirect Effect (IV→MV→DV)	0.330	0.058	5.715	<0.001	Significant	

Source: Field survey (2025)

## DISCUSSION

The findings of this study provide strong empirical support for the strategic role of digital innovation (DI) in enhancing organisational performance within the Nigeria Immigration Service. Consistent with prior studies (Yasa *et al.*, 2019; Hanelt *et al.*, 2021), the results demonstrate that digital innovation significantly improves performance outcomes, reinforcing the view that organisations operating in digitally evolving environments must continuously adapt their processes and capabilities. Similarly, the findings align with Huang *et al.* (2023), who emphasise that digital innovation

enhances organisational value and competitiveness within the digital economy. Interpreted through the lens of Dynamic Capabilities Theory (DCT), the results suggest that digital innovation functions as a dynamic capability that enables organisations to sense opportunities, seize technological advancements, and reconfigure internal processes to improve performance. The dimensions of digital innovation; initiation, development, implementation, and exploitation, reflect these capabilities by facilitating organisational responsiveness and adaptability in complex environments.

In the context of the Nigeria Immigration Service, this implies that the effective deployment of digital technologies can strengthen operational efficiency, enhance service delivery, and improve border management systems. Importantly, the study reveals that transformational leadership plays a mediating role in this relationship, highlighting that leadership is a critical mechanism through which digital innovation translates into performance gains. This finding is consistent with existing literature, which underscores the role of transformational leadership in fostering innovation, motivating employees, and facilitating organisational change (Agolla & Van Lill, 2016; Al-Husseini & Elbeltagi, 2016; Sun & Henderson, 2017). Within the DCT framework, transformational leadership can be viewed as an enabling capability that supports the reconfiguration of organisational resources and the effective orchestration of digital initiatives.

From a policy perspective, the findings suggest that digital transformation efforts in public-sector organisations should not be limited to technological investments alone. For agencies such as the Nigeria Immigration Service, policymakers must prioritise leadership development, institutional capacity building, and change management strategies alongside digital infrastructure. Embedding transformational leadership competencies within public-sector reforms can enhance the success of digital initiatives and ensure that technological investments yield measurable performance. Practically, the results indicate that management and stakeholders within NIS should adopt an integrated approach to digital innovation by aligning technology deployment with leadership practices and organisational goals. This includes investing in staff training, fostering a culture of innovation, and strengthening coordination across departments to maximise the benefits of digital systems. For the NIS, such an approach can lead to improved efficiency in passport processing, enhanced data management, and more effective border control operations. Overall, the study contributes to both theory and practice by demonstrating that the relationship between digital innovation and organisational performance is contingent upon leadership capabilities. By grounding the findings in Dynamic Capabilities Theory, the study provides a nuanced understanding of how public-sector organisations

can leverage digital transformation to achieve sustainable performance outcomes.

## CONCLUSION AND RECOMMENDATIONS

The study revealed the capability of digital innovation in its four dimensions to enhancing performance in the Nigeria Immigration Service. The study further revealed that transformational leadership within the organisation partially mediates the relationship between digital innovation and performance of the Nigeria immigration service. The study has a link to the relevance of dynamic capabilities theory, that emphasizes the firm's ability to adapt, innovate and integrate, internal and external competencies to respond to changing environments. The study recommends progressive investment in digital innovation processes to enhance performance of the immigration management systems in Nigeria. The study further recommends transformational leadership styles within the organisation from senior level immigration employees in their relationship with other employees/officers. Future research could employ interviews and focused group as an instrument to generate data, which could make such study qualitative. Secondly, this study was carried out in one of the several paramilitary agencies of government in Nigeria, as future research could consider the other relevant para-military agency to investigate if the deployment of digital innovation technologies could enhance performance.

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