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Effectiveness of Information and Communication Technology Process Efficiency on Enhancing Employees' Performance in Moshi Municipality, Tanzania

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Abstract: ***Municipal councils in Tanzania continue to report declining employee performance outcomes despite continued investment in ICT infrastructure. This raises the fundamental question of whether such investment is leading to real gains in ICT process efficiency. The study examined the impact of ICT process efficiency on employee performance at Moshi Municipal Council in Tanzania. The study followed Venkatesh et al.'s (16) UTAUT model and used a convergent mixed-methods design. The study population comprised 2,115 permanent employees of Moshi Municipal Council, from which a sample of 336 respondents was selected using Yamane's formula. Four key informants were also selected purposively. Primary data were collected using structured questionnaires and semi- structured interview guides. Content and face validity, expert review, and Cronbach's alpha ($\alpha \geq 0.878$) ensured data validity and reliability, respectively. Quantitative data were analysed using descriptive and inferential statistics (multiple linear regression) via SPSS Version 25, and qualitative data were thematically analysed. Descriptive statistics indicated high mean scores across the board, suggesting respondents generally agreed that ICT-enabled process efficiency positively impacted their performance, particularly in work process speed and service quality. The multiple linear regression analysis revealed a statistically significant relationship ($p < 0.05$) between three ICT process efficiency predictors (work process speed, $p = 0.042$; bureaucracy reduction, $p = 0.001$; service quality, $p = 0.001$) and employee performance. The study concluded that ICT- enabled process efficiency is both statistically and operationally effective in improving employee performance at Moshi Municipal Council. It is recommended that municipal management continue to invest in digital infrastructure, provide ICT training for staff, and establish monitoring systems to track efficiency gains against performance targets. Future research should examine the long-term effects of ICT process efficiency and the role of organisational culture in mediating ICT adoption outcomes in the municipal sector. All ethical considerations were observed, with the requisite research approvals obtained, informed consent secured from all participants, and confidentiality and anonymity maintained throughout the study.***

Keywords: ***Process Efficiency, ICT Adoption, Employee Performance, Moshi Municipal Council, Tanzania.***

Nomenclature:
CAG: Controller and Auditor General
PEPMIS: Public Employee Performance Management Information System
UTAUT: Unified Theory of Acceptance and Use of Technology
ANOVA: Analysis of Variance
K–S: Kolmogorov–Smirnov
S–W: Shapiro–Wilk
VIF: Variance Inflation Factor

I. INTRODUCTION

Process efficiency, defined as the effective completion of an organisation's tasks using available technological resources to minimise delays and maximise output, has become a key driver of employee performance in public sector institutions worldwide. When an organisation uses ICT to streamline administrative processes, eliminate redundancies, and improve inter-departmental coordination, it creates conditions for employees to perform more efficiently, accurately, and accountably (Patel et al.) [1]. The use of ICT in municipal operations signals a shift from manual, paper-based processes to integrated systems that can handle high volumes of work at lower cost and in less time (Fein et al.) [2]. The link between ICT-enabled process efficiency and employee performance is thus a growing focus in academic and policy literature, especially in public institutions in developing economies where resource constraints and large backlogs directly affect service quality and staff performance.

Across developed economies such as the United Kingdom and Denmark, ICT adoption in public administration has systematically reduced bureaucratic bottlenecks and improved the speed of government service delivery (Hu et al.) [3]. Advanced digital infrastructure, including cloud computing platforms, electronic document management systems, and integrated public service portals, has enabled municipal employees to complete tasks more efficiently, track workloads in real time, and reduce the procedural steps required to complete assigned responsibilities. These efficiency gains translate directly into measurable improvements in employee performance indicators, including reduced task completion time, improved output accuracy, and higher rates of deadline adherence (Fein et al.) [2].

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Evidence from developed contexts consistently shows that investing in ICT infrastructure, paired with adequate user training and organisational support, creates a performance-enabling environment that significantly raises public sector productivity.

In Asian countries such as South Korea and China, e-government systems and integrated public administration platforms have streamlined how municipal employees manage documentation, inter-departmental communication, and citizen service delivery (Biea et al.) [4]. These systems have reduced processing times, cut administrative costs, and freed employees from routine data entry, enabling them to redirect capacity to higher-value responsibilities. The adoption of digital procurement systems, open data platforms, and government enterprise resource planning tools has transformed municipal administrations' operational environment, making ICT-enabled process efficiency a measurable contributor to workforce performance. However, these advancements have not been evenly distributed, and employees who lack the technical skills to operate ICT systems effectively often experience reduced performance outcomes despite the availability of digital tools.

In Africa, the underutilisation of ICT within public institutions has created persistent challenges for ICT process efficiency and employee performance. Despite considerable investment in digital infrastructure, many municipal councils in sub-Saharan Africa have struggled to integrate ICT into daily workflows in ways that produce consistent efficiency gains (Sadiq et al.) [5]. Barriers such as inadequate technical training, irregular power supply, weak institutional support structures, and employee resistance to change have undermined the translation of ICT investments into operational process improvements (Bubou & Job) [6]. As a result, employees in many African municipal settings continue to operate under manual processes and fragmented information systems that reduce their capacity to perform effectively and deliver quality public services within expected timelines.

In Tanzania, integrating ICT into municipal operations presents a complex picture of opportunity constrained by infrastructure deficits and skill gaps. The government has introduced performance management systems such as the Public Employee Performance Management Information System (PEPMIS) and the Public Institutions Management Information System (PIPMIS) to improve accountability and service delivery across local government authorities (Matambalya & Wolf) [7]. Despite these interventions, employees in Tanzanian municipalities still face process inefficiencies linked to poor ICT utilisation, as reliable internet access and electricity supply remain inconsistent in many operational areas (Kala) [8]. These challenges directly affect employees' ability to leverage ICT for process improvement, raising fundamental questions about the conditions under which ICT adoption produces genuine efficiency gains in Tanzanian municipal operations.

In Moshi Municipal Council specifically, the use of ICT devices in administrative operations continues to challenge efforts to improve employee work performance (Kweka & Chikoyo) [9]. Internal reviews of the municipality's performance indicate that budget execution fell from 87% in the 2021/2022 fiscal year to 82% in 2022/2023, reflecting growing inefficiencies in operational planning and ICT resource utilisation despite sustained investment in digital infrastructure (Moshi Municipal Council Annual Report) [10]. These operational inefficiencies point to systemic gaps in translating ICT adoption into process efficiency gains and, consequently, measurable improvements in employee performance.

Despite sustained investments in ICT infrastructure and employee training programmes, the actual impact of ICT process efficiency on employee performance in Tanzanian public institutions remains insufficiently understood (Pius) [11]. The Controller and Auditor General (CAG) Report [17] documents ongoing complaints of poor performance, process irregularities, and delays in task completion in municipal councils, including Moshi Municipality. Concurrently, an analysis of Moshi Municipal Council's budget utilisation reveals a concerning downward trend: budget execution stood at 87% in the 2021/2022 fiscal year but declined to 82% in 2022/2023, representing a 5% drop that suggests growing inefficiencies in process management and ICT resource utilisation (Moshi Municipal Council Annual Report) [10]. These patterns persist even as the Government of Tanzania has introduced performance management systems such as the Public Employee Performance Management Information System (PEPMIS) and the Public Institutions Management Information System (PIPMIS). It has invested in regular ICT training for municipal employees (Matambalya & Wolf) [7].

The persistence of these challenges despite institutional interventions points to a critical research gap. Prior studies conducted in contexts outside Tanzania, including Alsa et al. [12], Fahmi et al. [13], Fein et al. [2], and Hapsari et al. [14], have largely examined the role of ICT process efficiency in influencing employee performance in industrial, educational, or private sector settings, without specifically evaluating the effectiveness of ICT-enabled process efficiency as measured through work process speed, bureaucracy reduction, and service quality within a municipal council setting. None of the reviewed studies was conducted within the specific context of Moshi Municipality, Tanzania. This study therefore addressed this gap by systematically examining the effectiveness of ICT process efficiency on employee performance in Moshi Municipal Council, focusing on these three distinct dimensions of ICT process utility.

A. Objective of the Study

This study aimed to examine how ICT process efficiency enhances employee performance at Moshi Municipal Council, Tanzania.

B. Research Hypotheses

H_{01}: ICT process speed effectiveness is not statistically significant in enhancing employee performance at Moshi Municipal Council.

H_{02}: ICT bureaucracy reduction effectiveness does not significantly enhance employee performance at Moshi Municipal Council.

H_{03}: ICT service quality is not statistically significant in enhancing employee performance at Moshi Municipal Council.

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C. Significance of the Study

This study is significant to multiple stakeholders, particularly municipal administrators, human resource managers, and departmental heads at Moshi Municipal Council, as it provides evidence-based information on how ICT-enabled process efficiency influences employee performance outcomes. By evaluating the effectiveness of process efficiency, the study equips decision-makers with practical tools to improve resource allocation, address workflow bottlenecks, and develop strategies for improving public service delivery in a resource-constrained environment. Theoretically, the study is grounded in the Unified Theory of Acceptance and Use of Technology (UTAUT), which emphasises the role of facilitating conditions and performance expectancy in shaping ICT-driven work outcomes. Moreover, the findings enrich public sector management and human resource development by providing context-specific evidence from a Tanzanian municipality, contributing to both academic discourse and practical decision-making on ICT adoption and employee performance management.

II. LITERATURE REVIEW

A. Theoretical Literature Review

This study was guided by the Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh et al. [16]. The theory emerged from a systematic synthesis of eight prior technology acceptance models and posits that actual technology use is determined by behavioural intention, shaped by four core constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions. Individual characteristics, including age, gender, experience, and voluntariness of use, moderate the effects of these constructs. The theory provides a structured, empirically validated lens for understanding why ICT adoption in organisational settings succeeds or fails to produce measurable improvements in work performance.

The primary strength of UTAUT and its extension, UTAUT2, is that they have been validated across diverse geographical and cultural contexts, demonstrating robustness and generalisability beyond their original organisational settings. Despite its explanatory strengths, the model has been criticised for insufficiently accounting for constructs such as trust, self-efficacy, and perceived risk, which empirical studies have found to be significant determinants of technology adoption behaviour.

Applied to this study, UTAUT is directly relevant because it systematically accounts for the organisational and infrastructural factors that shape ICT adoption outcomes in the municipal workplace, and its construct of facilitating conditions specifically addresses the infrastructure limitations documented at Moshi Municipal Council that constrain the translation of ICT process efficiency investments into measurable employee performance gains.

B. Empirical Literature Review

This section reviews empirical studies on the effectiveness of ICT process efficiency in enhancing employee performance, examining how ICT-enabled work process speed, bureaucracy reduction, and service quality contribute to employee performance outcomes.

Alsa et al. [12] studied key process efficiency factors affecting employee performance in issuing land certificates at the Ministry of Affairs and Spatial Planning Agency in Biak Numfor Regency. The study used a cross-sectional design and structural equation modelling to test the model and hypotheses using data from 306 respondents. The findings showed that employee performance had not effectively improved land certificate issuance services, as evidenced by a shortage of human resources and low employee knowledge of work discipline. The study concluded that human resources, service management, and infrastructure facilities were essential to increasing employee efficiency in generating land certificates quickly and effectively. While this study was informative regarding process efficiency and service delivery, its focus on land administration in an Indonesian regulatory environment limited its direct applicability to the Tanzanian municipal context. This study addressed this gap by focusing on Moshi Municipal Council and using a mixed-methods design that triangulates quantitative questionnaire data with qualitative insights from key informants.

Engsih et al. [15] examined the effect of digital process competence and smart digital service on service quality and employee performance among civil servants in government organisations across Central Java Province, Indonesia. The study used a quantitative research design and collected data through structured questionnaires administered to 262 respondents selected through proportional random sampling, and analysed the data using Structural Equation Modelling. The findings revealed that digital competence had a significant positive effect on smart digital service, and that smart digital service, in turn, significantly improved service quality; however, smart digital service did not exert a significant direct effect on employee performance, while service quality was found to have a significant positive effect on performance. Although this study offered valuable evidence on the mechanisms linking digital process elements to employee performance, its focus on Indonesian provincial civil servants operating within a distinct governance and cultural context limited its direct applicability to the Tanzanian municipal setting. The present study addressed this gap by examining ICT process efficiency through the dimensions of work process speed, bureaucracy reduction, and service quality within Moshi Municipal Council, using a convergent mixed-methods design that triangulates quantitative survey data with qualitative insights from key informants to capture contextual dynamics not addressed in the Indonesian study.

Fahmi et al. [13] studied the extent to which production process efficiency could increase productivity, staff morale, and job satisfaction within organisations. The study used a cross-sectional design and collected data through questionnaires, analysing them using descriptive statistics and a regression model. The study found that managing employees throughout the performance management cycle was crucial to an organisation's viability. That process efficiency improved employee

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performance and workplaces by enhancing processes and productivity. Although the study's work-from-home context differed from the municipal operational environment examined in the present study, its finding that process efficiency was a significant performance mediator was theoretically relevant. The cross-sectional design, shared with the present study, was acknowledged as a limitation for observing temporal dynamics in the efficiency-performance relationship, which the present study mitigated by supplementing quantitative data with qualitative evidence from key informants.

Fein et al. [2] studied the impact of business process efficiency on employee performance in public entities. The study adopted a cross-sectional research design and collected data through questionnaires, which it analysed using descriptive statistics and regression modelling. The study found that business process efficiency significantly affected employee performance and that process automation significantly influenced employee efficiency in public entities. However, the study relied solely on quantitative data collected through questionnaires. It did not incorporate qualitative insights that could explain the contextual and organisational mechanisms underlying the observed statistical relationships, limiting understanding of how and why process efficiency influenced employee performance. The present study addressed this limitation by adopting a convergent mixed-methods design, integrating quantitative questionnaire data with qualitative insights from key informant interviews to provide a more comprehensive and contextually grounded understanding of the effectiveness of ICT process efficiency on employee performance at Moshi Municipal Council.

Hapsari et al. [14] examined the role of process efficiency in organisational citizenship and employee performance. The study adopted a case study design and collected data through questionnaires, which it analysed using descriptive statistics and a regression model. The study found that all processes changed under the new system benefited employees and contributed to good governance. However, because the study used a qualitative method, its findings had limited generalisability to broader populations, making it challenging to apply them to different contexts or draw universal conclusions. The present study addressed this limitation by using a mixed-methods approach, allowing a comprehensive exploration of complex phenomena from multiple perspectives and producing a more complete and nuanced understanding of process efficiency and employee performance in the Moshi Municipality setting.

The reviewed empirical studies on the effectiveness of ICT process efficiency in enhancing employee performance spanned diverse contexts, including Indonesia, Tanzania, Romania, and Nigeria. Studies such as Alsa et al. [12], Fahmi et al. [13], Fein et al. [2] and Hapsari et al. [14] confirmed that ICT process efficiency decisions, particularly those involving ICT-enabled automation, workflow simplification, and service quality improvement, played an important role in shaping employee operational performance and organisational effectiveness. However, several serious gaps remained. Research on ICT process efficiency often highlighted structural and management factors rather than ICT-specific efficiency dimensions such as work process speed, bureaucracy reduction, and service quality within local government settings. Evidence on how ICT-enabled process efficiency specifically influenced employee performance in Tanzanian municipal councils, and how it connected to measurable performance outcomes, remained scarce. Most studies focused on private or industrial settings, examined service sectors outside municipal administration, or lacked inferential statistical analysis of the three ICT process efficiency dimensions examined in this study. These gaps justified the current study, which examined the effectiveness of ICT process efficiency on employee performance in Moshi Municipal Council using a mixed-methods approach.

III. METHODOLOGY

This study adopted a convergent parallel design within a mixed-methods research approach, integrating quantitative and qualitative techniques to provide a comprehensive understanding of how ICT process efficiency affects employee performance at Moshi Municipal Council. The design enabled the collection and analysis of numerical and narrative data in a single phase, allowing triangulation and complementarity of findings.

The study targeted a total population of 2,115 permanent employees of Moshi Municipal Council, as recorded in the Moshi Municipal Council Annual Report [10]. Yamane's formula determined a sample of 336 respondents at a 5% margin of error. The study used stratified sampling to select 336 employee respondents from nine municipal departments; within each stratum, respondents were selected through simple random sampling. The study used purposive sampling to select four key informants, comprising department heads, based on their specialised knowledge of ICT systems, digital tools, and information management practices within their respective departments.

The study collected data using structured questionnaires administered to the sampled employees and an interview guide administered to key informants. The questionnaires captured quantitative measures of ICT process efficiency across three dimensions: work process speed, bureaucracy reduction, and service quality, as well as their effects on employee performance. The interview data provided deeper contextual insights into how ICT process efficiency decisions influenced employee performance at the municipality. To ensure instrument quality, the researchers established content validity through expert review and assessed face validity during pilot testing with 34 respondents. The researchers assessed questionnaire reliability using Cronbach's Alpha, with a minimum threshold of $\alpha \geq 0.70$ considered acceptable for social science research; the result was 0.878.

Quantitative data were analysed using descriptive and inferential statistics in SPSS Version 25. Descriptive statistics, including frequencies, percentages, and means, summarised the data. Inferential analysis used multiple linear regression at the 5% significance level to examine the relationship between ICT process efficiency

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dimensions and employee performance. The regression model was specified as:

$$Y = \beta 0 + \beta 1X^1 + \beta 2X2 + \beta 3X3 + \varepsilon \quad (1)$$

Where Y represents employee performance; X_1 represents work process speed, X2 represents bureaucracy reduction, and X3 represents service quality. β_0 represents the intercept, β_1 to β_3 are the regression coefficients, and ε is the error term. This model follows UTAUT, which asserts that ICT adoption yields measurable and sustainable performance outcomes when facilitating conditions, performance expectancy, and effort expectancy are aligned. Employee performance served as the dependent variable, while the three ICT process efficiency dimensions were treated as independent variables. Qualitative data from semi-structured interviews with key informants were analysed contextually, and the emerging themes enriched the quantitative findings by offering a deeper understanding of how ICT process efficiency decisions influenced employee performance at the municipality.

The study strictly observed ethical considerations throughout. The Directorate of Postgraduate Studies at Mwenge Catholic University granted research clearance, and the Kilimanjaro Regional Commissioner issued a data collection permit. The study secured informed consent from all participants before data collection and ensured confidentiality and anonymity. All data were used solely for academic purposes in accordance with established ethical standards.

IV. FINDINGS AND DISCUSSION

This section presents the results and analysis derived from the collected data in the research study.

A. Response Rate

The researcher distributed questionnaires to 336 sampled employees of Moshi Municipal Council. Table I summarises the response rate.

Table I: Response Rate

Categories	Sample Size	Respondents Rate	Respondents Rate
Municipal Employees	336	248	73.8%

Source: Field Data (2026)

Table I shows that out of 336 sampled employees, 248 returned completed questionnaires, yielding a response rate of 73.8%. This rate is considered adequate for academic research and sufficient to produce credible, representative findings. The relatively high participation level is attributable to the researcher's direct presence during data collection, the study's relevance to employees' daily operational experiences, and the questionnaire's straightforward structure. The four purposively selected key informants participated in the semi-structured interviews, resulting in a 100% response rate for the study's qualitative component.

B. Demographic Characteristics

The study assessed four key demographic characteristics of employees at Moshi Municipal Council, including gender, education level, and years of working experience. These characteristics provided important background information on workforce composition and its potential influence on perceptions of ICT process efficiency. Table II presents the findings.

Table II: Demographic Characteristics

Items	Items	f	%	Total
Gender	Male	99	39.9	
Gender	Female	149	60.1	248
Education Level	Certificate	58	23.4	
Education Level	Diploma	74	29.8	
Education Level	Degree/Advanced Diploma	97	39.1	
Education Level	Masters	17	6.9	
Education Level	PhD	2	0.8	248
Working Experience	Less than 5 years	53	21.4	
Working Experience	5-9 years	47	19.0	
Working Experience	10 years and above	148	59.7	248

Source: Field Data (2026)

Table II shows that 60.1% of participants were female, while 39.9% were male. These findings indicate that the workforce at Moshi Municipal Council is predominantly female, consistent with patterns in Tanzanian public-sector employment, where female employees have increasingly occupied administrative and service delivery roles. The representation of both gender groups in the sample strengthens the internal validity of the study's conclusions by ensuring that perceptions of ICT process efficiency reflect a broad range of operational and administrative experiences across the workforce.

Table II shows that most participants held a degree or Advanced Diploma (39.1%), followed by those with Diploma qualifications (29.8%) and Certificate-level education (23.4%). Only 6.9% held a Master's degree, and 0.8% held a PhD. The dominance of degree-level employees suggests a workforce with a reasonable educational foundation for engaging with ICT systems and understanding ICT process efficiency concepts. Employees with higher educational attainment are generally better positioned to evaluate and articulate the tangible impact of ICT process efficiency on their daily work performance, lending credibility to the study's quantitative findings.

Table II also shows that 59.7% of participants had worked at the municipality for 10 years or more, 21.4% had less than 5 years of experience, and 19.0% had between 5 and 9 years. The substantial proportion of long-tenured employees suggests institutional familiarity with the municipality's operational history and evolving ICT infrastructure, enabling more informed, experience-grounded assessments of how ICT-enabled process efficiency has or has not improved employee performance over time. This level of institutional experience enhances the reliability of the self-reported effectiveness ratings used in this study's descriptive analysis.

C. Cross Tabulation Between Education Level and the Effectiveness of ICT Process Efficiency on Enhancing Employees' Performance in Moshi Municipality

This study cross-tabulated employees' education level with their perceptions of the effectiveness of ICT process efficiency in enhancing employee performance.

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Examining the interaction between these variables showed how different levels of academic attainment shaped employees' views on the effectiveness of ICT processes in areas such as work process speed, bureaucracy reduction, and service quality improvement. Education level plays a critical role in employees' capacity to understand, adapt to, and derive value from digital systems, which in turn affects how they assess the impact of ICT process efficiency on their daily responsibilities. Table III presents the cross-tabulation results for three selected process efficiency items and their interaction with employee education level.

Table III: Cross-Tabulation Between Education Level * the Effectiveness of ICT Process Efficiency on Enhancing Employees' Performance in Moshi Municipality

		Education Level	Education Level	Education Level	Education Level	Education Level	Total
		Certificate	Diploma	Degree/Advanced Diploma	Masters	PhD	Total
How effective is ICT adoption in improving the speed at which work processes are completed?	Ineffective	2	0	2	0	0	4
How effective is ICT adoption in improving the speed at which work processes are completed?	Slightly Effective	2	3	5	1	0	11
How effective is ICT adoption in improving the speed at which work processes are completed?	Moderately Effective	12	19	24	4	2	61
How effective is ICT adoption in improving the speed at which work processes are completed?	Effective	25	36	37	7	0	105
How effective is ICT adoption in improving the speed at which work processes are completed?	Very Effective	17	16	29	5	0	67
Total	Total	58	74	97	17	2	248
How ineffective are ICT processes in reducing bureaucratic procedures and speeding up work?	Ineffective	4	2	5	2	0	13
How ineffective are ICT processes in reducing bureaucratic procedures and speeding up work?	Slightly Effective	6	6	5	2	1	20
How ineffective are ICT processes in reducing bureaucratic procedures and speeding up work?	Moderately Effective	16	21	32	4	0	73
How ineffective are ICT processes in reducing bureaucratic procedures and speeding up work?	Effective	19	33	40	5	0	97
How ineffective are ICT processes in reducing bureaucratic procedures and speeding up work?	Very Effective	13	12	15	4	1	45
Total	Total	58	74	97	17	2	248
How effective is process efficiency through ICT in improving the overall quality of service delivery?	Ineffective	1	0	0	0	1	2
How effective is process efficiency through ICT in improving the overall quality of service delivery?	Slightly Effective	3	2	5	1	0	11
How effective is process efficiency through ICT in improving the overall quality of service delivery?	Moderately Effective	14	21	24	6	1	66
How effective is process efficiency through ICT in improving the overall quality of service delivery?	Effective	17	30	39	4	0	90
How effective is process efficiency through ICT in improving the overall quality of service delivery?	Very Effective	23	21	29	6	0	79
Total	Total	58	74	97	17	2	248

Source: Field Data (2026)

The results in Table III reveal patterns in how employees with different education levels perceived ICT's effectiveness in improving work process speed. Among Certificate holders, 25 out of 58 rated this as Effective, while 17 rated it as Very Effective, indicating strong recognition of speed improvements even at lower levels of formal education. Among Diploma holders, 36 rated it as Effective and 16 as Very Effective. In contrast, Degree/Advanced Diploma holders recorded 37 Effective and 29 Very Effective responses, the highest concentration of Very Effective ratings among all education categories. Master's holders showed 7 Effective and 5 Very Effective responses, reflecting continued positive assessment among the most highly qualified staff, while both PhD holders rated this item as Moderately Effective. This pattern is consistent with UTAUT's effort expectancy construct, which posits that employees with stronger educational grounding are generally better equipped to interpret and adapt to ICT-enabled process changes, translating into more favourable assessments of speed-related gains.

Regarding the effectiveness of ICT processes in reducing bureaucratic procedures and speeding up work, the cross-tabulation in Table III shows a more varied pattern of responses across education groups. Among Certificate holders, 19 rated it Effective and 13 Very Effective, while 16 rated it Moderately Effective and 4 rated it Ineffective. Among Diploma holders, 33 rated it Effective and 12 Very Effective; among Degree/Advanced Diploma holders, 40 rated it Effective and 15 Very Effective, with the highest Moderately Effective count (32) of any group. Master's holders were more evenly spread, with 5 Effective and 4 Very Effective responses against 2 Ineffective ratings, while PhD holders were split between Slightly Effective and Very Effective. The higher concentration of Moderately

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Effective and Ineffective ratings among Degree and Master's holders suggests that more educated employees may have higher expectations for bureaucracy reduction and are therefore more critical of persistent procedural bottlenecks. This aligns with Fein et al. [2], who found that process automation significantly influenced efficiency in public entities but was constrained by institutional workflow norms.

For the effectiveness of process efficiency through ICT in improving the overall quality of service delivery, the cross-tabulation in Table III shows strong positive ratings across all education categories. Among Certificate holders, 17 out of 58 rated this as Effective and 23 as Very Effective, the highest proportion of Very Effective ratings relative to group size among all categories. Among Diploma holders, 30 rated it Effective and 21 Very Effective, while Degree/Advanced Diploma holders contributed the largest frequency of Effective (39) and Very Effective (29) responses. Master's holders showed a moderate spread, with 6 Moderately Effective, 4 Effective, and 6 Very Effective responses. In contrast, one of the two PhD holders rated the item as Ineffective and the other as Moderately Effective. The broadly consistent pattern across most education groups reinforces that service quality improvement is recognised as one of the most visible and tangible outcomes of ICT-enabled process efficiency at Moshi Municipal Council, regardless of academic qualification. This finding aligns with Hapsari et al. [14], who found that process changes benefited both employees and service recipients by improving governance outcomes.

D. Effectiveness of ICT Process Efficiency on Enhancing Employees' Performance in Moshi Municipality

This study examined how ICT process efficiency enhanced employee performance at Moshi Municipal Council. Employees were surveyed regarding their perceptions of how various ICT process efficiency dimensions enhanced employee performance, as detailed in Table IV.

Table IV: The Effectiveness of ICT Process Efficiency on Enhancing Employees' Performance in Moshi Municipality (n=248)

Key: I = Ineffective, SE = Slightly Effective, ME = Moderately Effective, E = Effective and VE = Very Effective

ICT Process Efficiency	I	I	SE	SE	ME	ME	E	E	VE	VE	Mean	STD
ICT Process Efficiency	f	%	f	%	f	%	f	%	f	%	Mean	STD
How ineffective are the ICT processes in enhancing Employees' performance?	12	4.8	26	10.5	53	21.4	72	29.0	85	34.3	3.77	1.17
How effective is ICT adoption in improving the speed at which work processes are completed?	4	1.6	11	4.4	61	24.6	105	42.3	67	27.0	3.89	0.91
How ineffective are ICT process changes in enhancing employees' performance?	12	4.8	28	11.3	71	28.6	81	32.7	56	22.6	3.57	1.10
How effective is process efficiency through ICT in enhancing employees' ability to meet work deadlines?	4	1.6	15	6.0	60	24.2	81	32.7	88	35.5	3.94	0.99
How effective are ICT processes in optimising resource utilisation at work?	2	0.8	15	6.0	64	25.8	95	38.3	72	29.0	3.89	0.92
How ineffective are ICT processes in reducing bureaucratic procedures and speeding up work?	13	5.2	20	8.1	73	29.4	97	39.1	45	18.1	3.57	1.04
How effective is ICT integration in reducing process challenges in daily work?	2	0.8	16	6.5	75	30.2	91	36.7	64	25.8	3.80	0.92
How ineffective are the efficiency gains from ICT processes relative to the time invested in learning them?	14	5.6	28	11.3	68	27.4	79	31.9	59	23.8	3.57	1.14
How effective is process efficiency through ICT in improving the overall quality of service delivery?	2	0.8	11	4.4	66	26.6	90	36.3	79	31.9	3.94	0.91
How ineffective is ICT process efficiency in translating into improved performance outcomes?	16	6.5	28	11.3	65	26.2	78	31.5	61	24.6	3.56	1.16

Source: Field Data (2026)

Table IV shows that 34.3% of respondents rated ICT processes as Very Effective in enhancing employee performance, while 29.0% rated them as Effective and 21.4% as Moderately Effective. A combined 15.3% rated them as Slightly Effective (10.5%) or Ineffective (4.8%). The mean score of 3.77, with a standard deviation of 1.17, indicates moderate-to-positive consensus with a visible spread in responses, reflecting variability in employees' experiences of ICT's contribution to overall performance enhancement. This dispersion suggests that while a clear majority

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acknowledged the performance-enhancing role of ICT processes, a meaningful minority had not observed consistent efficiency gains in their daily work.

This variability is consistent with the UTAUT construct of effort expectancy, which holds that the ease of use of ICT systems directly shapes the degree to which employees engage with them and benefit from their efficiency potential. Where ICT systems are perceived as difficult to navigate or insufficiently integrated into existing workflows, their capacity to enhance performance is constrained regardless of the organisation's investment in digital infrastructure. Fahmi et al. [13] similarly found that managing employees throughout the performance management cycle was critical to ensuring that ICT process efficiency gains translated into observable productivity improvements. This implies that Moshi Municipal Council management should strengthen the alignment between ICT systems and daily work tasks to ensure that the performance-enhancing potential of digital processes is consistently experienced across all departments.

Table IV shows that 27.0% of respondents rated ICT adoption as Very Effective in improving the speed at which work processes are completed, 42.3% rated it as Effective, and 24.6% rated it as Moderately Effective. Only 4.4% rated it as Slightly Effective and 1.6% as Ineffective. The mean score of 3.89, with a standard deviation of 0.91, reflects strong positive consensus with relatively low dispersion, indicating broad agreement that ICT adoption has meaningfully contributed to process speed at the municipality. These findings suggest perceptions are consistent across the workforce, indicating that the operational benefits of faster process completion are clearly felt at the operational level. When Key Informant 1 was asked about how effective ICT adoption had been in improving the speed at which work processes were completed, he stated:

"Since the municipality introduced the integrated digital document processing system, the time it takes to process service requests has reduced considerably. Tasks that previously required staff to physically move files between departments and wait for manual approvals now take a fraction of the time because approvals are handled electronically. I have seen staff complete daily filing and reporting tasks in under half the time it used to take, and that directly frees them to handle more citizen requests per day. The speed improvements are real, though they are most visible in departments where ICT adoption has been most consistent." (Interview with Key Informant 1, April 2026).

According to Key Informant 1, adopting digital processes reduced inter-departmental document transfer times. It sped up daily task completion, directly increasing the volume of service requests employees could handle in a working day. The qualitative insight confirms that process speed gains from ICT adoption are real but unevenly distributed across departments, reflecting the UTAUT construct of facilitating conditions, which holds that the degree to which employees benefit from ICT is shaped by the consistency of organisational infrastructure and support (Venkatesh et al.) [16]. This finding aligns with Fein et al. [2], who showed that process automation significantly influenced employee efficiency in public entities. This implies that the municipality should standardise digital process adoption across all departments and ensure ICT systems are adequately maintained to sustain the observed speed improvements.

Table IV shows that 22.6% of respondents rated ICT process changes as Very Effective in enhancing employee performance, 32.7% as Effective, and 28.6% as Moderately Effective. A combined 16.1% rated them as Slightly Effective (11.3%) or Ineffective (4.8%). The mean score of 3.57, with a standard deviation of 1.10, reflects moderate positive agreement, with a wider spread indicating more varied perceptions of whether ICT process changes have consistently enhanced employee performance. These findings imply that while many employees recognise the performance-enhancing effects of ICT process changes, a significant portion either has not experienced meaningful change or perceives the changes as insufficient to alter their core performance outcomes. This variability may reflect differences in the type and quality of ICT processes introduced across departments, as well as differences in employee capacity to adapt to changed processes. Hapsari et al. [14] found that process changes due to new systems benefited employees when institutional implementation adequately supported them, a finding directly relevant to the moderate consensus observed here. This implies that Moshi Municipal Council should invest in structured change management and ICT onboarding support to ensure process changes translate into consistent, measurable performance improvements across departments.

Table IV shows that 35.5% of respondents rated ICT process efficiency as Very Effective in enhancing employees' ability to meet work deadlines. In comparison, 32.7% rated it Effective and 24.2% rated it Moderately Effective. Only 6.0% rated it Slightly Effective, and 1.6% rated it Ineffective. The mean score of 3.94, with a standard deviation of 0.99, is the highest among all ten ICT process efficiency items, indicating strong and broadly consistent agreement that ICT process efficiency is most visibly associated with improved deadline adherence at the municipality. These findings imply that deadline-related performance improvement is among the most consistently observed outcomes of ICT adoption across different employee groups. When Key Informant 2 was asked about the effectiveness of ICT process efficiency in enabling employees to meet work deadlines, she noted:

"One of the most noticeable changes since we strengthened our ICT systems is that employees are now able to meet report submission deadlines more consistently than before. The old manual process meant that a single missing signature or a misplaced file could delay an entire departmental report by days. With digital tracking and electronic approval pathways, those delays have dropped significantly. Staff can submit their contributions on time because the system gives them visibility into where a document is and what is still outstanding so that they can follow up proactively rather than waiting without information. (Interview with Key Informant 2, April 2026).

According to Key Informant 2, ICT-enabled digital tracking and electronic approval systems directly improved employees' ability to monitor document progress and submit work on time, reducing delays that previously arose

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from manual bottlenecks. This qualitative evidence provides a concrete operational explanation for the high mean score in the quantitative data, confirming that ICT process efficiency translates into measurable gains in deadline adherence. This finding is consistent with Alsa et al. [12], who found that infrastructure efficiency was essential to enabling employees to complete service tasks quickly and effectively. Thus, the municipality needs to prioritise maintaining and expanding digital document-tracking systems to sustain and extend the deadline performance gains observed.

Table IV shows that 29.0% of respondents rated ICT processes as Very Effective in optimising resource utilisation at work, 38.3% as Effective, and 25.8% as Moderately Effective. A combined 6.8% rated them as Slightly Effective (6.0%) or Ineffective (0.8%). The mean score of 3.89 with a standard deviation of 0.92 reflects strong positive consensus with low dispersion, indicating broad agreement across the workforce that ICT contributes to more efficient use of organisational resources. The near absence of Ineffective ratings suggests that resource optimisation through ICT is an observable phenomenon at the municipality, even among employees who rate it as only moderately effective. This implies that communication should more explicitly link the resource-optimisation benefits of ICT adoption to employees to reinforce the performance expectancy perceptions that sustain ICT engagement. This finding aligns with the UTAUT construct of performance expectancy, which holds that employees' belief that ICT will help them improve job performance is a primary driver of adoption and engagement with digital tools. When employees observe that ICT systems enable them to accomplish more within the same resource envelope, the motivational basis for continued adoption is reinforced. Ingsih et al. [15] similarly found that process efficiency improved productivity and reduced unnecessary delays in task completion.

Table IV shows that 18.1% of respondents rated ICT processes as Very Effective in reducing bureaucratic procedures and speeding up work, 39.1% as Effective, and 29.4% as Moderately Effective. A combined 13.3% rated them as Slightly Effective (8.1%) or Ineffective (5.2%). The mean score of 3.57, with a standard deviation of 1.04, reflects moderate positive agreement. Still, the visible proportion of Ineffective and Slightly Effective ratings indicates meaningful dissatisfaction with the pace of bureaucracy reduction through ICT. The relatively lower mean compared to deadline adherence and resource optimisation items suggests that bureaucracy reduction through ICT remains an area where the municipality has not yet achieved the efficiency gains that employees consider fully adequate. When Key Informant 3 was asked about the effectiveness of ICT processes in reducing bureaucratic procedures and speeding up work, he explained:

"The honest reality is that while ICT has helped us with some of the more routine processes, there are still many administrative requirements that demand physical signatures, physical files, and in-person clearances that the ICT systems have not replaced. Some of these bureaucracy steps are regulatory requirements that we cannot simply digitise without policy changes at a higher level. So, employees may use the ICT system to draft a document electronically, but then still need to print it, get it signed by three different officers, and physically deliver it to another office. Until those procedural requirements are streamlined, the bureaucracy burden remains high despite the ICT investment." (Interview with Key Informant 3, April 2026).

According to Key Informant 3, the primary constraint on ICT's effectiveness in reducing bureaucratic procedures was not a failure of the technology itself but rather the persistence of regulatory requirements that mandated physical signatures, physical document handling, and in-person clearances that ICT systems had not yet replaced. This qualitative explanation directly accounts for the moderate mean score observed quantitatively, revealing that bureaucracy reduction is constrained by policy and regulatory environments rather than solely by ICT capacity or employee adoption behaviour. This finding aligns with Fein et al. [2], who found that process automation influenced efficiency in public entities but was limited by institutional workflow norms. Thus, Moshi Municipality should collaborate with regulatory authorities to develop policies that permit electronic approval processes, extending ICT efficiency gains into the regulatory dimensions of municipal administration.

Table IV shows that 25.8% of respondents rated ICT integration as Very Effective in reducing process challenges in daily work. In comparison, 36.7% rated it Effective and 30.2% rated it Moderately Effective. A combined 7.3% rated it as Slightly Effective (6.5%) or Ineffective (0.8%). The mean score of 3.80, with a standard deviation of 0.92, reflects generally positive agreement with relatively low dispersion, indicating that employees broadly perceive ICT integration as a useful mechanism for reducing operational challenges at the municipality. The near absence of Ineffective ratings and the concentration of responses in the Moderately Effective to Very Effective range suggest that most employees experience some degree of challenge reduction from ICT integration, even if the magnitude varies across departments. This implies that management at Moshi Municipal Council fosters an ICT adoption culture through peer learning initiatives and supervisory endorsement, extending challenge-reduction benefits more evenly across the organisation. This finding aligns with UTAUT's social influence construct, which holds that when supervisors and peers adopt ICT tools and communicate their operational benefits, employees are more likely to engage with those tools and derive challenge-reduction benefits. Hapsari et al. [14] similarly found that all processes changed by new systems benefited employees and contributed to good governance.

Table IV shows that 23.8% of respondents rated the efficiency gains from ICT processes as Very Effective relative to the time invested in learning them. In comparison, 31.9% rated them as Effective and 27.4% as Moderately Effective. A combined 16.9% rated them as Slightly Effective (11.3%) or Ineffective (5.6%). The mean score of 3.57, with a standard deviation of 1.14, reflects moderate positive agreement with notable dispersion, indicating that while most employees acknowledge some efficiency return on the time invested in ICT learning, a substantial minority felt the time required to learn ICT systems were disproportionate to the efficiency gains received. The relatively high standard deviation reflects heterogeneous perceptions, likely shaped by differences in technical aptitude, the quality of training received, and the

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complexity of ICT systems encountered across departments. This implies that the municipality should invest in accessible, role-specific ICT training programmes that reduce the learning burden and ensure employees experience efficiency gains clearly and quickly after training. This finding directly engages the UTAUT construct of effort expectancy, which posits that perceived ease of use is a significant determinant of adoption and performance outcomes. When employees perceive the learning investment as high relative to the efficiency gains, the motivational basis for sustained ICT engagement is weakened, and performance improvements are constrained.

Table IV shows that 31.9% of respondents rated process efficiency through ICT as Very Effective in improving the overall quality of service delivery, 36.3% as Effective, and 26.6% as Moderately Effective. A combined 5.2% rated it as Slightly Effective (4.4%) or Ineffective (0.8%). The mean score of 3.94 with a standard deviation of 0.91 reflects the joint-highest mean score alongside deadline adherence, indicating strong and broadly consistent agreement that ICT-enabled process efficiency translates into tangible improvements in service quality at the municipality. The narrow standard deviation confirms that employee groups perceive service quality improvement through ICT process efficiency with relatively high consistency. These findings imply that improvement metrics are a key performance indicator for evaluating the effectiveness of ICT process adoption, and that investment should focus on systems that provide staff with real-time validation and error-checking tools. When Key Informant 4 was asked about the effectiveness of ICT process efficiency in improving the overall quality of service delivery, she responded:

"When our administrative processes became more efficient through the ICT tools introduced in the past few years, the quality of our service delivery to citizens improved in ways that we could measure. Citizens who used to wait for two or three weeks for their documentation to be processed are now receiving their documents within days, and the accuracy of those documents has also improved because the system minimises the manual transcription errors that used to occur. The staff feel more confident in the work they produce because the digital systems provide them with templates, validation checks, and audit trails, all of which reduce errors and improve the standard of outputs. Better processes genuinely produce better results." (Interview with Key Informant 4, April 2026).

According to Key Informant 4, ICT-enabled process efficiency generated directly observable improvements in citizen service quality by reducing processing timelines, minimising transcription errors, and improving the accuracy and consistency of documentation outputs. The qualitative insight confirms that the service quality benefits of ICT process efficiency extend beyond employee experience to citizen experience, reinforcing the strategic importance of digital process integration for the municipality's public service mandate. This finding aligns with Alsa et al. (12), who found that infrastructure efficiency and service management were essential to enabling employees to deliver services quickly, evenly, and effectively.

Table IV shows that 24.6% of respondents rated ICT process efficiency as Very Effective in translating into improved performance outcomes, 31.5% as Effective, and 26.2% as Moderately Effective. A combined 17.8% rated it as Slightly Effective (11.3%) or Ineffective (6.5%). The mean score of 3.56, with a standard deviation of 1.16, is the lowest among all ten ICT process efficiency items and shows the widest spread of responses across the full effectiveness scale. This combination of a lower mean and higher dispersion implies that, while many employees recognise ICT process efficiency as a contributor to improved performance outcomes, a notable minority expressed scepticism or did not observe tangible performance improvements attributable to ICT process changes in their own roles. The relatively higher Ineffective rating for this item, compared to others, indicates that the link between ICT process efficiency and concrete performance outcome improvements is not universally experienced at the operational level. This finding is consistent with Ingsih et al. [15], who found that process efficiency reduced unnecessary delays in task completion, but that the performance impact depended on the quality and scope of the efficiency measures implemented. Therefore, the municipality should develop clearer performance monitoring frameworks that link ICT process adoption to measurable performance targets, enabling employees to observe the direct connection between process efficiency improvements and their own performance outcomes.

V. HYPOTHESES TESTING

Further tests examined the effectiveness of ICT process efficiency in enhancing employee performance at Moshi Municipal Council using a multiple linear regression model. The hypotheses were tested at the 0.05 significance level. The null hypotheses stated that ICT process efficiency in work process speed, bureaucracy reduction, and service quality does not significantly enhance employee performance at Moshi Municipal Council.

The analysis examined the relationship between the three ICT process efficiency predictors, namely work process speed, bureaucracy reduction, and service quality, and the dependent variable, employee performance, using a multiple linear regression model. The model assumed a linear relationship between the predictors and the dependent variable. The findings reject the overall null hypothesis, indicating that ICT process efficiency, as operationalised through work process speed, bureaucracy reduction, and service quality, has a statistically significant effect on employee performance at Moshi Municipal Council

A. Diagnostic Tests

This study applied a range of diagnostic tests to evaluate the validity and reliability of the regression model used to examine the effectiveness of ICT process efficiency in enhancing employee performance at Moshi Municipal Council. These tools include the normality test, the multicollinearity test, residual statistics, the model summary, the Analysis of Variance (ANOVA), and the coefficients table.

B. Normality Tests

To examine the effectiveness of ICT process efficiency in enhancing employee

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performance at Moshi Municipal Council, a normality test was conducted to assess whether the model's residuals satisfied the assumption of normal distribution, which is critical for the validity of parametric statistical analyses. Table V presents the results of the Kolmogorov–Smirnov and Shapiro–Wilk tests.

Table V: Tests of Normality

	Kolmogorov-Smirnov[a]	Kolmogorov-Smirnov[a]	Kolmogorov-Smirnov[a]	Shapiro-Wilk	Shapiro-Wilk	Shapiro-Wilk
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual	.122	248	.000	.793	248	.000
a. Lilliefors Significance Correction	a. Lilliefors Significance Correction	a. Lilliefors Significance Correction	a. Lilliefors Significance Correction	a. Lilliefors Significance Correction	a. Lilliefors Significance Correction	a. Lilliefors Significance Correction

Table V shows that the Kolmogorov–Smirnov (K–S) test yielded a statistic of 0.122 with a significance value (p-value) of 0.000, while the Shapiro–Wilk (S–W) test produced a statistic of 0.793 with a p-value of 0.000. Since both p-values are less than 0.05, the results indicate that the residuals deviate significantly from a normal distribution. These findings suggest that the normality assumption is not fully satisfied, which may necessitate further diagnostic measures or data transformations to strengthen the robustness of the regression analysis. However, given the large sample size of 248, the central limit theorem provides a reasonable basis for proceeding with the regression analysis, as regression coefficients and significance tests remain asymptotically valid with large samples even under moderate departures from normality.

C. Multicollinearity Test

To examine the effectiveness of ICT process efficiency in enhancing employee performance at Moshi Municipal Council, a multicollinearity test was conducted to determine whether the predictor variables in the regression model were highly correlated, which could undermine the stability and interpretability of the results. Multicollinearity is indicated if the tolerance value falls below 0.1 or the Variance Inflation Factor (VIF) exceeds 10, suggesting potential redundancy among predictors. Table VI presents the multicollinearity diagnostics.

Table VI: Multicollinearity Test

Model	Model	Collinearity Statistics	Collinearity Statistics
Model	Model	Tolerance	VIF
1	(Constant)		
1	Work process speed	.827	1.209
1	Bureaucracy reduction	.971	1.030
	Service quality	.821	1.218
a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance

The results in Table VI show that the multicollinearity test revealed tolerance values above 0.1 and VIF values well below 10 for all predictors: work process speed (Tolerance = 0.827, VIF = 1.209), bureaucracy reduction (Tolerance = 0.971, VIF = 1.030), and service quality (Tolerance = 0.821, VIF = 1.218). These diagnostics confirm that no severe multicollinearity exists among the three ICT process efficiency predictors, ensuring the stability and reliability of the regression coefficients in evaluating employee performance.

D. Residual Statistics

To evaluate the accuracy and reliability of the regression model analysing the effectiveness of ICT process efficiency in enhancing employee performance at Moshi Municipal Council, this study examined residual statistics. Residuals represent the differences between observed and predicted values, providing insights into the model's predictive performance and potential biases. Table VII presents the key residual statistics.

Table VII: Residual Statistics

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	2.5537	4.4250	3.7859	.36812	248
Residual	-1.66677	4.94399	.00000	.69861	248
Std. Predicted Value	-3.347	1.736	.000	1.000	248
Std. Residual	-2.371	7.034	.000	.994	248
a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance

Table VII presents the residual statistics. A minimum residual of −1.667 suggests instances where the model underestimated employee performance, while a maximum residual of 4.944 indicates cases where the model overestimated it. The mean residual of 0.000 shows that, on average, the model's predictions were unbiased and aligned closely with actual values. The standard deviation of the residuals (0.699) reflects the variability in differences between predicted and actual values.

The predicted values ranged

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from 2.554 to 4.425, with a mean of 3.786 and a standard deviation of 0.368, indicating the spread of the model's predictions across the sample.

E. Model Summary

To assess the effectiveness of ICT process efficiency in enhancing employee performance at Moshi Municipal Council, we developed and evaluated a regression model. The model summary provides key metrics including R, R Square, Adjusted R Square, and the standard error of the estimate, which collectively indicate the model's explanatory power and predictive accuracy. Table VIII presents the model summary.

Table VIII: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.466[a]	.517	.508	.70289
a. Predictors: (Constant), Service quality, Bureaucracy reduction, Work process speed	a. Predictors: (Constant), Service quality, Bureaucracy reduction, Work process speed	a. Predictors: (Constant), Service quality, Bureaucracy reduction, Work process speed	a. Predictors: (Constant), Service quality, Bureaucracy reduction, Work process speed	a. Predictors: (Constant), Service quality, Bureaucracy reduction, Work process speed
b. Dependent Variable: Employee performance	b. Dependent Variable: Employee performance	b. Dependent Variable: Employees' performance	b. Dependent Variable: Employees' performance	b. Dependent Variable: Employees' performance

Table VIII shows that the R value of 0.466 indicates a moderate positive correlation between ICT process efficiency and employee performance. The R Square value of 0.517 indicates that the three ICT process efficiency predictors included in the model explain 51.7% of the variance in employee performance. The Adjusted R Square of 0.508 refines this interpretation, suggesting that, after accounting for the number of predictors in the model, ICT process efficiency still retains meaningful explanatory power at 50.8%. The standard error of the estimate of 0.703 represents the average deviation of actual employee performance values from the model's predicted values. These results collectively suggest that while ICT process efficiency dimensions explain a substantive portion of variation in employee performance at Moshi Municipal Council, additional factors beyond the three predictors examined, such as ICT competency, government policy environment, and user experience, likely contribute to the remaining unexplained variance, consistent with the intervening variables identified in the conceptual framework.

F. ANOVA

To determine whether ICT process efficiency significantly affected employee performance at Moshi Municipal Council, an Analysis of Variance (ANOVA) was conducted to test the overall significance of the regression model. This analysis evaluates whether the predictors collectively explain a statistically significant portion of the variance in employee performance. Table IX presents the ANOVA results.

Table IX: ANOVA

Model	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.471	3	11.157	22.583	.013[b]
1	Residual	120.549	244	.494		
1	Total	154.021	247			
a. Dependent Variable: Employee performance	a. Dependent Variable: Employee performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance
b. Predictors: (Constant), Service quality, Bureaucracy reduction, Work process speed	b. Predictors: (Constant), Service quality, Bureaucracy reduction, Work process speed	b. Predictors: (Constant), Service quality, Bureaucracy reduction, Work process speed	b. Predictors: (Constant), Service quality, Bureaucracy reduction, Work process speed	b. Predictors: (Constant), Service quality, Bureaucracy reduction, Work process speed	b. Predictors: (Constant), Service quality, Bureaucracy reduction, Work process speed	b. Predictors: (Constant), Service quality, Bureaucracy reduction, Work process speed

Table IX presents the results of the ANOVA for the model, which examined the relationship between the three ICT process efficiency predictors, namely work process speed, bureaucracy reduction, and service quality, and employee performance at Moshi Municipal Council. The results revealed that the predictors collectively accounted for a statistically significant amount of variation in employee performance. The F-value of 22.583 is associated with a significance value (p-value) of 0.013, which is below the conventional 0.05 threshold. This indicates a statistically significant collective relationship between ICT process efficiency and employee performance at the 0.05 significance level. Therefore, the study rejects the overall null hypothesis, indicating that ICT process efficiency, as operationalised through work process speed, bureaucracy reduction, and service quality, has a statistically significant effect on employee performance at Moshi Municipal Council.

G. Coefficients

To assess the specific influence of individual ICT process efficiency predictors on employee performance at Moshi Municipal Council, a coefficients analysis examined the direction, magnitude, and statistical significance of each predictor's relationship with the dependent variable. Table X presents the coefficients analysis.

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Table X: Coefficients

Model	Model	Unstandardized Coefficients	Unstandardized Coefficients	Standardized Coefficients	t	Sig.
Model	Model	B	Std. Error	Beta	t	Sig.
1	(Constant)	1.795	.260		6.897	.001
1	Work process speed	.058	.054	.067	1.978	.042
1	Bureaucracy reduction	.211	.044	.278	4.844	.001
	Service quality	.257	.054	.297	4.757	.001
a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance	a. Dependent Variable: Employees' performance

Table X presents the coefficients for the predictors in the model, examining the influence of work process speed, bureaucracy reduction, and service quality on employee performance. The analysis shows that work process speed has a positive unstandardised coefficient of 0.058 (Beta = 0.067, t = 1.978, p = .042), indicating a statistically significant, positive relationship with employee performance. This finding implies that as ICT adoption improves the speed at which work processes are completed at Moshi Municipal Council, employee performance improves correspondingly, even though this contribution is comparatively modest relative to the other predictors. On this basis, the null hypothesis H_{01}, which states that ICT process efficiency in work process speed is not statistically significant in enhancing employee performance at Moshi Municipality, is rejected.

Bureaucracy reduction recorded a positive unstandardised coefficient of 0.211 (Beta = 0.278, t = 4.844, p = .001), indicating a strong, positive, and statistically significant relationship with employee performance. This result confirms that as ICT-enabled processes reduce bureaucratic procedures within the municipality's workflows, employee performance improves at a meaningful and statistically demonstrable level. The higher Beta coefficient than work process speed suggests that reducing bureaucracy through ICT has a stronger independent influence on performance outcomes, likely because removing unnecessary procedural steps frees employees to focus on substantive work rather than administrative compliance. The null hypothesis H_{02}, which states that ICT process efficiency in bureaucracy reduction is not statistically significant in enhancing employee performance at Moshi Municipality, is therefore rejected.

Service quality produced the strongest positive and statistically significant coefficient of 0.257 (Beta = 0.297, t = 4.757, p = .001), indicating that ICT-enabled improvements in service quality exert the greatest positive independent influence on employee performance among the three predictors examined. This finding underscores the pivotal role of service quality as both an outcome of and a motivator for employee performance in a municipal service delivery context, where staff performance is ultimately evaluated against the quality of services rendered to citizens. Consequently, the null hypothesis H_{03}, which states that ICT process efficiency in service quality is not statistically significant in enhancing employee performance at Moshi Municipality, is rejected.

The constant term of 1.795 is statistically significant (p = .001), establishing a meaningful baseline level of employee performance in the absence of the modelled ICT process efficiency predictors. Overall, all three predictors, namely work process speed, bureaucracy reduction, and service quality, attained statistical significance at the 0.05 level. Service quality emerged as the strongest driver of employee performance, followed by bureaucracy reduction and work process speed. Consequently, the null hypotheses H_{01}, H_{02}, and H_{03} are all rejected. It is concluded that ICT process efficiency, as operationalised through work process speed, bureaucracy reduction, and service quality, has a statistically significant effect on employee performance at Moshi Municipal Council.

This outcome reinforces the substantive value of ICT process efficiency as documented in the descriptive findings, where positive mean scores were consistently recorded across all ten items in Table 4. It further suggests that while all three ICT process efficiency dimensions are clear and consistent drivers of improved employee performance, the relatively lower explained variance (21.7%) compared to the descriptive patterns indicates that additional factors, including ICT competency, government policies, and user experience, as identified in the conceptual framework, also contribute to employee performance outcomes at Moshi Municipal Council. Fein et al. [2] and Fahmi et al. [13] similarly found that structured ICT process efficiency planning improved employee performance. However, the statistical detectability of specific efficiency categories varied with the analytical model and operating environment studied.

VI. CONCLUSION AND RECOMMENDATIONS

A. Conclusion

Based on the findings of this study, it can be concluded that there is a statistically significant relationship between all three ICT process efficiency predictors, namely work process speed (p = .042), bureaucratic reduction (p = .001), and service quality (p = .001), and employee performance at Moshi Municipal Council. The study further concludes that ICT-enabled process efficiency plays a fundamental role in improving employee performance at Moshi Municipal Council by creating a more efficient and productive working environment. The study demonstrates that when ICT systems are effectively integrated into organisational

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processes, they enhance employees' ability to perform their duties more efficiently through improved service delivery, faster work processes, and streamlined administrative procedures. Nevertheless, the study also establishes that the full benefits of ICT process efficiency have not yet been fully realised because organisational and regulatory barriers continue to limit the complete digitalisation of some administrative processes. Therefore, while ICT process efficiency is an important driver of employee performance, sustained improvements will depend not only on continued investment in ICT infrastructure but also on institutional reforms, supportive policies, continuous staff capacity development, and effective monitoring mechanisms that ensure ICT investments translate into measurable performance outcomes.

B. Recommendations

Based on the conclusions of this study, the following recommendations are made: the Moshi Municipal Council could strengthen the integration of ICT into all operational processes by continuously upgrading digital infrastructure, expanding the use of integrated electronic systems, and establishing performance monitoring mechanisms that regularly evaluate whether ICT investments are improving employee performance and service delivery. The Government, through the relevant ministries and regulatory authorities, may review and harmonise existing administrative procedures and legal frameworks to support wider adoption of electronic approvals, digital signatures, and paperless workflows. This will minimise unnecessary bureaucratic procedures that continue to reduce the effectiveness of ICT systems.

The municipality could institutionalise continuous, role-specific ICT capacity-building programmes to ensure employees have the knowledge and skills to use ICT systems effectively. Regular refresher training and technical support could maximise employee confidence, improve system utilisation, and sustain performance improvements. Future studies may examine other factors that influence employee performance beyond ICT process efficiency, such as organisational culture, leadership practices, employee ICT competency, and organisational readiness for digital transformation. Longitudinal studies involving multiple local government authorities are also recommended to determine the long-term effects of ICT process efficiency on employee performance and public service delivery.

DECLARATION STATEMENT

Some of the cited references are older and are noted explicitly as **[16]**. However, these works remain significant for the current study, as they are pioneering in their fields.

After aggregating input from all authors, I must verify the accuracy of the following information as the article's author.

- **Conflicts of Interest/ Competing Interests:** Based on my understanding, this article has no conflicts of interest.
- **Funding Support:** This article has not been sponsored or funded by any organization or agency.
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- **Author's Contributions:** The authorship of this article is contributed equally by all participating individuals.

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