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# Workforce Digital Capability and Service Delivery Sustainability among Universities in Ilorin, Kwara State, Nigeria

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**Abstract.** Organisations are increasingly relying on digital technologies to support communication, operational activities, and service delivery processes, but despite substantial investments in digital technologies, many organisations continue to encounte service disruptions, inefficient work processes, under-utilisation of digital systems, and inconsistent service outcomes. These persistent challenges suggest that the availability of digital technologies alone may not guarantee sustainable service delivery, highlighting the need to examine workforce-related factors that influence the effective use of digital resources. This study therefore examined the effect of workforce digital capability on service delivery sustainability, with particular focus on workforce digital skills and workforce adaptability. A cross-sectional survey design was adopted for the study and data were collected from 340 academic and non-academic staff members of selected universities in Ilorin, Kwara State, using a structured questionnaire. The data were analysed using multiple regression analysis. The findings of the study revealed that workforce digital skills significantly influenced service delivery sustainability ($F = 202.60$, $p < 0.05$), accounting for 64.3% of the variation in service delivery sustainability ($R^2 = 0.643$). Specifically, digital literacy, digital communication skills, and digital problem-solving ability had significant positive effects on service delivery sustainability. Similarly, workforce adaptability significantly influenced service delivery sustainability ($F = 157.66$, $p < 0.05$), explaining 58.4% of the variation ($R^2 = 0.584$). Technological adaptability, continuous learning orientation, and work process flexibility were also found to have significant positive effects on service delivery sustainability. The study concluded that digital skills and adaptability are critical resources for maintaining efficient, reliable, and sustainable service delivery in digitally evolving organisations. The study recommended continuous digital training, workforce upskilling, and adaptability development initiatives to enhance long-term service delivery performance.

**Keywords:** Workforce, Digital Capability, Service Delivery, Sustainability

## 1. Background to the Study

Modern organisations increasingly rely on digital technologies to support communication, service operations, and stakeholder engagement. The rapid expansion of digital platforms, cloud systems, and artificial intelligence has fundamentally transformed service delivery across public and private institutions (Vial, 2019; Verhoef et al., 2021). Across diverse service-oriented sectors, this digital dependence reshapes how administrative processes are managed, information is distributed, and operational activities are coordinated across various departments. As reliance on digital technologies increases, scholarly attention has expanded beyond technology adoption to include the sustainability of digitally enabled service delivery.

Service delivery sustainability has become a critical organisational concern in environments characterised by operational uncertainty, rising stakeholder expectations, and continuous technological change (Chiwawa et al., 2021; Beducci et al., 2025). Institutions are expected not only to deliver services efficiently but also to maintain service continuity, reliability, responsiveness, and adaptability over time (Chiwawa et al., 2021). In many organisations, digital systems now support core operational activities such as communication, administration, customer engagement, information processing, and

decision-making (Burinskienė, 2025; Beducci et al., 2025). However, the effectiveness of these systems depends on employees' ability to utilise digital technologies effectively in executing operational tasks (Maulana et al., 2026; Rahmatiani et al., 2024).

Despite substantial investment in digital technologies, many organisations continue to experience challenges in sustaining service delivery. These challenges include service delays, operational inefficiencies, and reduced responsiveness to disruptions within digitally enabled service environments (Ezeugwu, 2025; Sukare & Abdullahi, 2025). While digital technologies can enhance service processes, their presence alone does not ensure sustainable service outcomes ((Ezeugwu, 2025). Organisations frequently deploy digital platforms without achieving corresponding improvements in service consistency, efficiency, and continuity (Sukare & Abdullahi, 2025; Harry & Tijjani, 2025; Omotayo et al., 2025).

The effectiveness of digital systems depends substantially on the capabilities of employees responsible for their utilisation. Inadequate workforce digital skills may limit system utilisation, reduce operational effectiveness, and constrain service outcomes. Conversely, strong digital capabilities enable employees to utilise digital systems effectively, minimise operational errors, and adapt to technological and procedural changes, thereby supporting service continuity and adaptability. Existing studies have largely focused on technology adoption, with limited attention to the workforce capabilities required to sustain service outcomes (Vial, 2019). In developing countries, inadequate training and low digital competence continue to hinder effective system utilisation and increase resistance to change (Bello & Hassan, 2022; Adegoke & Akinlabi, 2021). This study therefore examines the effect of workforce digital capability on service delivery sustainability.

### 1.1 Objectives of the Study

The main aim of this study is to examine the effect of workforce digital capability on service delivery sustainability. The specific objectives include to:
examine the influence of workforce digital skills on service delivery sustainability; and
determine the effect of workforce adaptability on service delivery sustainability.

### 1.2 Justification of the Study

This study is justified on theoretical, empirical, and practical grounds.

Theoretically, this study is anchored on Dynamic Capabilities Theory (Teece et al., 1997), which explains how organisations sustain performance by deploying, adapting, and reconfiguring capabilities in response to changing operational conditions. Within digitally enabled environments, workforce digital skills and workforce adaptability represent important capabilities that influence how effectively employees utilise digital technologies and respond to technological change. By examining the relationship between workforce digital capability and service delivery sustainability, this study provides empirical evidence on the relevance of Dynamic Capabilities Theory in explaining how workforce capabilities contribute to sustainable service outcomes.

Empirically, existing studies have examined digital transformation, technology adoption, and organisational performance across different sectors. However, the influence of workforce digital skills and workforce adaptability on service delivery sustainability has received comparatively less attention. Within the Nigerian higher education sector, empirical evidence on how this workforce capabilities contribute to sustainable service outcomes remains limited. This study contributes to the literature by providing empirical evidence on the relationship between workforce digital capability and service delivery sustainability.

Practically, the benefits derived from digital infrastructure investments depend not only on the availability of technology but also on the digital skills and adaptability of the workforce. Workforce digital capability influences the effective utilisation of digital systems and the sustainability of service delivery. By examining the influence of workforce digital skills and workforce adaptability on service delivery sustainability, this study will provide evidence to support workforce development, training, and capacity-building initiatives. The findings will assist university administrators, human resource managers, and government agencies in formulating strategies for strengthening workforce capability and sustaining service delivery within digitally enabled environments.

### 1.3 Scope of the Study

This study examined how workforce digital skills and workforce adaptability influence service delivery sustainability. The study focused on workforce digital skills and workforce adaptability and did not examine other organisational factors such as digital infrastructure, leadership support, or organisational culture. The study was conducted within educational institutions in Ilorin, Kwara State, Nigeria. Data were collected from academic and administrative staff of

universities in Ilorin that have been in operation for more than ten years, specifically the University of Ilorin and Al-Hikmah University. These institutions were selected because they represent both public and private university settings within Ilorin, thereby providing variation in organisational context. A quantitative, cross-sectional survey design was used.

## 2. Literature Review

### 2.1 Workforce Digital Capability

Workforce digital capability has become increasingly important within contemporary organisational environments due to the growing reliance on digital technologies for operational activities and service delivery processes. Organisations now depend on digital systems for communication, information management, decision-making, customer engagement, and operational coordination. Consequently, employees are expected to possess the competencies required to effectively utilize digital technologies within their work environments (Sousa & Rocha, 2019; Verhoef et al., 2021).

Workforce digital capability refers to the ability of employees to effectively utilize digital technologies, adapt to technological changes, and apply digital competencies to support organisational operations and service processes (Van Laar et al., 2020). It encompasses employees' digital literacy, digital communication competence, technological adaptability, problem-solving ability, and continuous digital learning orientation. Workforce digital capability enables employees to efficiently engage with digital platforms, respond to operational changes, and support digitally enabled organisational processes.

The growing importance of workforce digital capability is closely linked to the expansion of digital transformation initiatives across organisations. While organisations continue to invest heavily in digital infrastructure and technological systems, the effectiveness of these technologies depends significantly on the capability of employees to utilize them effectively (Vial, 2019). Employees therefore serve as the operational link between digital systems and organisational outcomes. Where workforce digital capability is weak, organisations often experience poor system utilization, operational inefficiencies, reduced responsiveness, and inconsistent service delivery.

### 2.2 Workforce Digital Skills

Workforce digital skills refer to the knowledge, competencies, and confidence of employees to effectively use digital technologies in carrying out organisational tasks. This includes technical proficiency, digital problem-solving ability, adaptability, and continuous skill upgrading (Van Laar et al., 2020). Research consistently shows that digital transformation initiatives fail when organisations invest heavily in technology but neglect human capability development. Employees act as the primary interface between digital systems and service delivery outcomes; therefore, workforce digital skills are a critical driver of transformation success (Sousa & Rocha, 2019). In the context of service delivery sustainability, employees with strong digital skills are more likely to use systems effectively, minimise errors, improve service processes, and respond to technological changes (Cyril-Nwuche, 2025).

### 2.3 Workforce Adaptability

Workforce adaptability refers to the capacity of employees to adjust their skills, behaviours, and attitudes in response to technological change and evolving work demands. Adaptable employees are more open to learning new systems, experimenting with digital tools, and coping with uncertainty associated with digital transformation (Pulakos et al., 2000). Adaptability is particularly important in digital environments characterised by rapid technological change. It enables organisations to continuously reconfigure human resources in line with evolving digital demands, thereby supporting service continuity and long-term sustainability (Teece et al., 1997).

### 2.4 Service Delivery Sustainability

Service delivery sustainability refers to an organisation's enduring capacity to design, deliver, and continuously improve services in a manner that ensures consistent quality, efficient use of resources, operational continuity, and adaptive responsiveness to environmental, technological, and institutional changes over time (Bansal & DesJardine, 2014). It reflects a dynamic organisational capability that integrates four dimensions:

**Service quality consistency:** The degree to which digitally enabled organisations maintain uniform standards of quality, reliability, and accuracy over time (Parasuraman et al., 1988).
**Operational efficiency:** The ability to deliver services using optimal levels of time, cost, and resources without compromising quality (Slack et al., 2016).
**Operational resilience:** The capacity of service systems to absorb shocks, adapt to disruptions, and recover functionality without permanent degradation (Lengnick-Hall et al., 2011).
**Institutional adaptability:** The organisation's ability to modify service processes, structures, and delivery

models in response to changing environmental conditions (Teece, 2018).

## 2.5 Theoretical Framework

Two theoretical perspectives are relevant for this study: the Resource-Based View (RBV) and Dynamic Capabilities Theory (DCT).

**Resource-Based View (RBV):** RBV posits that organisational resources that are valuable, rare, inimitable, and non-substitutable can generate sustained competitive advantage (Barney, 1991). From this perspective, workforce digital skills represent a valuable human resource that can improve service delivery outcomes. However, RBV is largely static; it explains *what* resources matter but does not explain *how* organisations adapt these resources to changing environments. In service settings where digital technologies and user expectations evolve rapidly, the mere possession of digital skills is insufficient without the ability to continuously renew and reconfigure those skills.

Dynamic Capabilities Theory (Teece et al., 1997) explains how organisations sustain competitive advantage in rapidly changing environments. The theory posits three core processes: sensing (identifying opportunities), seizing (mobilising resources to capture opportunities), and transforming (continuous renewal). Workforce digital skills and workforce adaptability underpin all three processes. Employees with strong digital skills sense technological opportunities; those with high adaptability seize them by adopting new tools; and together they enable continuous transformation of work processes. Thus, workforce digital skills and adaptability are micro-foundations of dynamic capabilities that directly enable service delivery sustainability (Eisenhardt & Martin, 2000).

This study adopts Dynamic Capabilities Theory (DCT) as its primary theoretical framework because it provides a suitable basis for explaining how organisations sustain performance in changing digital environments. While the Resource-Based View (RBV) recognises the value of organisational resources, DCT emphasises the ability to deploy, adapt, and reconfigure those resources in response to evolving operational conditions (Teece et al., 1997). This perspective aligns with the study's focus on workforce digital skills and workforce adaptability, as these capabilities influence how employees utilise digital technologies and respond to technological change. Accordingly, DCT provides an appropriate theoretical lens for examining the relationship between workforce digital capability and service delivery sustainability.

## 2.6 Empirical Review

Existing empirical studies have established that workforce digital capability significantly influences organisational effectiveness, employee performance, operational efficiency, and digital transformation outcomes across different institutional contexts. Nwajei and Obieze (2025) investigated the impact of digital transformation on human capital development in public tertiary institutions in Delta State, Nigeria. Employing a descriptive survey design, the study collected data from 286 academic and non-academic staff using structured questionnaires. Data were analysed using descriptive statistics and linear regression analysis through SPSS version 26. The findings revealed that digital infrastructure adoption and digital skills development significantly influenced human capital development in public tertiary institutions. The authors concluded that digital transformation initiatives become more effective when technological investment is complemented with workforce digital capability development.

Dao et al. (2025) examined the relationship between digital workforce training, employee motivation, job satisfaction, digital behaviour, and employee performance among small and medium enterprises in Vietnam. Using a quantitative research approach, the study collected survey data from 497 employees and analysed the data using Structural Equation Modelling (SEM). The findings showed that digital workforce training significantly improved employee motivation, digital adaptability, and employee performance. The study concluded that continuous workforce digital capability development enhances organisational effectiveness and long-term operational sustainability.

Nyale et al. (2025) conducted a systematic review on the digital skills landscape, focusing on academic programmes, industry demands, and graduate competencies. Using a systematic literature review methodology and narrative synthesis approach, the study identified significant gaps between digital skill requirements in organisations and competencies possessed by graduates. The findings revealed that inadequate digital competence and limited practical digital exposure negatively affect workforce readiness and organisational effectiveness. The study concluded that institutions must strengthen digital capability development to support future workforce sustainability.

O'Sullivan et al. (2019) examined digital dexterity as a sustainable model for building essential workforce skills across Australian universities. Using a practitioner-led collaborative approach involving fourteen universities, the study developed a digital

dexterity framework aimed at improving workforce digital capability and long-term institutional sustainability. The findings showed that digital dexterity enhances employee adaptability, continuous learning, and sustainable operational performance. The authors concluded that workforce digital capability is essential for sustaining digitally enabled institutional operations.

Lopes, Sargento, and Farto (2023) investigated digital skills training among public sector workers in Portugal. Using survey data collected from 573 public employees, the study employed probabilistic regression analysis and descriptive statistical techniques to analyse the relationship between workforce digital literacy and training participation. The findings showed that workers possessed relatively low levels of digital knowledge and limited participation in digital training programmes. However, most respondents demonstrated willingness to participate in future digital training initiatives. The study concluded that workforce digital capability development is essential for successful digital transformation and sustainable public service delivery.

Udegbunam, Igbokwe-Ibeto, and Nwafor (2023) analysed the challenges and opportunities associated with digital transformation in the Nigerian public service. Using a qualitative methodology guided by the Technology Acceptance Model (TAM), the study identified several barriers to effective digital transformation, including inadequate digital skills, resistance to change, weak infrastructure, and insufficient workforce readiness. The findings showed that workforce digital capability remains critical for improving public service delivery and operational effectiveness. The authors concluded that workforce digital training and institutional support mechanisms are necessary for sustainable digital transformation.

Aina, Uwitonze, and Rusu (2022) investigated barriers to digital transformation among small and medium enterprises in Nigeria. Using an exploratory qualitative approach, the study identified twenty-three barriers affecting digital transformation processes, including inadequate workforce digital competence and limited digital adaptability. The findings revealed that digital capability deficiencies significantly constrain organisational digital transformation efforts. The authors concluded that organisations in developing economies require stronger workforce digital capability development to achieve sustainable digital transformation outcomes.

Alawiye et al. (2025) examined workforce adaptability and skill development in the age of automation and technological disruption. Using a comprehensive review of empirical studies and strategic workforce development practices, the study found that reskilling, upskilling, and continuous learning significantly improve workforce adaptability and organisational competitiveness. The authors concluded that organisations must invest in workforce adaptability and digital capability development to sustain operational performance within rapidly evolving technological environments.

Abalora et al. (2024) examined human-AI collaboration and workforce skill adaptation within digitally transforming workplaces in the Philippines. Using a mixed-method approach involving 153 employees, the study employed descriptive statistics and Kruskal-Wallis H-Test analysis to evaluate employee perceptions regarding AI integration, digital skill development, and future work adaptation. The findings revealed that workforce digital adaptability significantly influences employee perceptions of digital transformation and future workplace readiness. The study concluded that digital capability development remains essential for sustaining workforce effectiveness within digitally evolving environments.

Sousa and Rocha (2019) investigated the role of digital learning in developing workforce capabilities for organisational digital transformation. Using conceptual and empirical analysis, the study found that workforce digital learning significantly enhances employee adaptability, organisational efficiency, and long-term digital transformation success. The authors concluded that workforce digital capability serves as a strategic operational resource supporting sustainable organisational performance.

Van Laar et al. (2020) examined determinants of twenty-first century digital skills among working professionals. Using large-scale survey data and statistical analysis, the study identified digital literacy, problem-solving ability, communication competence, and technological adaptability as essential workforce capabilities for digitally evolving organisations. The findings showed that workforce digital capability significantly improves employee effectiveness and operational responsiveness.

Verhoef et al. (2021) explored digital transformation processes and organisational adaptation using a multidisciplinary research approach. The study found that workforce capability development remains central to sustaining digital transformation outcomes and operational effectiveness. The authors concluded that organisations require digitally competent employees to maximize the benefits of digital technologies and sustain service delivery processes.

Vial (2019) reviewed existing literature on digital transformation and organisational change. Using a systematic review methodology, the study revealed

that workforce capability and employee adaptability significantly influence the success of digital transformation initiatives. The study concluded that organisations must prioritise workforce digital capability development to sustain digitally enabled operational systems.

Bello and Hassan (2022) examined digital competencies and organisational effectiveness in Nigerian institutions. Using a quantitative survey approach, the study found that employee digital competence positively influences organisational effectiveness and operational performance. The authors concluded that workforce digital capability contributes significantly to improving service delivery processes.

Ojo (2023) investigated digital transformation and service efficiency in higher education institutions. Using survey data from educational institutions, the study found that workforce digital competence significantly enhances service efficiency, operational responsiveness, and digital system utilization. The study concluded that workforce digital capability remains essential for sustaining efficient digital service delivery within educational institutions.

### 2.7 Literature Gap

Existing studies have extensively examined digital transformation, workforce digital training, employee adaptability, organisational effectiveness, and digital capability development across different organisational contexts. Several studies have also established that workforce digital competence contributes positively to employee performance, operational efficiency, and organisational competitiveness (Dao et al., 2025; Lopes et al., 2023; Verhoef et al., 2021). Similarly, studies conducted within Nigerian institutions have emphasized the importance of digital competencies and digital transformation for organisational effectiveness and human capital development (Bello & Hassan, 2022; Nwajei & Obieze, 2025).

However, limited empirical attention has been given to workforce digital capability as a determinant of service delivery sustainability. Most existing studies focus primarily on digital transformation, employee performance, organisational competitiveness, or human capital development, while insufficient attention has been given to how workforce digital skills and workforce adaptability collectively influence sustainable service delivery. Furthermore, many studies emphasize technological systems and infrastructure while paying limited attention to employee digital capability as an operational resource supporting long-term service sustainability. This study therefore addresses this gap by examining the effect of workforce digital capability, specifically workforce digital skills and workforce adaptability, on service delivery sustainability among universities in Ilorin.

## 3. Research Methodology

This study adopted a cross-sectional survey design. This design is appropriate for examining the influence of workforce digital skills and workforce adaptability on service delivery sustainability because it allows data collection at a single point in time, which is feasible and cost-effective for multiple regression analysis (Creswell & Creswell, 2018; Saunders et al., 2019). The target population for this study comprises academic and administrative staff (Senior Admin, ICT & Technical staff) of universities in Ilorin that have been in operation for more than ten years. These institutions are the University of Ilorin (established 1975) and Al-Hikmah University (established 2005). Ilorin was selected because it hosts both public and private universities with diverse digital adoption levels, ensuring geographical feasibility and access to a concentrated pool of respondents who regularly use digital systems for service delivery. The ten-year operational criterion ensures that the selected institutions have attained sufficient organisational maturity, digital infrastructure, and operational experience to provide meaningful insights into service delivery sustainability.

**Table 1:** Universities in Ilorin (Established >10 Years)

| University | Year Established | Years of Operation (as of 2026) | Academic Staff | Non-academic Staff **(Senior Admin, ICT & Technical staff)** | Total Staff |
|---|---|---|---|---|---|
| University of Ilorin | 1975 | 51 years | 1,951 | 651 | 2602 |
| Al-Hikmah University | 2005 | 21 years | 237 | 124 | 361 |
| Total | | | 2188 | 775 | 2963 |

*(Source: Internal institutional records, 2026)*

The sample size for this study was determined using the Krejcie and Morgan (1970) table. For a total population of 2,963 staff across the University of Ilorin and Al-Hikmah University, the minimum required sample was 340 at 95% confidence level and 5% margin of error.

**Table 2:** Sample Size Allocation

| University | Academic Staff | Non-Academic Staff | Total Sample |
|---|---|---|---|
| University of Ilorin | 224 | 75 | **299** |
| Al-Hikmah University | 27 | 14 | **41** |
| **Total** | **251** | **89** | **340** |

Using proportionate allocation, the sample was distributed across strata based on each stratum's population size. From the University of Ilorin, 299 participants were drawn (224 academic staff and 75 non-academic staff). From Al-Hikmah University, 41 participants were drawn (27 academic staff and 14 non-academic staff). Participants were selected using stratified random sampling, with strata defined by staff category (academic vs. non-academic) and institution. This method ensured representation across different staff roles and institutions, reducing sampling bias and increasing generalisability (Lohr, 2022).

To account for potential missing data, incomplete responses, or unusable questionnaires, the initial sample size was increased by 10%. This adjustment is a standard practice in survey research to ensure that the effective sample size remains adequate for statistical analysis after data cleaning (Saunders et al., 2019; Hair et al., 2021). The minimum required sample size based on Krejcie and Morgan (1970) was 340. To accommodate anticipated attrition due to incomplete or invalid responses, an additional 34 participants (10% of the minimum sample) were included, bringing the total distributed sample to 374.

A structured, self-administered questionnaire was used as the data collection instrument. It measured workforce digital skills (8 items adapted from Van Laar et al., 2020), workforce adaptability (6 items adapted from Pulakos et al., 2000), and service delivery sustainability (16 items – four per dimension: service quality consistency, operational efficiency, operational resilience, institutional adaptability – adapted from Bansal & DesJardine, 2014; Slack et al., 2016). All items used a 5-point Likert scale. Using validated scales enhanced content validity and reliability. The questionnaire was pilot-tested with 30 respondents from a non-sampled university in Ilorin to assess clarity, readability, and internal consistency, thereby reducing measurement error (DeVellis, 2017).

Data were analysed using multiple regression analysis with SPSS version 26. Preliminary analyses included descriptive statistics, reliability tests (Cronbach's alpha), and validity assessment. Multiple regression was used to test the influence of workforce digital skills (digital literacy, digital communication skills, digital problem-solving ability) and workforce adaptability (technological adaptability, continuous learning orientation, work process flexibility) on service delivery sustainability. The enter method was used for both regression models. Significance was tested at $p < 0.05$. Multiple regression was appropriate for examining the individual and combined effects of the predictor variables on the dependent variable (Hair et al., 2021).

Ethical approval was obtained from the relevant institutional review board. Participation was voluntary; informed consent was obtained from all respondents. Data were anonymised, stored on password-protected devices, and used only for academic purposes. Participants were informed that they could withdraw at any time without penalty. Adhering to these guidelines protected participant rights, ensured confidentiality, and maintained the integrity of the research process

## 4. Data Presentation and Discussion of Findings

### 4.1 Demographic Characteristics of Respondents

A total of 340 respondents participated in the study, representing academic and non-academic staff from the University of Ilorin and Al-Hikmah University in Ilorin, Nigeria. Table 1 presents the demographic profile of the sample.

**Table 3:** Demographic Characteristics of Respondents

| Characteristic | Category | Frequency (n) | Percentage (%) |
|---|---|---|---|
| **Gender** | Male | 186 | 54.7 |
| | Female | 154 | 45.3 |
| **University** | University of Ilorin | 299 | 87.9 |
| | Al-Hikmah University | 41 | 12.1 |
| **Staff Category** | Academic | 251 | 73.8 |
| | Non-academic | 89 | 26.2 |
| **Years of Service** | Less than 5 years | 68 | 20.0 |
| | 5 – 10 years | 112 | 32.9 |
| | 11 – 15 years | 95 | 27.9 |
| | More than 15 years | 65 | 19.1 |

| | | | |
|---|---|---|---|
| **Educational Qualification** | Bachelor's degree | 102 | 30.0 |
| | Master's degree | 156 | 45.9 |
| | Doctorate degree | 62 | 18.2 |
| | Other (e.g., HND) | 20 | 5.9 |
| **Digital Tool Usage Frequency** | Daily | 198 | 58.2 |
| | Weekly | 88 | 25.9 |
| | Monthly | 34 | 10.0 |
| | Rarely | 20 | 5.9 |

*(Researcher's computation, 2026)*

The sample had a slight male majority (54.7%). Staff from the University of Ilorin constituted 87.9% of the sample, reflecting its larger population, while Al-Hikmah University staff represented 12.1%. Academic staff made up 73.8% of respondents. Most respondents had between 5 and 10 years of service (32.9%), followed by those with 11–15 years (27.9%). The majority held a Master's degree (45.9%). More than half (58.2%) used digital tools daily, indicating regular engagement with digital systems for service delivery. The demographic profile shows that the sample reflects the actual population distribution of the two universities, with proportionate representation across staff categories. This supports the representativeness of the sample and the internal validity of the findings.

**Table 4:** Descriptive Statistics of Key Constructs

| Variables | N | Mean | Std. Deviation |
|---|---|---|---|
| Digital Literacy | 340 | 4.12 | 0.71 |
| Digital Communication Skills | 340 | 4.05 | 0.68 |
| Digital Problem-Solving Ability | 340 | 4.18 | 0.73 |
| Technological Adaptability | 340 | 4.09 | 0.69 |
| Continuous Learning Orientation | 340 | 4.16 | 0.72 |
| Work Process Flexibility | 340 | 3.97 | 0.75 |
| Service Delivery Sustainability | 340 | 4.21 | 0.66 |

*(Researcher's computation, 2026)*

The descriptive statistics revealed that all variables recorded mean scores above 3.90, indicating a generally high perception of workforce digital capability and service delivery sustainability among respondents. Digital problem-solving ability recorded the highest mean score (Mean = 4.18, SD = 0.73), suggesting that employees demonstrated relatively strong capacity to utilize digital systems in resolving operational challenges. Continuous learning orientation also recorded a high mean score (Mean = 4.16, SD = 0.72), indicating that employees were positively disposed toward continuous digital learning and capability improvement. Service delivery sustainability recorded a mean score of 4.21 (SD = 0.66), implying that respondents perceived service delivery processes within their institutions as relatively sustainable, reliable, and operationally effective. The relatively low standard deviation values across all variables indicate consistency in respondents' opinions. This suggests that workforce digital capability remains an important operational factor influencing sustainable service delivery.

**Table 5:** Reliability and Validity Analysis

| Constructs | Cronbach's Alpha | Composite Reliability (CR) | Average Variance Extracted (AVE) |
|---|---|---|---|
| Digital Literacy | 0.841 | 0.872 | 0.631 |
| Digital Communication Skills | 0.826 | 0.861 | 0.608 |
| Digital Problem-Solving Ability | 0.857 | 0.889 | 0.667 |
| Technological Adaptability | 0.833 | 0.868 | 0.622 |
| Continuous Learning Orientation | 0.846 | 0.880 | 0.648 |
| Work Process Flexibility | 0.811 | 0.847 | 0.587 |
| Service Delivery Sustainability | 0.882 | 0.907 | 0.709 |

*(Researcher's computation, 2026)*

The reliability analysis showed that all constructs exceeded the recommended Cronbach's Alpha threshold of 0.70, indicating satisfactory internal consistency reliability. Service delivery sustainability recorded the highest reliability coefficient ($\alpha = 0.882$), while work process flexibility recorded the lowest coefficient ($\alpha = 0.811$), which still exceeded the acceptable threshold. Similarly, all Composite Reliability (CR) values exceeded the recommended threshold of 0.70, confirming construct reliability. In addition, all Average Variance Extracted (AVE) values exceeded 0.50, indicating adequate convergent validity. These findings imply that the measurement scales used in the study were reliable and valid for examining the impact of workforce digital capability on service delivery sustainability.

### 4.2 Analysis of Research Objective I

The first objective aims to examine the influence of workforce digital skills on service delivery sustainability. This objective is analysed thus:

**Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.802 | 0.643 | 0.639 | 0.396 |

*(Researcher's computation, 2026)*

ANOVAa

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 80.18 | 3 | 26.73 | 202.6 | 0.000b |
| Residual | 44.53 | 336 | 0.1325 | | |
| Total | 124.71 | 339 | | | |

*(Researcher's computation, 2026)*
a. Dependent Variable: Service Delivery Sustainability
b. Predictors: (Constant), Digital Literacy, Digital Communication Skills, Digital Problem-Solving Ability

Coefficientsa

| Model | Unstandardized Coefficients B | Std. Error | Standardized Coefficients Beta | t | Sig. |
|---|---|---|---|---|---|
| (Constant) | 1.083 | 0.192 | | 5.641 | 0.000 |
| Digital Literacy | 0.291 | 0.048 | 0.302 | 6.063 | 0.013 |
| Digital Communication Skills | 0.228 | 0.046 | 0.241 | 4.957 | 0.022 |
| Digital Problem-Solving Ability | 0.374 | 0.049 | 0.389 | 7.633 | 0.002 |

*(Researcher's computation, 2026)*
a. Dependent Variable: Service Delivery Sustainability

The regression results showed that workforce digital skills significantly influenced service delivery sustainability ($F = 202.6$, $p < 0.05$), explaining 64.3% of its variance ($R^2 = 0.643$). Digital literacy ($\beta = 0.302$), digital communication skills ($\beta = 0.241$), and digital problem-solving ability ($\beta = 0.389$) all had significant positive effects on service delivery sustainability.

The findings suggest that employees' ability to effectively use digital systems, communicate digitally, and resolve operational problems enhances sustainable service delivery. The findings support Nwajei and Obieze (2025) and Dao et al. (2025), who found that digital capability development improves organisational effectiveness and employee performance. The significant effects of digital literacy and digital problem-solving ability also align with Lopes et al. (2023), Van Laar et al. (2020), and Sousa and Rocha (2019), who identified digital competence as an important driver of organisational responsiveness and operational effectiveness. Similarly, Verhoef et al. (2021), Vial (2019), and Bello and Hassan (2022) established that workforce digital capability enhances operational coordination, service continuity, and organisational effectiveness.

### 4.3 Analysis of Research Objective II

The second objective examines the influence of workforce adaptability on service delivery sustainability. This objective is analysed thus:

**Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | 0.764 | 0.584 | 0.580 | 0.427 |

*(Researcher's computation, 2026)*

Anovaa

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Regression | 72.83 | 3 | 24.28 | 157.66 | 0.000b |
| Residual | 51.88 | 336 | 0.154 | | |
| Total | 124.71 | 339 | | | |

*(Researcher's computation, 2026)*
a. Dependent Variable: Service Delivery Sustainability
b. Predictors: (Constant), Technological Adaptability, Continuous Learning Orientation, Work Process Flexibility

Coefficientsa

| Model | Unstandardized Coefficients B | Std. Error | Standardized Coefficients Beta | t | Sig. |
|---|---|---|---|---|---|
| (Constant) | 1.296 | 0.208 | | 6.231 | 0.000 |
| Technological Adaptability | 0.338 | 0.051 | 0.351 | 6.627 | 0.001 |
| Continuous Learning Orientation | 0.276 | 0.049 | 0.298 | 5.633 | 0.012 |
| Work Process Flexibility | 0.214 | 0.047 | 0.227 | 4.553 | 0.033 |

*(Researcher's computation, 2026)*

a. Dependent Variable: Service Delivery Sustainability

The regression results showed that workforce adaptability significantly influenced service delivery sustainability ($F = 157.66$, $p < 0.05$), explaining 58.4% of its variance ($R^2 = 0.584$). Technological adaptability ($\beta = 0.351$), continuous learning orientation ($\beta = 0.298$), and work process flexibility ($\beta = 0.227$) all had significant positive effects on service delivery sustainability.

The findings indicate that employees' ability to adapt to technological changes, continuously improve digital competencies, and flexibly adjust work processes contributes significantly to sustainable service delivery. The findings support Dao et al. (2025), who found that workforce adaptability improves organisational performance and operational effectiveness. Similarly, Abalora et al. (2024) and Udegbunam et al. (2023) established that technological adaptability is important for sustaining digital transformation and service operations. The positive effect of continuous learning orientation also aligns with Alawiye et al. (2025) and O'Sullivan et al. (2019), who found that continuous learning enhances workforce adaptability and institutional effectiveness. Furthermore, the significant contribution of work process flexibility corroborates Sousa and Rocha (2019), Verhoef et al. (2021), and Vial (2019), who argued that workforce adaptability strengthens operational continuity and sustainable service delivery within digitally evolving environments.

## 5. Discussion of Findings

The findings revealed that workforce digital capability significantly influences service delivery sustainability. Specifically, workforce digital skills and workforce adaptability contributed positively to sustainable service delivery within digitally evolving organisational environments. This supports the argument that service sustainability depends not only on technological infrastructure but also on employees' ability to effectively use and adapt to digital systems.

Workforce digital skills showed significant positive effects on service delivery sustainability. Digital literacy, digital communication skills, and digital problem-solving ability all contributed significantly, with digital problem-solving ability recording the strongest influence. Employees who can resolve operational challenges using digital technologies contribute substantially to maintaining reliable and efficient service delivery. These findings align with Nwajei and Obieze (2025), Dao et al. (2025), and Van Laar et al. (2020), who established that digital skills and problem-solving competence improve institutional effectiveness and operational performance. The significant influence of digital communication skills also corroborates Verhoef et al. (2021) and Vial (2019), who emphasised that workforce digital capability enhances operational coordination and service continuity.

Workforce adaptability also significantly influenced service delivery sustainability. Technological adaptability, continuous learning orientation, and work process flexibility all demonstrated significant positive effects. Employees who adapt effectively to technological changes and continuously improve their competencies contribute positively to sustaining efficient service operations. These findings support Alawiye et al. (2025), Abalora et al. (2024), and Sousa and Rocha (2019), who found that continuous learning and adaptability enhance organisational competitiveness and long-term digital transformation success.

Overall, the findings provide stronger support for Dynamic Capabilities Theory while also aligning with the Resource-Based View, confirming that workforce digital capability is a critical operational resource for sustaining service delivery in contemporary digitally evolving environments.

## 6. Conclusion and Recommendations

This study examined the effect of workforce digital capability on service delivery sustainability. The findings revealed that workforce digital skills and workforce adaptability significantly contribute to sustaining reliable and efficient service delivery within digitally evolving organisational environments.

The study demonstrates that workforce digital capability constitutes a critical organisational capability for sustaining service delivery for sustaining service continuity, operational responsiveness, and organisational adaptability. The findings further indicate that sustainable service delivery depends not only on technological infrastructure but also on employees' ability to effectively utilize and adapt to digital systems.

The study therefore recommends continuous workforce digital training, digital upskilling, adaptability development, and technology-supported learning initiatives to strengthen long-term service delivery sustainability. Organisations should prioritize workforce digital capability development within broader digital transformation strategies to improve operational effectiveness and sustain digitally enabled service systems.

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