



Automation of administrative processes and institutional performance in Abubakar Tatari Ali Polytechnic, Bauchi, Bauchi state, Nigeria

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Abstract

The increasing adoption of digital technologies has transformed administrative systems across higher education institutions globally. Automation of administrative processes has emerged as a strategic mechanism for enhancing organizational efficiency, improving service delivery, ensuring records accuracy, and strengthening institutional performance. Despite growing investments in information and communication technology (ICT) in Nigerian tertiary institutions, empirical evidence on the effectiveness of administrative automation in state-owned polytechnics remains limited. This study examined the effect of automation of administrative processes on institutional performance in Abubakar Tatari Ali Polytechnic, Bauchi. Specifically, the study investigated the influence of automation on operational efficiency, service delivery, records management accuracy, and overall institutional performance. The study adopted a descriptive survey research design. The target population comprised academic and non-academic staff of the Polytechnic, while a sample of 248 respondents was selected using stratified random sampling. Data were collected through a structured questionnaire designed on a five-point Likert scale. The instrument was validated by experts in Public Administration and Measurement and Evaluation, while reliability was established using Cronbach's Alpha. Data were analyzed using descriptive statistics, Pearson Product Moment Correlation, and Multiple Regression Analysis at a 0.05 level of significance. The findings revealed that administrative automation has a statistically significant positive effect on operational efficiency, service delivery, records accuracy, and institutional performance. The regression analysis indicated that automation accounted for a substantial proportion of the variance in institutional performance. The study concludes that effective automation of administrative processes significantly enhances institutional effectiveness by reducing administrative delays, minimizing errors, facilitating timely decision-making, and improving staff productivity. It recommends increased investment in ICT infrastructure, continuous staff capacity development, integration of institutional information systems, strengthened cybersecurity mechanisms, and sustained management support for digital transformation initiatives. The study contributes to the growing body of knowledge on digital governance and provides evidence-based recommendations for improving administrative performance in Nigerian polytechnics.

Keywords: Administrative automation, institutional performance, operational efficiency, service delivery, records management, ICT, Polytechnic administration

Introduction

The rapid advancement of information and communication technology (ICT) has fundamentally transformed administrative systems across both public and private organizations worldwide. Organizations increasingly rely on automated systems to improve efficiency, reduce operational costs, enhance transparency, facilitate timely decision-making, and strengthen service delivery. Within higher education institutions, administrative automation has become an indispensable component of institutional management because of its ability to integrate various administrative functions into a unified digital environment (Laudon & Laudon, 2021) [18].

Globally, universities and polytechnics have shifted from traditional manual administrative procedures to technology-driven management systems capable of supporting academic and administrative operations. These automated systems include Enterprise Resource Planning (ERP), Student Information Systems (SIS), Human Resource Management Information Systems (HRMIS), Electronic Document Management Systems (EDMS), Financial Management Information Systems (FMIS), and Learning Management Systems (LMS). These technologies facilitate faster processing of institutional records, improve communication,

strengthen accountability, and enhance institutional governance (Brynjolfsson & McAfee, 2017) [7].

Administrative automation refers to the application of computer-based technologies to perform routine organizational activities with minimal manual intervention. It encompasses digital processing of admissions, student registration, payroll administration, procurement, budgeting, examination management, personnel administration, electronic correspondence, records management, and decision support systems (Davenport & Short, 2018) [10]. Automation enables institutions to eliminate repetitive tasks, reduce human errors, improve information accessibility, and enhance organizational productivity.

In higher education, effective administration determines the extent to which institutions successfully achieve their teaching, research, community service, and governance objectives. Administrative processes constitute the backbone of institutional management because they coordinate human resources, financial resources, academic records, procurement activities, student services, and institutional planning. Consequently, inefficiencies within administrative systems often translate into poor institutional performance, delays in service delivery, inaccurate records, financial leakages, and reduced stakeholder satisfaction (Richard *et al.*, 2009) [21].

The growing complexity of tertiary education administration has significantly increased the demand for digital transformation. Rising student enrolment, expanding academic programmes, increasing regulatory requirements, and growing expectations from students and government agencies have made manual administrative systems increasingly inefficient. Consequently, educational institutions worldwide have embraced automation as a strategic approach for improving institutional effectiveness (Featherman, 2023) [14].

The emergence of digital governance has further reinforced the importance of administrative automation in higher education. Digital governance involves the application of ICT to improve governance processes, strengthen transparency, enhance accountability, and promote evidence-based decision-making. Modern institutions increasingly rely on integrated digital platforms that allow administrators to access real-time information necessary for planning, budgeting, monitoring, and policy implementation (Elugbaju *et al.*, 2024) [13].

Despite these positive findings, empirical studies focusing specifically on state-owned polytechnics remain relatively scarce. Most existing studies have concentrated on universities, leaving a significant knowledge gap regarding the effectiveness of administrative automation within polytechnic education. Furthermore, contextual differences in institutional governance, funding arrangements, staff competencies, and infrastructural capacities necessitate institution-specific investigations capable of informing evidence-based policy decisions.

Statement of Problem

The contemporary higher education environment demands efficient, transparent, responsive, and technology-driven administrative systems capable of supporting effective institutional governance. However, many Nigerian tertiary institutions continue to depend partly on manual administrative procedures characterized by bureaucratic delays, duplication of responsibilities, poor records management, slow information dissemination, inadequate coordination, and low operational efficiency. These administrative shortcomings negatively affect institutional productivity, decision-making, accountability, and stakeholder satisfaction.

Despite increasing investments in information and communication technology by governments and institutional managements, evidence suggests that several public tertiary institutions still experience persistent administrative inefficiencies. Delays in student registration, transcript processing, examination management, staff documentation, payroll administration, procurement procedures, and communication continue to undermine institutional effectiveness. These challenges are often exacerbated by inadequate ICT infrastructure, insufficient technical expertise, unstable electricity supply, organizational resistance to technological change, and poor system integration (Olatunji, 2019; Adeyemi & Ojo, 2021) [2, 20].

Abubakar Tatars Ali Polytechnic, Bauchi, has introduced several automated administrative systems aimed at improving operational efficiency and enhancing institutional performance. Nevertheless, concerns persist regarding delays in administrative processes, inconsistencies in records management, limited integration among administrative units, and varying levels of ICT utilization

across departments. While management continues to invest in automation initiatives, there remains limited empirical evidence demonstrating the actual contribution of these systems to institutional performance.

Objectives of the Study

The main objective of this study is to examine the effect of automation of administrative processes on institutional performance in Abubakar Tatars Ali Polytechnic, Bauchi.

The specific objectives are to:

1. Determine the effect of administrative automation on operational efficiency in Abubakar Tatars Ali Polytechnic, Bauchi;
2. Examine the effect of administrative automation on service delivery in the Polytechnic;
3. Evaluate the effect of administrative automation on overall institutional performance.

Literature Review

1. Introduction

This chapter reviews existing literature relating to automation of administrative processes and institutional performance in higher education institutions. The review provides theoretical and empirical foundations for understanding how automation influences administrative efficiency and organizational effectiveness. Specifically, the chapter examines the concepts of administrative automation and institutional performance, reviews related theories underpinning technology adoption in organizations, analyzes empirical studies relevant to the study objectives, identifies the research gap, and presents the conceptual framework that guides the study.

The literature is organized to demonstrate the relationship between automation and institutional performance from both global and Nigerian perspectives. Emphasis is placed on the relevance of digital transformation within tertiary education administration, particularly in state-owned polytechnics where increasing demand for quality service delivery has intensified the need for efficient administrative systems.

2. Conceptual Review

2.1 Concept of Administrative Automation

Administrative automation refers to the application of information and communication technologies (ICT), software applications, databases, artificial intelligence, cloud computing, and digital platforms to execute organizational administrative tasks with minimal manual intervention. It involves replacing paper-based and manual administrative procedures with computerized systems capable of processing, storing, retrieving, analyzing, and disseminating information efficiently (Davenport & Short, 2018) [10].

According to Laudon and Laudon (2021) [18], administrative automation integrates people, technology, organizational procedures, and information resources to improve organizational productivity, facilitate decision-making, and enhance service delivery. The objective is not merely digitization of records but the complete transformation of organizational workflows into efficient electronic systems that improve institutional effectiveness.

Brynjolfsson and McAfee (2017) [7] describe administrative automation as one of the major drivers of organizational competitiveness in the digital age. They argue that

institutions adopting automated systems experience substantial improvements in productivity because routine administrative activities become faster, more accurate, transparent, and cost-effective.

Administrative automation has evolved considerably over the past three decades. Early automation primarily involved computerization of individual office activities such as word processing, payroll preparation, and spreadsheet calculations. Contemporary automation, however, integrates entire organizational functions through Enterprise Resource Planning (ERP), Human Resource Information Systems (HRIS), Student Information Systems (SIS), Financial Management Information Systems (FMIS), Electronic Document Management Systems (EDMS), cloud computing technologies, artificial intelligence, and data analytics (Featherman, 2023) [14].

Within tertiary institutions, administrative automation encompasses virtually every aspect of institutional management. These include admissions processing, student registration, academic records management, staff recruitment, payroll administration, procurement, budgeting, inventory control, examination management, transcript processing, communication systems, library services, hostel allocation, alumni management, and institutional planning.

Modern administrative automation possesses several distinguishing characteristics. First, it facilitates real-time information processing, allowing administrators to obtain accurate institutional data whenever required. Second, it supports centralized database management, ensuring consistency and integrity of organizational information. Third, it minimizes human errors commonly associated with manual record keeping. Fourth, it strengthens transparency and accountability through automated audit trails. Finally, it enhances institutional responsiveness by reducing administrative delays and improving communication among departments (Elugbaju *et al.*, 2024) [13].

The increasing adoption of automation has significantly transformed institutional governance

Human Resource Management Information Systems

HRMIS automates staff recruitment, promotion, leave administration, payroll processing, pension management, attendance monitoring, performance appraisal, and personnel record management.

Financial Management Systems

Financial automation facilitates budgeting, revenue collection, expenditure control, payroll administration, procurement management, financial reporting, auditing, and compliance with financial regulations.

Electronic Document Management Systems

Electronic document management enables institutions to digitize files, correspondence, circulars, reports, policy documents, minutes of meetings, and archival records for easy retrieval and secure storage.

Communication Management Systems

Modern institutions increasingly rely on institutional emails, online portals, mobile applications, video conferencing platforms, and collaborative software to improve communication between management, staff, students, and external stakeholders.

Decision Support Systems

Decision Support Systems (DSS) utilize institutional databases and analytics to assist administrators in planning, forecasting, budgeting, performance evaluation, and policy formulation.

2.2 Concept of Institutional Performance

Institutional performance refers to the extent to which an organization achieves its predetermined objectives through effective utilization of available human, financial, technological, and material resources (Richard *et al.*, 2009) [21].

In higher education, institutional performance extends beyond academic achievements to include administrative efficiency, financial sustainability, staff productivity, service quality, stakeholder satisfaction, innovation, governance effectiveness, and institutional reputation.

Featherman (2023) [14] argues that institutional performance has become increasingly multidimensional because modern universities and polytechnics operate in highly competitive environments where stakeholders expect efficient services supported by digital technologies.

Institutional performance can therefore be evaluated using quantitative and qualitative indicators including:

1. speed of administrative processes;
2. quality of service delivery;
3. staff productivity;
4. records accuracy;
5. decision-making efficiency;
6. financial accountability;
7. customer satisfaction;
8. resource utilization;
9. institutional innovation;
10. organizational responsiveness.

Efficient administration remains one of the strongest determinants of institutional performance because administrative units coordinate virtually every organizational activity.

2.3 Administrative Automation and Service Delivery

Service delivery has become one of the most important indicators of institutional effectiveness in higher education. It refers to the extent to which an institution provides timely, efficient, accessible, reliable, and satisfactory services to students, staff, government agencies, and other stakeholders. Modern tertiary institutions increasingly rely on automated administrative systems to improve the speed, quality, and consistency of service delivery. The adoption of electronic registration systems, online admissions, computerized examination processing, digital payment platforms, and electronic communication has significantly transformed how services are delivered across higher education institutions (Laudon & Laudon, 2021) [18].

Several empirical studies have demonstrated that administrative automation significantly improves service delivery. Chen and Lu (2024) [8] examined the role of digital technologies in public service delivery and found that automation reduced service delays, increased transparency, improved accountability, and enhanced citizen satisfaction. Their study concluded that organizations that successfully integrate digital technologies into administrative processes consistently achieve better service outcomes than those relying on traditional manual procedures.

Yusuf and Ibrahim (2024) ^[26] investigated educational service delivery in Nigerian universities using a survey research design involving administrative staff and students across selected federal universities. The study employed descriptive statistics and multiple regression analysis. The findings revealed that computerized administrative systems significantly improved admission processing, transcript issuance, examination administration, and communication between university management and students. However, inadequate ICT infrastructure and inconsistent electricity supply were identified as major constraints affecting service quality.

Featherman (2023) ^[14], in a comprehensive study on digital transformation in higher education institutions, reported that institutions adopting integrated administrative management systems experienced shorter waiting periods for administrative services, faster response to student requests, and greater stakeholder satisfaction. The study further established that digital transformation enhances institutional competitiveness by improving administrative responsiveness.

2.4 Administrative Automation and Records Management Accuracy

Records constitute one of the most valuable organizational assets because they provide information required for planning, decision-making, accountability, monitoring, evaluation, and institutional memory. Effective records management ensures that accurate information is available whenever needed by institutional managers and stakeholders. Administrative automation has fundamentally transformed records management through computerized databases, electronic document management systems, cloud storage, and integrated institutional information systems (Davenport & Short, 2018) ^[10].

Richard *et al.* (2009) ^[21] argued that institutional performance depends significantly on the quality, accuracy, accessibility, and reliability of organizational information. Institutions maintaining accurate records are better positioned to formulate effective policies, allocate resources efficiently, monitor organizational performance, and satisfy regulatory requirements.

Adeyemi and Ojo (2021) ^[2] examined ICT adoption in Nigerian higher education institutions and found that automated record management significantly reduced errors associated with student records, payroll administration, personnel files, examination processing, and financial reporting. The study reported that electronic databases enhanced data security, reduced duplication, and facilitated rapid retrieval of institutional information.

Davenport and Short (2018) ^[10] emphasized that computerized databases eliminate many human errors associated with manual record keeping while providing institutions with reliable information for evidence-based decision-making. They further noted that automation improves institutional accountability by ensuring that records remain accurate, complete, secure, and easily retrievable.

Elugbaju *et al.* (2024) ^[13] similarly found that institutions adopting integrated digital governance systems experienced remarkable improvements in records management because administrative data became centrally coordinated across departments. Their study concluded that centralized

databases significantly improve organizational planning and institutional transparency.

Berezi (2024) ^[6] observed that modernization of educational facilities, including digital records management infrastructure, contributes significantly to institutional excellence. According to the study, institutions with computerized records management systems experience fewer incidences of misplaced documents, missing student files, payroll discrepancies, and examination errors.

Yusuf and Ibrahim (2024) ^[26] equally reported that electronic records management improved administrative efficiency within Nigerian universities by facilitating timely retrieval of student records, examination results, staff information, and financial documents. However, the study identified inadequate cybersecurity measures as an emerging challenge requiring institutional attention.

2.5 Administrative Automation and Institutional Performance

Institutional performance represents the ultimate outcome of effective organizational management. It reflects the degree to which institutions achieve their strategic objectives through efficient utilization of available resources. Administrative automation has increasingly become an important determinant of institutional performance because it improves operational efficiency, strengthens service delivery, enhances records management, and supports evidence-based decision-making (Richard *et al.*, 2009) ^[21].

Brynjolfsson and McAfee (2017) ^[7] demonstrated that digital transformation substantially improves organizational productivity through automation of routine administrative processes. Their study found that organizations embracing digital technologies consistently outperform those relying on manual administrative systems.

Featherman (2023) ^[14] similarly reported that higher education institutions adopting integrated administrative technologies recorded higher institutional rankings, improved stakeholder satisfaction, greater financial efficiency, and enhanced organizational competitiveness. The study concluded that digital transformation has become indispensable for institutional sustainability.

Kim (2021) ^[17] examined changing management paradigms in public administration and found that digital governance significantly improves institutional adaptability, responsiveness, and administrative effectiveness. According to the study, organizations embracing technology demonstrate stronger institutional resilience in rapidly changing environments.

Adeyemi and Ojo (2021) ^[2] found a statistically significant positive relationship between ICT adoption and institutional performance in Nigerian universities. Regression analysis indicated that automation explained a substantial proportion of improvements in administrative efficiency, staff productivity, financial accountability, and service quality.

Research Methodology

This study adopted a descriptive survey research design to examine the effect of automation of administrative processes on institutional performance in Abubakar Tatari Ali Polytechnic, Bauchi. The descriptive survey design was considered appropriate because it enables the researcher to obtain quantitative data from respondents regarding their perceptions and experiences with administrative automation

without manipulating the study variables (Creswell & Creswell, 2023)^[9].

The study was conducted at Abubakar Tatari Ali Polytechnic, Bauchi, Bauchi State, Nigeria. The target population comprised all academic and non-academic staff of the institution who are directly involved in the use and implementation of automated administrative systems. The total staff population was estimated at 650 employees.

Using Yamane's (1967)^[25] sample size determination formula at a 5% level of precision, a sample size of 248 respondents was obtained. A stratified random sampling technique was employed to ensure proportional representation of both academic and non-academic staff, after which simple random sampling was used to select respondents within each stratum.

Primary data were collected through a structured questionnaire developed from the objectives of the study and relevant literature. The questionnaire consisted of two sections. Section A elicited demographic information, while Section B contained items measuring automation of administrative processes, operational efficiency, service delivery, records management accuracy, and institutional performance using a five-point Likert scale ranging from Strongly Agree (5) to Strongly Disagree (1).

The instrument was subjected to face and content validity by experts in Public Administration and Measurement and Evaluation. A pilot study involving 30 staff members of another state-owned tertiary institution was conducted to determine the reliability of the instrument. Cronbach's Alpha coefficients for the study variables ranged from 0.81 to 0.88, indicating satisfactory internal consistency (Hair *et al.*, 2022)^[15].

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) Version 27. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize respondents' characteristics and responses. Pearson Product Moment Correlation was employed to determine the relationship between administrative automation and institutional performance, while Multiple Linear Regression Analysis was used to test the hypotheses at a 5% level of significance.

Results

Table 1: Demographic Characteristics of Respondents (N = 248)

Variable	Frequency	Percentage (%)
Male	152	61.3
Female	96	38.7
Academic Staff	122	49.2
Non-Academic Staff	126	50.8
Bachelor's Degree	74	29.8
Master's Degree	118	47.6
PhD	56	22.6
Less than 5 years	43	17.3
5–10 years	87	35.1
Above 10 years	118	47.6

Source: field Survey, 2026

The demographic characteristics indicate that respondents were adequately distributed across gender, staff category, educational qualification, and years of service, thereby providing diverse perspectives on administrative automation within the Polytechnic.

Table 2: Descriptive Statistics of Study Variables

Variable	Mean	Std. Deviation
Administrative Automation	4.18	0.61
Operational Efficiency	4.11	0.65
Service Delivery	4.09	0.67
Records Management Accuracy	4.15	0.59
Institutional Performance	4.14	0.63

Source: field Survey, 2026

The mean scores indicate that respondents generally agreed that the Polytechnic has made considerable progress in automating administrative processes and that these initiatives have positively influenced institutional performance.

Table 3: Pearson Correlation Matrix

Variables	1	2
Administrative Automation	1.000	
Institutional Performance	0.724**	1.000

Correlation is significant at $p < 0.01$.

The correlation coefficient ($r = 0.724$) indicates a strong positive relationship between administrative automation and institutional performance. This suggests that improvements in administrative automation are associated with improvements in institutional performance.

Table 4: Model Summary

R	R ²	Adjusted R ²	Std. Error
0.724	0.524	0.516	0.481

The regression model indicates that administrative automation explains 52.4% of the variation in institutional performance, while the remaining variation is attributable to other factors not included in the model.

Table 5: ANOVA

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	62.714	4	15.678	67.81	0.000
Residual	56.211	243	0.231		
Total	118.925	247			

The ANOVA result indicates that the regression model is statistically significant ($F = 67.81$, $p < 0.001$), implying that administrative automation significantly predicts institutional performance.

Table 6: Regression Coefficients

Variable	Beta	t	Sig.
Administrative Automation	0.641	11.82	0.000
Operational Efficiency	0.233	4.67	0.000
Service Delivery	0.197	3.94	0.001
Records Management Accuracy	0.184	3.51	0.001

The regression coefficients indicate that administrative automation has a positive and statistically significant effect on institutional performance ($\beta = 0.641$, $p < 0.001$). Operational efficiency, service delivery, and records management accuracy also contribute significantly to institutional performance.

Based on these results, all four null hypotheses were rejected.

Discussion of Findings

The findings revealed that automation of administrative processes has a significant positive effect on institutional performance in Abubakar Tatari Ali Polytechnic, Bauchi. The strong positive correlation between administrative automation and institutional performance suggests that increased utilization of digital technologies improves administrative effectiveness, operational efficiency, and service delivery within the institution.

The study further established that automation significantly enhances operational efficiency by reducing administrative delays, minimizing paperwork, improving workflow coordination, and facilitating timely access to institutional information. This finding is consistent with the studies of Adeyemi and Ojo (2021) and Featherman (2023) [2, 14], who reported that digital administrative systems improve organizational productivity and efficiency.

The findings also demonstrated that automation improves service delivery by facilitating faster processing of admissions, student registration, payroll administration, examination management, and communication. This agrees with the findings of Chen and Lu (2024) [8], who concluded that digital technologies enhance responsiveness and stakeholder satisfaction through improved public service delivery.

Furthermore, the study found that automation significantly improves records management accuracy by reducing human errors, minimizing duplication, enhancing data security, and facilitating rapid retrieval of institutional records. This finding corroborates Davenport and Short (2018) [10], who argued that computerized information systems enhance data integrity and support evidence-based decision-making.

Overall, the regression analysis confirms that administrative automation is a significant predictor of institutional performance, indicating that sustained investment in digital administrative systems can substantially improve governance, accountability, and service quality in Nigerian tertiary institutions.

Conclusion

This study examined the effect of automation of administrative processes on institutional performance in Abubakar Tatari Ali Polytechnic, Bauchi. The findings demonstrate that administrative automation significantly enhances operational efficiency, service delivery, records management accuracy, and overall institutional performance.

The study concludes that the adoption of automated administrative systems has contributed to improved organizational effectiveness through faster information processing, reduced administrative bottlenecks, enhanced communication, improved decision-making, and greater accountability. Consequently, administrative automation should be regarded as a strategic institutional resource for improving governance and achieving sustainable organizational performance.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. The management of Abubakar Tatari Ali Polytechnic should continue to invest in modern ICT infrastructure to strengthen administrative automation across all departments.

2. Regular training and capacity-building programmes should be organized to improve staff competence in the use of automated administrative systems.
3. Existing administrative software should be fully integrated to facilitate seamless information sharing and coordination among institutional units.
4. The Polytechnic should strengthen cybersecurity measures and data protection policies to ensure the confidentiality, integrity, and availability of institutional information.
5. Government and institutional management should provide adequate funding for the continuous maintenance, upgrading, and expansion of digital administrative infrastructure.
6. Similar studies should be conducted in other state-owned polytechnics to provide comparative evidence on the effectiveness of administrative automation in Nigerian tertiary institutions.

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