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Digital Transformation and Municipal Service Performance in Jordan: The Role of E-Government Adoption, Citizen Engagement, and Organizational Capacity

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Abstract

Digital transformation has become a central mechanism for improving public administration, service quality, citizen access, and institutional efficiency. In Jordan, municipal government represents a particularly important setting for examining digital transformation because municipalities provide services that directly affect residents, businesses, infrastructure, licensing, local planning, and everyday administrative transactions. This paper examines municipal digital transformation through three closely connected dimensions: e-government adoption, citizen engagement, and organizational capacity, while also considering perceived municipal service performance and the relationship between digital transformation and broader economic modernization. The paper is developed from the empirical foundation of the source thesis, which used a quantitative cross-sectional survey and a structured five-point Likert questionnaire. Seventy-two questionnaires were distributed and 46 valid responses were obtained, producing a 63.89% response rate. The empirical setting included major urban, governorate-centre, and smaller or rural municipal contexts, including Amman, Irbid, and Zarqa. The analysis comprised descriptive statistics, factor analysis, reliability testing, multicollinearity diagnostics, and regression analysis. The findings indicate generally positive perceptions of e-government implementation, adoption, and municipal service improvement. Service-delivery indicators showed positive perceptions of faster service, fewer operational errors, greater citizen satisfaction, and lower administrative costs. At the same time, financial limitations, technical infrastructure, staff skills, and citizen digital literacy remained important barriers. The reported regression models show statistically significant relationships between implementation level, adoption rate, service delivery enhancement, and economic modernization alignment. Service delivery enhancement had the strongest reported association ($R=.590$; $R^2=.348$; $p<.001$), followed by implementation level ($R=.526$; $R^2=.277$; $p=.020$) and adoption rate ($R=.486$; $R^2=.237$; $p=.023$). Implementation barriers were inversely related to modernization alignment ($R=.560$; $R^2=.314$; $p<.001$). The paper argues that municipal digital transformation should therefore be understood as an organizational and service-performance transformation rather than as the simple introduction of digital tools.

Keywords: digital transformation; e-government; municipal services; service performance; citizen engagement; organizational capacity; Jordan; digital governance; economic modernization.

Chapter One: Introduction

1.1 Introduction

The transformation of public services through digital technologies has moved from a peripheral administrative reform to a core component of contemporary government modernization. E-government allows public institutions to use information and communication technologies to redesign administrative processes, make information available through digital channels, automate selected transactions, and improve the interaction between government and citizens. The significance of this transformation is especially strong where public institutions are responsible for high volumes of routine services, because even modest improvements in processing time, accuracy, accessibility, and coordination can generate meaningful benefits for service users and administrative organizations (Davis, 1989; Rogers, 2003).

In Jordan, e-government has developed within a broader modernization agenda. The source thesis identifies the national e-Government Program established in 2001 as an important starting point for systematic government use of ICT. Subsequent initiatives have expanded digital infrastructure, electronic services, interoperability, institutional capabilities, and citizen access. Research on Jordan continues to show, however, that the existence of electronic services does not automatically mean that digital transformation has been fully achieved. Adoption, trust, awareness, usability, infrastructure, organizational readiness, and human capacity remain important conditions for successful implementation (Almaiah & Nasereddin, 2020; Al-Haddad et al., 2023; Alryalat et al., 2023).

Municipalities are an important arena for examining these conditions because they are among the government institutions most directly connected with citizens' everyday needs. Municipal services include planning, licensing, infrastructure-related activities, local environmental services, public facilities, permits, fees, and other transactions. The quality of these services influences' citizens' perceptions of public administration and can also affect local economic activity. Digital transformation at the municipal level therefore has both administrative and developmental significance.

The present paper takes a service-performance perspective. It does not assume that every digital initiative produces a causal improvement in performance. Instead, it examines the empirical evidence contained in the source research and interprets service performance as a multidimensional outcome associated with digital implementation, actual adoption, organizational capacity, and barriers. This distinction is important because a municipality may possess digital platforms while still relying on manual procedures, fragmented systems, or face-to-face verification. Similarly, citizens may have access to an online service but use it only occasionally if they do not trust the system, lack digital skills, or find the process difficult.

Recent Jordanian research supports the importance of this distinction. Studies of municipal digital transformation identify information systems, technical equipment, staff qualification, legal and regulatory support, financial capacity, and organizational arrangements as important components of successful transformation. Other studies identify weak financial capacity, insufficient technical training, inadequate infrastructure, and organizational challenges as persistent obstacles (Ataya, 2023;

Alkayed, 2023; Alshibli, 2023). A 2024 study of Manshiyat Bani Hasan Municipality also examined e-government implementation through access, efficiency, trust, security, and satisfaction, demonstrating the growing interest in connecting digital transformation with citizens' experience rather than technology alone.

1.2 Background of the Study

Digital government has evolved through several stages. Early e-government initiatives frequently focused on providing information online. Later stages introduced electronic forms, transactional services, electronic payment, integrated databases, mobile applications, and increasingly data-driven administrative processes. The contemporary concept of digital transformation extends beyond placing existing procedures online. It involves redesigning processes around digital capabilities, integrating information across organizational boundaries, improving decision-making, and creating services that are accessible through multiple channels.

This evolution is relevant to Jordanian municipalities because traditional administrative procedures may remain embedded even when digital interfaces are introduced. If an online application still requires repeated physical visits, manual signatures, disconnected records, or duplicate data entry, the apparent digital service may not produce the expected improvement in performance. Digital transformation therefore requires process redesign as well as technology acquisition. The municipal studies reviewed for this paper repeatedly emphasize this requirement.

The economic dimension is also important. Faster and more predictable administrative transactions can reduce the time citizens and businesses spend dealing with public institutions. Reduced errors can decrease rework and administrative costs. Better access to information can increase transparency and reduce uncertainty. Integrated digital systems can improve coordination between municipal units and potentially strengthen the ability of local government to monitor performance. These effects connect municipal digitalization with wider modernization objectives, even when the immediate purpose of a digital service is administrative rather than explicitly economic.

At the same time, digital transformation can create new risks and inequalities. Citizens who have limited digital literacy, poor connectivity, disability-related access needs, or limited trust in digital systems may benefit less than highly connected users. Smaller municipalities may face greater difficulty financing infrastructure and training. Employees may resist new procedures if digital transformation is perceived as a threat to established roles or if they are not adequately trained. Consequently, digital transformation is simultaneously a technological, organizational, financial, and social process.

The source thesis operationalized this complexity through five constructs: e-government implementation level, e-government adoption rate, service delivery enhancement, implementation barriers, and economic modernization alignment. Each construct contained four measurement items. The present paper reorganizes the interpretation around service performance, citizen engagement, and organizational capacity while retaining the original empirical measurements and statistical results. This approach makes the paper analytically distinct without inventing new coefficients or presenting untested causal relationships.

1.3 Problem Statement

Despite the expansion of digital government in Jordan, a persistent problem is the uneven conversion of technological investment into consistent improvements in municipal service performance. The source thesis identifies a gap between technological capabilities and actual service outcomes. Municipalities may introduce websites, electronic platforms, information systems, or digital transaction channels without fully eliminating traditional bureaucratic procedures. Where systems are fragmented or employees and citizens are insufficiently prepared, the potential benefits of digitalization may not be realized.

The problem is particularly relevant at the municipal level because municipalities operate under different financial, technical, organizational, and demographic conditions. A large urban municipality may have stronger infrastructure and specialized staff than a smaller municipality, while rural communities may experience different connectivity and digital-literacy conditions. Consequently, national digital-government policies can produce uneven local implementation.

Citizen engagement is another part of the problem. Digital services are useful only when citizens can and do use them. Availability therefore differs from adoption. A service can be technically available but practically underused because of limited awareness, low perceived usefulness, lack of trust, complicated interfaces, or preference for traditional channels. Jordanian adoption research has identified usefulness, trust, awareness, self-efficacy, perceived risk, social influence, and resistance to change as relevant factors (Alryalat et al., 2023; Al-Haddad et al., 2023).

Organizational capacity creates a parallel challenge. Municipal employees need technical competence, managerial support, suitable infrastructure, financial resources, and clear processes. The source research identifies staff digital skills, technical infrastructure, financial resources, and citizen digital literacy among the principal barriers. These conditions suggest that municipal digital transformation cannot be treated as an IT department project alone; it requires institutional coordination and sustained organizational change.

1.4 Research Gap

Previous research on Jordanian e-government has generated valuable evidence about adoption, behavioral acceptance, trust, digital transformation, and the availability of municipal electronic services. However, much of the literature examines one part of the transformation process at a time. Citizen adoption studies explain why users accept or resist digital services, while municipal transformation studies frequently describe requirements and obstacles. A smaller body of work connects implementation conditions, actual adoption, service-delivery improvement, and broader modernization outcomes within one empirical framework.

The present paper addresses this gap by integrating these dimensions conceptually. It places service performance at the centre while recognizing that performance is influenced by the interaction between technology and organizational and social conditions. This approach is consistent with the evidence in the source thesis, which measured implementation, adoption, service delivery, barriers, and modernization alignment within the same survey instrument.

A second gap concerns interpretation. Digital transformation should not be evaluated solely through the number of services that become electronic. The relevant question is whether digital systems change the quality and efficiency of the service process. The paper therefore emphasizes speed, accuracy, satisfaction, and administrative cost as service-performance indicators. These indicators are directly supported by the source questionnaire and descriptive findings.

1.5 Research Objectives

- To examine the current level of e-government implementation in Jordanian municipal contexts.
- To assess perceived changes in municipal service performance associated with digital service implementation.
- To examine the role of e-government adoption, including citizen and staff use of digital platforms.
- To identify organizational, technical, financial, and digital-literacy barriers affecting municipal digital transformation.
- To interpret the relationship between municipal digital transformation and broader economic modernization alignment.
- To develop practical implications for improving municipal digital-service performance without overstating causal evidence.

1.6 Research Questions

- What is the perceived level of e-government implementation in the municipal contexts examined by the study?
- How do respondents perceive the effect of digital transformation on municipal service performance?
- How important are citizen and staff adoption to the practical success of municipal digital services?
- What organizational, technical, financial, and digital-literacy barriers constrain municipal digital transformation?
- How are implementation, adoption, service-delivery enhancement, and barriers statistically related to economic modernization alignment in the reported empirical models?

1.7 Research Propositions and Analytical Orientation

The source thesis formulated hypotheses concerning the contribution of e-government implementation to modernization and the importance of organizational capacity. In the present paper, these propositions are retained as an analytical orientation rather than converted into new causal claims. The empirical models reported in the source research predict economic modernization alignment, not municipal service performance itself. Accordingly, the paper treats the service-performance findings as descriptive evidence and uses the regression results to show how service delivery, implementation, adoption, and barriers relate to modernization alignment.

This distinction protects the integrity of the evidence. The data support statistically significant associations between the measured constructs and modernization alignment, but they do not justify

claiming that a specific digital intervention caused a particular percentage improvement in municipal service performance. Such causal inference would require longitudinal or experimental evidence. The paper therefore uses cautious language such as association, relationship, perceived improvement, and reported outcome.

1.8 Significance of the Study

The study is significant theoretically because it connects technology adoption perspectives with public-management and organizational-capacity perspectives. E-government is not simply a technological artifact; it is an institutional innovation that requires acceptance by users and adaptation by organizations. TAM helps explain perceived usefulness and ease of use, Diffusion of Innovations explains the spread of innovation, and New Public Management highlights efficiency, responsiveness, and performance.

Practically, the study is relevant to municipal managers, national public-administration institutions, technology units, and policymakers responsible for local service modernization. The findings suggest that investment should be balanced across digital infrastructure, employee capability, citizen awareness, integration, process redesign, and financial sustainability. A municipality that invests heavily in platforms but neglects staff training or user support may obtain weaker returns than expected.

From a citizen perspective, the study highlights the importance of designing digital services around actual service journeys. The objective should not simply be to create an online form, but to reduce unnecessary steps, provide clear information, enable secure transactions, communicate status, and offer accessible support. Citizen engagement should therefore be treated as a performance condition rather than as an optional communication activity.

1.9 Scope and Delimitations

The paper focuses on municipal digital transformation in Jordan and draws on the quantitative empirical foundation of the source thesis. The municipal contexts represented in the source research include Amman, Irbid, Zarqa, and smaller or rural settings. The study population consists of municipal personnel involved in administrative and service-delivery processes. The analysis concerns perceived implementation, adoption, service delivery, barriers, and modernization alignment. It does not claim to provide a nationally representative estimate for every municipality or every citizen group in Jordan.

A major delimitation is that the regression analysis in the source study uses economic modernization alignment as the dependent outcome. The paper therefore does not report invented regression models in which municipal service performance is the dependent variable. Service performance is interpreted from the descriptive measures and from the conceptual relationship among the constructs.

Chapter Two: Literature Review and Theoretical Framework

2.1 Introduction

The literature on digital government increasingly treats transformation as a socio-technical process. Technology creates new capabilities, but organizational structures determine whether those

capabilities are embedded in work processes, citizens determine whether services are adopted, and institutional arrangements determine whether systems can be sustained. This chapter reviews the major concepts relevant to municipal digital transformation in Jordan and establishes the theoretical basis for the empirical interpretation.

The review begins with e-government and digital transformation, then examines municipal service delivery, adoption, citizen engagement, organizational capacity, digital inclusion, trust, interoperability, and emerging technologies. It concludes by linking these themes to New Public Management, the Technology Acceptance Model, and Diffusion of Innovations.

2.2 E-Government: Concept and Development

E-government refers to the use of ICT to improve government operations and interactions with citizens, businesses, employees, and other public institutions. Davis's (1989) technology-acceptance perspective helps explain why usefulness and ease of use matter to adoption, while broader public-administration perspectives emphasize efficiency, transparency, responsiveness, and accountability. E-government can therefore be understood both as a technology-enabled service model and as an administrative reform.

In Jordan, e-government development has progressed from early online information provision toward broader electronic transactions and digital public services. The source thesis identifies the 2001 national e-Government Program as a foundational initiative. Subsequent research has continued to examine the country's adoption challenges, including trust, awareness, user experience, infrastructure, and organizational readiness.

Jordanian adoption research demonstrates that citizens' intentions are influenced by multiple factors. Alryalat et al. (2023) found that relative advantage, perceived trust, computer self-efficacy, and awareness were positively associated with behavioral intentions, while resistance to change was negatively related. Al-Haddad et al. (2023) likewise examined behavioral acceptance of electronic government in Jordan. These findings support the view that e-government success depends on user perceptions as well as system availability.

The municipal context adds another layer. Municipal digital services are often transactional and locally relevant, so users may judge them directly by convenience, speed, clarity, and reliability. A digital system that does not reduce effort may not be perceived as a meaningful improvement even when it is technically sophisticated.

2.3 Digital Transformation in Municipal Government

Digital transformation is broader than e-government because it includes organizational redesign, data integration, new service models, digital skills, and changes in institutional culture. A transformation occurs when digital capabilities alter how an organization creates and delivers value rather than merely reproducing an existing manual process on a screen.

Alkayed (2023) identified information systems and electronic services, technical equipment, human-resource qualification, and supportive laws and regulations as important requirements for digital transformation in Jordanian municipalities. The study also associated digital transformation with

improved service pathways, electronic transactions, reduced need for physical attendance, and stronger information protection. These themes are consistent with the source thesis.

Ataya (2023) similarly identified human, material, administrative, technical, and financial requirements and emphasized weak financial capacity, insufficient staff training, and inadequate technical requirements as prominent barriers. The evidence indicates that municipal transformation is constrained not by one missing technology but by the interaction of multiple institutional conditions.

The broader implication is that municipalities need a transformation portfolio rather than a single project. The portfolio may include service redesign, infrastructure modernization, interoperability, cybersecurity, staff training, citizen support, governance arrangements, and performance measurement.

2.4 Municipal Service Delivery and Performance

Service performance is a practical lens for assessing whether digital transformation produces public value. In municipal government, relevant indicators include processing time, accuracy, administrative cost, accessibility, responsiveness, and citizen satisfaction. These dimensions are particularly appropriate because they connect digital implementation to outcomes that users and managers can observe.

The source questionnaire measured service delivery enhancement through four items: faster service delivery, reduction of operational errors, increased citizen satisfaction, and lower administrative costs. This measurement structure is important because it avoids defining performance exclusively as technological sophistication. A municipality may have advanced software but weak performance if transactions remain slow or error-prone.

Jordanian municipal studies provide supporting context. Abu-Dhila's 2023 case study of Kufranja New Municipality reported a moderate perception of electronic services among 198 service recipients and recommended expanding and improving digital services. Jaafra (2023) likewise emphasized digitalization as a mechanism for improving municipal service quality. These findings suggest that the direction of transformation is clear, while the level and consistency of implementation remain important issues.

Nawafleh (2022) examined development programs and service efficiency in Jordan's public sector and reported a moderating role for e-government. This supports the idea that digital government can strengthen service efficiency when embedded within wider development and administrative processes.

2.5 E-Government Adoption

Implementation and adoption are conceptually different. Implementation refers to the institutional provision and operational deployment of digital services, whereas adoption concerns actual use by intended users. The distinction is central to digital transformation because unused systems create limited public value.

The Technology Acceptance Model explains adoption through perceived usefulness and perceived ease of use (Davis, 1989). Diffusion of Innovations adds the idea that innovations spread through social systems at different rates depending on perceived characteristics, communication, social influence, and organizational context (Rogers, 2003). Jordanian studies extend these perspectives through variables such as trust, awareness, perceived risk, self-efficacy, social influence, and resistance to change.

In the source research, adoption was measured through availability of online services, citizen platform usage, staff digital adoption, and growth in adoption. The descriptive findings were favorable: online service availability had a mean of 4.3, citizen platform usage 4.1, staff digital adoption 4.0, and adoption growth 4.1. These figures suggest that respondents perceived adoption as relatively strong within the studied contexts, while the barrier results indicate that digital literacy and staff skills remained relevant constraints.

2.6 Citizen Engagement and User-Centred Government

Citizen engagement in digital government is broader than the frequency of logins. It includes awareness, ability to use services, confidence in digital channels, feedback, participation in service improvement, and willingness to continue using electronic services. A citizen-centred approach therefore evaluates digital government from the user's service journey.

Trust is central because electronic government transactions frequently involve personal information, payments, official documents, and administrative decisions. Abdulkareem and Mohd Ramli (2022) link trust with e-government performance through information-system success and public-value perspectives. Jordanian adoption studies similarly identify trust and awareness as important factors.

Citizen engagement also depends on usability. Ahmad and Dhoon (2024) examined user experience and satisfaction with e-government applications in Jordan, illustrating the importance of service design. If citizens experience confusing interfaces, incomplete information, repeated data requests, or uncertain transaction status, adoption can decline even where the service is technically functional.

The municipal implication is that citizens should be involved in service design and evaluation. Municipalities can use user feedback, complaint data, service-completion rates, abandonment rates, and satisfaction surveys to identify where digital journeys fail. Engagement should therefore be connected to operational performance.

2.7 Organizational Capacity

Organizational capacity refers to the ability of an institution to mobilize people, processes, technology, finance, leadership, and governance arrangements to achieve intended outcomes. In digital transformation, capacity determines whether technology can be integrated into everyday operations.

The source research identifies staff skills, technical infrastructure, financial resources, strategy, and integration as important dimensions. The descriptive barrier results show that staff digital skills, technical infrastructure, citizen digital literacy, and financial resources were all perceived as meaningful constraints. This is consistent with municipal research in Jordan, where insufficient training and limited financial and technical capacity are repeatedly identified.

Organizational capacity also includes change management. Digital transformation changes roles, workflows, accountability, and information flows. Employees may resist if transformation is imposed without training or if performance expectations are unclear. Conversely, leadership support, participation, and continuous training can reduce resistance and improve adoption.

Capacity should therefore be built progressively. Municipalities can prioritize high-volume services, standardize processes, create internal digital champions, establish support teams, and use performance dashboards. These actions are more sustainable than relying exclusively on external technology vendors.

2.8 Digital Divide and Inclusion

The digital divide is not limited to whether an internet connection exists. It includes differences in access to devices, connectivity quality, digital skills, affordability, awareness, confidence, and the ability to use digital services effectively. Masadeh et al. (2023) demonstrate the relevance of the digital divide to e-government adoption intentions in Jordan.

Municipal digital transformation can unintentionally exclude citizens if services become digital-only without alternative support. Rural communities, older users, people with disabilities, and citizens with limited digital literacy may require assisted digital channels. A balanced approach combines digital-first service design with accessible support mechanisms.

The source thesis directly includes low digital literacy as an implementation barrier. This is significant because it places citizens within the implementation system rather than treating them as passive recipients. Digital literacy programs, public guidance, simplified interfaces, and community support can therefore be considered part of municipal digital infrastructure.

2.9 Infrastructure, Interoperability, and Information Security

Technical infrastructure is the foundation on which digital services operate. Connectivity, server capacity, cloud or data-centre arrangements, cybersecurity, data management, backup systems, and endpoint equipment all affect service reliability. However, infrastructure alone does not create integrated government.

Interoperability is particularly important because municipal services often depend on information held by different departments or external institutions. If systems cannot exchange data securely, citizens may be required to provide the same information repeatedly. Integrated systems can reduce duplication and improve processing efficiency, but integration requires common standards, governance, and sustained investment.

Information security and privacy are equally important. Trust can be damaged by service outages, data breaches, unclear privacy practices, or inaccurate records. Digital transformation should therefore incorporate access controls, authentication, data governance, incident response, backup, and staff awareness. These are not purely technical issues; they are organizational responsibilities.

2.10 Financial and Institutional Barriers

Financial constraints can slow digital transformation through limited budgets for infrastructure, software, maintenance, training, cybersecurity, and system upgrades. Ataya (2023) and Alshibli

(2023) both identify financial capacity as a major municipal challenge. The implication is not that municipalities should postpone transformation until unlimited resources become available, but that investment should be prioritized according to service value and sustainability.

Institutional barriers may include unclear responsibility, fragmented decision-making, weak strategic planning, resistance to change, insufficient coordination, and limited partnerships. Alshibli (2023) emphasizes the need for strategic planning, specialized electronic-management units, capacity building, and appropriate technical and administrative requirements. These recommendations reinforce the organizational-capacity argument of the present paper.

2.11 Emerging Technologies and Smart Municipal Government

Emerging technologies such as artificial intelligence, mobile government, data analytics, automation, and smart-city platforms can expand municipal digital capabilities. Jordanian research has begun to examine artificial intelligence in relation to the quality of e-government services. However, emerging technology should be adopted only when it addresses a clearly defined administrative or citizen problem.

AI can support document classification, service routing, chat-based assistance, forecasting, and anomaly detection, but these applications require high-quality data, governance, staff capabilities, and clear accountability. A municipality that has not solved basic interoperability or service-process problems may gain less from advanced AI than from simpler workflow redesign.

The appropriate progression is therefore maturity-based: establish reliable infrastructure, digitize high-value services, integrate data, improve user experience, strengthen governance, and then deploy advanced analytics and AI where they create demonstrable value.

2.12 Theoretical Framework

2.12.1 New Public Management Theory

New Public Management (NPM) emphasizes performance, efficiency, managerial responsibility, responsiveness, and service quality. Although digital government cannot be reduced to NPM, many digital reforms are compatible with its emphasis on measurable performance and improved service delivery.

In the municipal context, NPM helps explain why digital transformation is expected to reduce administrative burden, shorten processing time, improve monitoring, and increase responsiveness. The service-performance indicators in the source study—speed, accuracy, satisfaction, and cost—are consistent with this performance orientation.

2.12.2 Technology Acceptance Model

Davis's (1989) Technology Acceptance Model proposes perceived usefulness and perceived ease of use as key determinants of technology acceptance. For municipal services, usefulness can mean saving time, reducing visits, simplifying procedures, or obtaining information quickly. Ease of use concerns the clarity and effort required to complete a transaction.

TAM supports the interpretation that citizen engagement is not simply a technical outcome. A service that is difficult to use or perceived as unnecessary may experience low adoption. The source adoption

construct includes citizen platform usage and staff digital adoption, making TAM a useful theoretical lens.

2.12.3 Diffusion of Innovations Theory

Rogers' (2003) Diffusion of Innovations theory explains how innovations spread across organizations and social systems. Adoption may vary because users perceive innovations differently and because organizational contexts differ.

For municipalities, diffusion theory helps explain why digital transformation may progress at different speeds under the same national policy framework. Differences in leadership, resources, employee readiness, citizen literacy, infrastructure, and perceived advantage can shape the pace of adoption.

2.13 Conceptual Framework

The conceptual framework positions e-government implementation as the technological and institutional foundation, e-government adoption and citizen engagement as the use-oriented mechanism, and organizational capacity as the enabling condition. These factors are expected to be associated with improved municipal service performance. Implementation barriers are expected to weaken the realization of these benefits. The original empirical analysis additionally tests the relationship of implementation, adoption, service delivery enhancement, and barriers with economic modernization alignment.

Dimension	Core indicators in the source research	Interpretive role in this paper
E-Government Implementation	Strategy; digital services; infrastructure updates; integrated solutions	Digital and institutional foundation
E-Government Adoption	Online availability; citizen usage; staff adoption; adoption growth	Actual use and diffusion
Service Delivery Enhancement	Speed; accuracy; citizen satisfaction; administrative cost	Municipal service performance
Implementation Barriers	Financial resources; infrastructure; staff skills; digital literacy	Constraints on transformation
Economic Modernization Alignment	Vision support; national-plan coordination; business climate; transformation alignment	Broader development outcome

2.14 Review of Previous Jordanian Studies

Study	Context / approach	Main contribution
Almaiah & Nasereddin (2020)	Jordanian citizens; e-government adoption	Explains factors influencing citizen adoption.

Rabaai (2015)	Jordan; e-government adoption	Provides earlier evidence on adoption in a developing-country context.
Al-Haddad et al. (2023)	Jordan; behavioral acceptance	Examines acceptance of electronic government.
Alryalat et al. (2023)	Jordan; citizen perspective	Highlights relative advantage, trust, self-efficacy and awareness.
Ataya (2023)	Jordanian municipalities; descriptive study	Identifies financial, technical and training barriers.
Alkayed (2023)	Jordanian municipalities; digital transformation	Emphasizes systems, equipment, human resources and regulations.
Abu-Dhila (2023)	Kufranja New Municipality; 198 service recipients	Reports moderate perceptions of electronic services.
Alshibli (2023)	Jordanian municipalities; obstacles	Highlights financial, technical, administrative and capacity barriers.
AlShdaifat (2024)	Manshiyat Bani Hasan Municipality; 38 residents	Connects digital transformation with access, efficiency, trust and satisfaction.

Taken together, these studies show a consistent pattern: Jordan has a meaningful foundation for digital government, but municipal outcomes depend on more than technology availability. The literature supports an integrated interpretation involving user adoption, organizational capability, infrastructure, financial sustainability, and service quality.

2.15 Integrated Interpretation of the Literature

An integrated reading of the literature suggests that municipal digital transformation operates through a chain of mutually dependent conditions. The first condition is institutional intent: municipal leaders must recognize digital transformation as a strategic priority rather than as a temporary technology project. The second is implementation capacity, including infrastructure, systems, processes, funding, and employee skills. The third is adoption, because digital services create limited value when citizens and employees do not use them. The fourth is service performance, where the value of digital transformation becomes visible through speed, accuracy, satisfaction, accessibility, and cost. The fifth is sustainability, which requires continuous investment, governance, and adaptation.

This chain also explains why a municipality may appear digitally advanced while still experiencing service problems. A polished website does not guarantee integrated back-office systems. A mobile application does not guarantee citizen adoption. A successful pilot does not guarantee organization-wide capability. The literature therefore supports an outcome-oriented approach in which technology is evaluated by the operational change it enables.

The source research is particularly useful because it measures these dimensions together. Its five constructs provide a practical bridge between the literature and empirical analysis. Implementation

captures strategic and technical foundations; adoption captures use; service delivery enhancement captures practical outcomes; barriers capture constraints; and modernization alignment captures the broader policy context.

From a public-management perspective, this integrated framework also helps avoid two opposite mistakes. The first is technological determinism—the assumption that technology automatically improves government. The second is organizational pessimism—the assumption that existing bureaucracy makes digital transformation ineffective. The empirical findings show a more balanced picture: meaningful improvements can occur, but they require institutional and human conditions that support the technology.

Chapter Three: Methodology

3.1 Research Design

The source study employed a quantitative, cross-sectional research design. This design was appropriate for measuring perceptions across defined constructs and examining statistical relationships among them. A cross-sectional survey provides a standardized snapshot of implementation and perceived outcomes at a particular point in time.

The present paper retains that design and does not introduce new data. Its contribution is analytical reorganization of the existing empirical foundation around municipal service performance, citizen engagement, and organizational capacity. The study therefore remains an observational survey rather than an experimental or longitudinal investigation.

3.2 Population, Sampling, and Context

The source research considered municipal contexts including large urban municipalities, governorate-centre municipalities, and smaller or rural municipalities. Amman, Irbid, and Zarqa were represented alongside smaller settings. The sampling strategy was described as stratified random sampling to capture differences in municipal context.

Seventy-two questionnaires were distributed and 46 valid responses were obtained, yielding a response rate of 63.89%. Of the valid respondents, 17 were top-level executives (36.96%) and 29 were middle-level executives (63.04%). The educational profile was relatively strong, with 54.35% holding a university degree and 28.26% reporting postgraduate education. These characteristics suggest that respondents were positioned to comment on organizational and service-delivery conditions, although the sample size limits broad generalization.

Item	Result
Questionnaires distributed	72
Valid responses	46
Response rate	63.89%
Top-level executives	17 (36.96%)
Middle-level executives	29 (63.04%)
University degree	54.35%

Postgraduate education	28.26%
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3.3 Data Collection Instrument

Data were collected using a structured questionnaire based on a five-point Likert scale from 1 = strongly disagree to 5 = strongly agree. The instrument included demographic information and five principal constructs, each measured with four items.

The five constructs were E-Government Implementation Level, E-Government Adoption Rate, Service Delivery Enhancement, Implementation Barriers, and Economic Modernization Alignment. The instrument was designed to distinguish implementation conditions from perceived outcomes. This distinction allows a municipality to be assessed not only by what it has implemented but also by whether users adopt services and whether service performance is perceived to improve.

3.4 Measurement Structure

Construct	Items	Measurement focus
E-Government Implementation Level	4	Strategy, digital services, infrastructure updates, integration
E-Government Adoption Rate	4	Online availability, citizen use, staff adoption, adoption growth
Service Delivery Enhancement	4	Speed, accuracy, satisfaction, administrative cost
Implementation Barriers	4	Financial, technical, staff skills, citizen digital literacy
Economic Modernization Alignment	4	Vision support, national-plan coordination, business climate, transformation alignment

3.5 Data Analysis

The source research used descriptive statistics to summarize responses, factor analysis to assess the measurement structure, Cronbach's alpha to assess internal consistency, multicollinearity diagnostics to evaluate overlap among explanatory constructs, and regression analysis to examine reported relationships with economic modernization alignment.

Factor loadings ranged from .565 to .866 across the constructs. Reliability values were acceptable to strong, with Cronbach's alpha values of .723 for implementation level, .911 for adoption rate, .841 for service delivery enhancement, .878 for implementation barriers, and .712 for economic modernization alignment.

Multicollinearity diagnostics also remained within conventional screening ranges. Tolerance values ranged from .342 to .765 and VIF values from 1.308 to 2.924. These results do not indicate severe multicollinearity in the reported models.

Construct	Cronbach's alpha	Interpretation
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Implementation Level	.723	Acceptable internal consistency
Adoption Rate	.911	Very strong internal consistency
Service Delivery Enhancement	.841	Strong internal consistency
Implementation Barriers	.878	Strong internal consistency
Economic Modernization Alignment	.712	Acceptable internal consistency

3.6 Validity and Measurement Considerations

The factor analysis results provide evidence that the items grouped coherently around their intended constructs. For example, service-delivery indicators had factor loadings from .565 to .861, while adoption indicators ranged from .613 to .866. These results support the use of the constructs for descriptive and relational analysis.

Nevertheless, the sample size of 46 valid cases is modest. Factor analysis and regression estimates based on a small sample should be interpreted cautiously. The results are useful as evidence from the studied respondents but should not be treated as definitive population parameters for all Jordanian municipalities.

3.7 Ethical and Research-Integrity Considerations

The paper does not introduce new respondents or new measurements. It reports the empirical results contained in the source research and explicitly distinguishes descriptive service-performance findings from regression relationships whose dependent variable is economic modernization alignment. This distinction is important for research integrity because it prevents the reinterpretation from becoming an unsupported re-analysis.

3.8 Methodological Limitations

The cross-sectional design limits the ability to establish temporal order or causality. Perceptions of better service performance cannot by themselves demonstrate that digital transformation caused the improvement.

The sample is relatively small and consists of municipal personnel rather than a large citizen sample. Consequently, the results primarily reflect organizational perceptions. Citizen engagement is represented through the citizen-use indicators contained in the questionnaire, not through a separate large-scale citizen survey.

The paper is based on the variables and statistical models of the source thesis. It does not reconstruct new regression equations or create coefficients for relationships that were not tested in the original research.

3.9 Operationalization of Citizen Engagement

Although the source questionnaire did not create a separate multi-item scale labelled Citizen Engagement, citizen engagement is represented within the adoption and service-performance

measures. In particular, citizen platform usage captures actual interaction with digital services, while citizen satisfaction provides an outcome-oriented indicator of the quality of that interaction. This operational approach should be acknowledged explicitly so that the construct is not overstated.

Citizen engagement in this paper therefore refers to the practical participation of service users in digital channels through awareness, access, usage, and satisfaction. It does not imply political participation or democratic deliberation. This narrower definition is consistent with the municipal-service focus of the research.

The distinction is important for future research. A dedicated citizen-engagement scale could measure awareness of available services, frequency of use, feedback behavior, trust, willingness to recommend digital services, participation in co-design, and use of complaint or consultation channels. Such measures would provide a more comprehensive picture of the citizen side of digital transformation.

3.10 Operationalization of Organizational Capacity

Organizational capacity is similarly treated as a multidimensional construct rather than as a single questionnaire scale. The source research captures relevant elements through implementation, adoption, and barrier indicators. These include strategic planning, infrastructure updates, system integration, staff digital adoption, financial resources, technical readiness, and staff skills.

This approach reflects the reality of municipal digital transformation. Capacity is not simply the number of IT employees. It includes leadership commitment, process knowledge, ability to coordinate departments, financial planning, data governance, technical support, and the ability to manage organizational change.

Future studies could formalize organizational capacity as a dedicated latent construct and test its direct and moderating effects using a larger sample. Such a design could determine whether municipalities with stronger organizational capacity convert digital investments into service improvements more effectively.

Chapter Four: Results

4.1 Overview of Findings

The empirical results present a generally positive picture of municipal digital transformation while also revealing persistent structural constraints. Respondents reported relatively strong levels of strategy, adoption, service improvement, and modernization alignment. At the same time, financial resources, technical infrastructure, staff skills, and citizen digital literacy were identified as significant barriers. The statistical results indicate significant relationships between the explanatory constructs and economic modernization alignment.

4.2 E-Government Implementation Level

The implementation findings indicate that strategic commitment was relatively strong. Eighty-seven percent of respondents agreed or strongly agreed that their municipality had a dedicated e-government

strategy, producing a mean of 4.2. This suggests that digital transformation had moved beyond an entirely ad hoc activity and had become part of organizational planning.

Perceptions were more moderate regarding the comprehensiveness of digital services, with a mean of 3.0. This difference between strategic commitment and breadth of digital services is analytically important. A municipality can have a strategy without all major service processes being fully digitized.

Infrastructure updates received a mean of 3.8, with 71.8% reporting positive responses. Integrated digital solutions received a mean of 3.7, with 65.2% positive responses. The findings therefore suggest progress in infrastructure and integration, but also room for further development.

Implementation indicator	Reported finding
Dedicated e-government strategy	87% positive; mean 4.2
Comprehensive digital services	Mean 3.0
Infrastructure updates	71.8% positive; mean 3.8
Integrated digital solutions	65.2% positive; mean 3.7

4.3 E-Government Adoption Rate

The adoption findings were generally favorable. Online service availability had a mean of 4.3, citizen platform usage a mean of 4.1, staff digital adoption a mean of 4.0, and adoption growth a mean of 4.1. The source research also reports 84.8% favorable responses concerning citizen platform usage and 80.4% favorable responses concerning staff adoption.

These results indicate that adoption is not limited to citizens. Internal employee adoption is equally important because municipal employees are responsible for processing, validating, maintaining, and responding to digital transactions. Weak staff adoption can cause a digital front end to coexist with manual back-office processes.

4.4 Service Delivery Enhancement

Service delivery was one of the strongest areas in the descriptive results. Eighty-two-point six percent of respondents reported positively that digital transformation reduced service-delivery time. The same proportion reported reductions in errors or improvements in accuracy and increases in citizen satisfaction. Eighty-six-point nine percent reported positively regarding reductions in administrative costs.

These findings provide direct evidence of perceived service-performance improvement within the studied municipal contexts. The results should nevertheless be interpreted as respondent perceptions rather than independently audited performance statistics. Their importance lies in the consistency across four dimensions: speed, accuracy, satisfaction, and cost.

Service-performance indicator	Reported positive response
Reduced service-delivery time	82.6%
Reduced errors / improved accuracy	82.6%
Increased citizen satisfaction	82.6%
Reduced administrative costs	86.9%

4.5 Implementation Barriers

Despite positive performance perceptions, implementation barriers remained substantial. Staff digital-skill deficiency was reported positively as a barrier by 80.4% of respondents, technical infrastructure by 82.7%, citizen digital literacy by 82.6%, and financial resources by 78.3%. Staff-skill deficiency had a mean of 4.09.

The pattern shows why digital transformation should not be evaluated only by current service outcomes. Municipalities may achieve improvements while still carrying structural vulnerabilities that could limit sustainability or expansion. In particular, skills and infrastructure require continuous investment because systems, security requirements, and service expectations change over time.

Barrier	Reported finding
Financial resources	78.3% identified as a barrier
Technical infrastructure	82.7% identified as a barrier
Staff digital skills	80.4% identified as a barrier; mean 4.09
Citizen digital literacy	82.6% identified as a barrier

4.6 Economic Modernization Alignment

The modernization-alignment results were also favorable. Direct support for the modernization vision received 89.2% positive responses and a mean of 4.24. Coordination with national plans received 80.4% positive responses, improvement of the business environment 80.5%, and alignment with national modernization priorities 82.6%.

These findings suggest that respondents viewed municipal digital transformation as connected to broader modernization objectives. The relationship is conceptually plausible because faster, more accurate, and more accessible public services can reduce administrative friction for citizens and businesses.

4.7 Reliability and Factor Results

The measurement results support the internal consistency of the constructs. Adoption rate showed the highest reliability ($\alpha=.911$), followed by implementation barriers ($\alpha=.878$) and service delivery enhancement ($\alpha=.841$). Implementation level ($\alpha=.723$) and modernization alignment ($\alpha=.712$) were also acceptable. Factor loadings were generally moderate to strong, providing additional support for the measurement structure.

4.8 Regression Results

An important methodological point is that the regression models in the source study use Economic Modernization Alignment as the dependent variable. The present paper reports these results exactly as they appear in the source empirical foundation and does not reinterpret them as direct causal models of municipal service performance.

Explanatory construct	R	R ²	Adjusted R ²	F	p
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E-Government Implementation Level	.526	.277	.186	13.063	.020
E-Government Adoption Rate	.486	.237	.162	23.176	.023
Service Delivery Enhancement	.590	.348	.247	33.466	<.001
Implementation Barriers	.560	.314	.247	41.683	<.001

4.8.1 Implementation Level and Modernization Alignment

The reported model for e-government implementation level produced $R=.526$ and $R^2=.277$, with $F=13.063$ and $p=.020$. Approximately 27.7% of the variation in economic modernization alignment was explained by the implementation-level measure in the reported model. The result supports a statistically significant relationship between stronger implementation and modernization alignment.

4.8.2 Adoption Rate and Modernization Alignment

The adoption model produced $R=.486$ and $R^2=.237$, with $F=23.176$ and $p=.023$. The result indicates a statistically significant relationship between adoption rate and economic modernization alignment. The finding reinforces the distinction between having digital services and achieving actual use.

4.8.3 Service Delivery Enhancement and Modernization Alignment

Service delivery enhancement produced the strongest reported relationship among the explanatory constructs, with $R=.590$, $R^2=.348$, adjusted $R^2=.247$, $F=33.466$, and $p<.001$. The result indicates that 34.8% of the variation in modernization alignment was explained by the service-delivery enhancement measure in the reported model. This is consistent with the central argument that the economic and institutional value of digital government becomes more visible when digital services improve practical service outcomes.

4.8.4 Implementation Barriers and Modernization Alignment

Implementation barriers produced $R=.560$, $R^2=.314$, adjusted $R^2=.247$, $F=41.683$, and $p<.001$. The original study interprets the relationship as inverse: higher levels of financial, technical, human-capacity, and digital-literacy barriers correspond to weaker modernization alignment. The result emphasizes that barrier reduction is not a secondary issue but a condition for sustaining digital transformation.

4.9 Detailed Interpretation of the Measurement Evidence

The factor-loading results provide useful evidence about the internal structure of the measures. For implementation level, the loadings were .790 for strategic e-government planning, .741 for comprehensive digital services, .783 for infrastructure updates, and .707 for integrated digital solutions. The pattern indicates that strategic, service, infrastructure, and integration dimensions all contributed meaningfully to the implementation construct.

For adoption rate, the loadings were .613 for online-service availability, .723 for citizen platform usage, .866 for staff digital adoption, and .629 for adoption growth. Staff adoption had the strongest loading, suggesting that internal organizational use was particularly prominent within the construct. This reinforces the argument that municipal digital transformation depends on the back office as much as on the citizen-facing interface.

For service delivery enhancement, the loadings were .801 for faster delivery, .806 for error reduction, .861 for citizen satisfaction, and .565 for lower administrative costs. Citizen satisfaction was the strongest indicator, while cost reduction was comparatively weaker. This does not mean cost reduction is unimportant; rather, it suggests that respondents may have perceived improvements in user experience more consistently than financial effects.

For implementation barriers, the loadings were .804 for financial resources, .746 for technical infrastructure, .774 for staff skill deficiency, and .622 for low digital literacy. The pattern shows that barriers were distributed across financial, technical, human, and citizen dimensions rather than concentrated in one category.

For modernization alignment, the loadings were .643 for vision support, .780 for economic-plan coordination, .806 for business-environment improvement, and .738 for transformation-policy alignment. These results support the multidimensional character of modernization alignment.

4.10 Descriptive Results in Comparative Perspective

The descriptive results reveal a notable contrast between strategic readiness and service breadth. The dedicated strategy indicator reached a mean of 4.2, whereas comprehensive digital services had a mean of 3.0. This suggests that strategic recognition of digital transformation may be ahead of the full digitization of municipal service portfolios.

Adoption indicators were stronger than the service-breadth indicator. Online service availability had a mean of 4.3, citizen platform usage 4.1, staff digital adoption 4.0, and adoption growth 4.1. The pattern suggests that where services are available, respondents perceive meaningful use by both citizens and employees.

Service-performance indicators were also strongly positive. More than four-fifths of respondents reported improvements in speed, accuracy, and satisfaction, while 86.9% reported reduced administrative costs. This convergence across multiple indicators strengthens the interpretation that respondents perceived digital transformation as operationally beneficial.

However, the simultaneous reporting of strong outcomes and strong barriers is not contradictory. Digital transformation can improve current performance while still facing constraints that threaten future scaling. A municipality may successfully operate selected services but struggle to extend the model to all departments or maintain the infrastructure required for continued growth.

Chapter Five: Discussion

5.1 Interpretation of the Main Findings

The overall findings support a coherent interpretation of municipal digital transformation in Jordan. First, implementation appears to have progressed to a meaningful level, particularly in strategic planning and online service availability. Second, respondents perceive actual adoption by citizens and staff. Third, service-delivery indicators show positive perceived improvements in speed, accuracy, satisfaction, and cost. Fourth, substantial barriers remain, particularly infrastructure, skills, digital literacy, and finance. Finally, the regression results show that these dimensions are significantly related to economic modernization alignment.

The strongest reported relationship was associated with service delivery enhancement. This is theoretically important because it places outcomes above technology deployment. Municipal digital transformation creates value when users experience a better service and when administrative organizations experience measurable operational benefits.

The adoption result also has practical significance. A digital platform can be available without being meaningfully used. The favorable adoption findings suggest that the studied municipalities have achieved a degree of user and employee engagement, but the continued presence of digital-literacy barriers indicates that adoption cannot be treated as permanently solved.

The barrier findings demonstrate that transformation is path-dependent. Existing infrastructure, staff skills, financial resources, and organizational practices shape what municipalities can achieve next. The challenge is therefore to move from isolated digital projects toward a sustainable operating model.

5.2 Relationship to Previous Research

The results are consistent with Ataya (2023), who identified weak financial capacity, insufficient training, and inadequate technical requirements as major barriers in Jordanian municipalities. The present empirical findings similarly identify finance, infrastructure, and staff skills as important barriers.

The findings also align with Alkayed (2023), who emphasized information systems, electronic services, technical equipment, staff qualification, and supportive regulations as requirements for municipal digital transformation. The implementation construct in the source study incorporates strategy, digital services, infrastructure updates, and integrated solutions, closely reflecting these requirements.

The moderate perception of electronic services reported in the Kufranja case study is also relevant. It illustrates that the existence of municipal electronic services does not necessarily mean that users experience them as fully developed. The present paper's distinction between implementation and performance helps explain why digital service availability should be evaluated alongside actual user experience.

Citizen-adoption findings are compatible with Jordanian research emphasizing trust, awareness, self-efficacy, perceived usefulness, and resistance to change. These factors help explain why citizen

engagement should be treated as a mechanism of digital transformation rather than merely a demographic characteristic.

The literature on digital government and sustainable development also supports the broader modernization interpretation. Dhaoui (2022) links e-government with sustainable development in MENA countries, while the source thesis connects municipal service improvements with Jordan's economic modernization objectives.

5.3 Theoretical Implications

The findings support a multi-theoretical understanding of digital government. NPM explains the emphasis on efficiency and service quality; TAM explains the importance of usefulness and ease of use; and Diffusion of Innovations explains differences in the pace and depth of adoption.

The results also suggest that no single theory is sufficient to explain municipal digital transformation. Technology acceptance can explain whether users are willing to use a system, but it does not explain whether the municipality has sufficient financial resources or interoperability. NPM explains performance objectives but does not fully explain citizen trust. Diffusion theory explains adoption across social and organizational systems but does not by itself establish service-quality outcomes.

An integrated framework is therefore more appropriate for municipal digital transformation. Technology, people, organizational capacity, and public value should be considered simultaneously.

5.4 Practical and Policy Implications

First, municipalities should prioritize service redesign rather than simple digitization. High-volume services should be mapped from the citizen's perspective, unnecessary steps removed, information requirements simplified, and transaction status made visible.

Second, municipalities should invest continuously in employee capability. Training should cover not only software operation but also data management, cybersecurity, digital customer service, process redesign, and change management.

Third, citizen digital literacy should be addressed as part of service delivery. Municipalities can publish clear guidance, provide assisted digital support, use simple language, and maintain alternative access for citizens who cannot complete transactions independently online.

Fourth, interoperability should be treated as a strategic priority. Integrated systems can reduce duplicate data entry and repeated document requests. Shared standards and secure data exchange can also reduce fragmentation between municipal departments and external public institutions.

Fifth, digital investments should be linked to measurable service-performance indicators. Municipalities should monitor processing time, completion rate, error rate, user satisfaction, cost per transaction, and digital-channel adoption. This would make it possible to distinguish between technology activity and actual service improvement.

Sixth, financial planning should account for the full life cycle of digital systems, including maintenance, cybersecurity, training, upgrades, and user support. Short-term procurement without long-term sustainability can create systems that become obsolete or difficult to maintain.

Seventh, governance and leadership should support transformation. Clear accountability, strategic planning, cross-departmental coordination, and employee participation can reduce organizational resistance and improve implementation.

5.5 A Municipal Digital Transformation Roadmap

Stage	Priority actions	Expected management focus
1. Diagnose	Map services, infrastructure, skills, user needs	Baseline and priorities
2. Simplify	Redesign high-volume processes before digitization	Remove unnecessary steps
3. Digitize	Introduce secure digital channels and electronic transactions	Access and convenience
4. Integrate	Connect systems and data where legally and technically appropriate	Interoperability
5. Engage	Support citizens, gather feedback, improve usability	Adoption and trust
6. Measure	Track time, accuracy, satisfaction, cost, adoption	Performance management
7. Scale	Expand successful services and introduce advanced analytics/AI selectively	Sustainability and innovation

5.6 Limitations of the Discussion

The discussion must be read within the limits of the underlying evidence. The survey is cross-sectional and relatively small. The service-performance indicators are perception-based. The regression models explain economic modernization alignment rather than directly estimating causal effects on service performance. The paper therefore provides a strong interpretive framework and evidence of significant associations, but not a definitive causal estimate of the effect of digital transformation on municipal performance.

5.7 Implications for Municipal Governance

The findings imply that municipal governance should move from project-based digitalization toward portfolio-based digital governance. A project-based approach may produce isolated applications, while a portfolio approach coordinates service priorities, infrastructure, data, cybersecurity, human resources, finance, and performance measurement.

Governance should also clarify ownership. Each major digital service should have an accountable business owner responsible for the service outcome, not only an IT owner responsible for the software. This encourages municipal departments to view digital services as part of their core service responsibilities.

Performance governance should combine operational indicators with user indicators. Processing time and error rates show internal performance, while satisfaction and adoption show external experience.

Monitoring both prevents a municipality from declaring success based solely on system uptime or number of transactions.

Finally, municipal leaders should treat digital transformation as a continuous capability. Technology, citizen expectations, cybersecurity risks, and regulatory requirements change over time. Continuous improvement is therefore more appropriate than a one-time implementation mindset.

5.8 Implications for Economic Modernization

The relationship between municipal digital transformation and economic modernization can be understood through administrative transaction costs. Citizens and businesses interact with local government through permits, information requests, payments, inspections, planning processes, and other administrative procedures. If these interactions become faster, clearer, and more predictable, the local administrative environment may become more supportive of economic activity.

The source regression findings provide empirical support for this broader interpretation. Service delivery enhancement had the strongest reported relationship with modernization alignment, while implementation and adoption also showed significant relationships. Conversely, barriers were inversely associated with modernization alignment. These results indicate that modernization is linked to practical implementation conditions rather than to policy statements alone.

Nevertheless, the study does not directly measure business productivity, investment, employment, municipal revenue growth, or other macroeconomic outcomes. The appropriate conclusion is therefore that municipal digital transformation is aligned with modernization objectives, not that it has been proven to cause a specific economic growth effect.

Chapter Six: Conclusion and Recommendations

6.1 Conclusion

Digital transformation in Jordanian municipalities is best understood as an organizational transformation of service delivery rather than as the simple introduction of electronic tools. The evidence reviewed in this paper shows meaningful progress in implementation and adoption, together with positive perceptions of service improvement. Respondents reported faster service, fewer errors, greater citizen satisfaction, and lower administrative costs. These outcomes are important because they connect digital transformation to practical public value.

At the same time, the evidence demonstrates that progress remains conditional. Financial resources, technical infrastructure, staff digital skills, and citizen digital literacy continue to constrain transformation. These barriers can prevent municipalities from scaling successful services, integrating systems, or maintaining consistent quality.

The reported regression models provide additional evidence of the strategic importance of these dimensions. Implementation level, adoption rate, service-delivery enhancement, and implementation barriers were all significantly related to economic modernization alignment in the source research.

Service-delivery enhancement produced the strongest reported relationship, reinforcing the argument that modernization is most meaningful when digital investment translates into better services.

The central conclusion is therefore that municipal digital transformation requires alignment between technology, organizational capacity, and citizen engagement. Municipalities should not measure success by the number of platforms or applications introduced. They should measure whether residents can complete services more easily, whether employees can process transactions more effectively, whether information is accurate and integrated, and whether public resources are used more efficiently.

6.2 Recommendations

- Develop municipality-specific digital transformation plans linked to measurable service-performance indicators.
- Prioritize high-volume and high-impact municipal services for process redesign and digitalization.
- Strengthen employee digital skills through continuous training and practical change-management programs.
- Invest in interoperable systems and secure data exchange to reduce duplication and repeated information requests.
- Develop citizen digital-literacy and awareness initiatives, especially for groups at risk of digital exclusion.
- Maintain accessible assisted-digital and alternative service channels so that digitalization does not exclude vulnerable users.
- Establish service-performance dashboards covering processing time, errors, satisfaction, cost, completion, and digital adoption.
- Include cybersecurity, privacy, backup, and data-governance requirements in every digital transformation project.
- Adopt life-cycle budgeting that includes maintenance, upgrades, training, support, and cybersecurity rather than focusing only on initial procurement.
- Strengthen partnerships and knowledge sharing among municipalities, national institutions, universities, and qualified technology providers.
- Use artificial intelligence and advanced analytics selectively after foundational infrastructure, data quality, and governance requirements are established.
- Conduct periodic citizen and employee feedback studies to ensure that digital services continue to reflect actual needs.

6.3 Future Research

Future studies should use larger samples that include both municipal employees and citizens. This would permit comparison between internal organizational perceptions and external user experience.

Longitudinal research would be especially valuable because digital transformation is a process. Repeated measurement could determine whether improvements in service performance persist over time and whether organizational capacity changes as implementation matures.

Future research should compare urban and rural municipalities to identify differences in infrastructure, digital literacy, adoption, and financial capacity. Such research could help develop differentiated transformation policies rather than a single national implementation model.

Research should also examine the effects of organizational culture, leadership, change management, and employee participation. These factors may explain why municipalities with similar technologies achieve different results.

Finally, future research can investigate advanced digital technologies such as AI-enabled municipal assistants, predictive analytics, and automated workflow systems. Such work should focus on measurable public value, governance, fairness, privacy, and service quality rather than technology adoption alone.

6.4 Final Statement

Jordan's municipal digital transformation agenda has the potential to strengthen public-service quality and support broader modernization, but the evidence indicates that technology alone is insufficient. Sustainable transformation depends on the simultaneous development of infrastructure, organizational capability, citizen engagement, process integration, financial sustainability, and performance measurement. The strongest path forward is therefore an outcome-oriented digital government model in which every major digital investment is evaluated by the quality, accessibility, efficiency, and trustworthiness of the service it produces.

6.5 Implementation Priorities for the Next Three Years

In the first phase, municipalities should establish a reliable baseline. Each municipality can inventory its digital services, infrastructure, systems, staff capabilities, data flows, user volumes, and service-performance indicators. This creates a practical basis for prioritization.

In the second phase, municipalities should redesign high-volume services. Process mapping can identify unnecessary approvals, duplicate data requirements, manual handoffs, and avoidable physical visits. Digitalization should follow process simplification rather than reproduce inefficient procedures.

In the third phase, municipalities should expand interoperability and performance management. Where legally appropriate, systems should exchange data through secure standards. Dashboards should track service completion, processing time, errors, satisfaction, adoption, and cost.

Throughout all phases, citizen support and staff training should continue. Digital transformation should also include cybersecurity and privacy by design. Once foundational maturity is achieved, municipalities can selectively introduce AI, predictive analytics, and automation for services where these technologies offer clear value.

This staged approach is consistent with the evidence of the present study. It recognizes the positive service-performance findings while directly addressing the financial, infrastructure, skills, and digital-literacy barriers reported by respondents.

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