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THE ROLE OF DIGITAL GOVERNANCE IN ENHANCING LOCAL ADMINISTRATION EFFICIENCY: AN ANALYTICAL STUDY AT THE SALAH AL-DIN GOVERNORATE COUNCIL

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Abstract. This analysis, entitled "Digital Governance and its Role in Increasing the Efficiency of Local Administration," was presented at the Salah al-Din Governorate Council. The paper measures the extent of digital governance using four variables, namely, digital infrastructure, digital leadership, cybersecurity and digital transparency, and explores the nature of their correlative and causal relations with efficiency of local governance. The research was descriptive and analytical and information was collected mainly through questionnaire. Of the 156 questionnaires administered to the sample of the study, all were returned, a response rate of 100%. The researchers utilized various types of statistical techniques like Arithmetic Mean, Standard Deviation, Coefficient of Variation, Index of Relative Importance, Correlation Coefficient, and Simple Linear Regression Analysis.

The findings revealed that the level of digital governance in the council is moderate tends to high with the overall mean at 3.366 and relative importance at 67.325%. Efficiency in local administration was also at the average high level with mean at 3.305 and relative important at 66.090%. The findings suggest a very strong, positive and statistically significant correlation between digital administration and the local government efficiency ($r=0.828$, $p<0.001$). Similar to that, digital governance also had a positive and significant statistical effect on the efficiency of the local administration. It had a standardized coefficient of $\beta = 0.828$. Moreover, this variable accounts for 68.5% of the local administration efficiency. Digital leadership is the most important dimension in terms of correlation and effect, followed by cybersecurity, digital transparency and digital infrastructure. The findings of the study recommend the adoption of integrated digital governance roadmap, strengthening of digital leadership, advancement of cybersecurity and digital transparency and the development of electronic services which enable citizens to trace their transactions which enhance responsiveness, improve service quality and facilitate optimum utilization of organizational resources.

Keywords: Digital Governance, Digital Infrastructure, Digital Leadership, Cybersecurity, Digital Transparency, Enhancing Local Administration Efficiency, Salah al-din Governorate Council.

Introduction

The accelerated digital transformation has put digital governance as one of the key pillars of the reform of the public administration. Digital governance is an important tool of institutional development as it provides modern mechanisms for enhancing transparency, accountability, effective use of resources and better quality of public service. The use of digital technologies

in the government bodies is an effective tool for reforming the administrative processes, supporting the decision-making, simplifying the procedures, increasing the efficiency of the institutions and their responsiveness to the citizens.

Local government is especially significant because it is the level of government closest to communities and is responsible for the planning and implementation of local policies and for the oversight of the delivery of services. The need for administrative reform is increasing in Iraq, and the need to adopt practices for digital governance is becoming increasingly important to improve the effectiveness of local administrations in addressing the challenges of company, administrative and technical issues, in light of the objectives of digital transformation and sustainable development goals.

One of the local institutions that will benefit greatly from digital governance is the Council of the Salah al-Din Governorate, which would improve their administrative performance, improve coordination between departments, speed up the completion of tasks and increase the transparency of procedures. However, the effectiveness of these practices is conditional on the existence of an adequate digital infrastructure, a supportive organizational environment and human competencies to effectively implement contemporary technologies.

Accordingly, this study aims to investigate the role of digital governance in improving the efficiency of the local administration in Salah al-Din Governorate Council. It studies the level of application of digital governance practices and its effect on improving the efficiency of administrative performance. The study results contribute to the improvement of the literature of digital governance and local administration and provide indicators that can be used to inform and support the efforts of digital transformation and the development of institutions of local administration in Iraq

Section One: Methodological Framework

First: Research Problem

As the number of transactions increases, as citizens' needs become more diverse and as data and digital platforms become more important, the local administration is more and more expected to provide services that are faster, more transparent and more responsive. This transformation is more than buying hardware and software, it requires a comprehensive digital governance framework that connects infrastructure to leadership orientation, to cybersecurity and to digital transparency and ensures that these elements are utilized to improve the performance of administration and services.

The applied problem of the current study is the lack of clarity on the level of digital governance practices in the Council of Salah al-Din Governorate and the extent of their contribution to improving the efficiency of local administration. While some digital technologies or services may be available, their impact may be limited unless they are accompanied by effective digital leadership, regular data protection, clear information disclosure and meaningful capacity for citizens to track their transactions and see their needs addressed.

Thus, the problem of the research can be formulated in the following question: How does digital governance, through its four dimensions: Digital Infrastructure, Digital Leadership, Cybersecurity and Digital Transparency, improve the efficiency of local administration at the Salah al-Din Governorate Council?

This primary question leads to the following sub-questions:

1. What is the availability of digital governance and its dimensions in the Salah al-Din Governorate Council?
2. Level of efficiency of local administration in the studied Council?
3. Is there statistically significant relationship between digital governance and its dimensions and local administration efficiency?
4. Is there a statistically significant effect of digital governance on the efficiency of local administration by its dimensions?
5. Which dimensions of digital governance are the most correlated and have the biggest impact on the efficiency of local administration?

Second: Significance of the Study

- The study provides a scientific framework on the integration of the technical, leadership, security and informational dimensions of digital governance rather than considering digital transformation as a matter of technology acquisition.
- It refers to a matter that is directly related to the improvement of local administrations, the level of government closest to citizens and their daily needs.
- Field diagnosis of the status of digital governance and the efficiency of local administration in the Council of the Governorate of Salah al-Din to identify gaps in the actual implementation.
- And thus, shows the strength of the relationship and the impact of each of the dimensions of digital governance in directing management to areas with the highest return in the allocation of resources and efforts.
- It provides decision-makers with quantitative indicators for digital plans elaboration, performance monitoring and service quality and responsiveness improvement to citizens.
- It opens the way for future research to test the model on other governorate councils and administrative units, or to suggest intervening and moderating variables that could further explain the efficiency of local administration.

Third: Research Objectives

1. Level of Availability of Digital Governance and its Dimensions in the Salah al-Din Governorate Council.
2. Diagnosis of the level of efficiency of the local administration from the point of view of the study sample.
3. To examine the relationship between digital governance and its dimensions and the efficiency of local administration.
4. To study the impact of digital governance and its dimensions on the efficiency of local administration.
5. To rank the dimensions of digital governance according to the correlation and strength of the effect and to find out the strengths and weaknesses of implementation.
6. To make recommendations and define implementation mechanisms for the Council in an effort to achieve greater efficiency in the administrative and service sectors.

Fourth: Research Hypotheses

- The study is based on one main hypothesis and several sub-hypothesis:
- The first main hypothesis: There is a statistically significant correlation between digital governance and the efficiency of local administration in the Council of Salah al-Din Governorate.
- Sub-hypothesis: The efficiency of local administration is statistically significantly positively related to digital infrastructure.
- Sub-hypothesis: There is a statistically significant positive relationship between digital leadership and efficiency of local administration.
- Sub-hypothesis: There exists a statistically significant positive correlation between cybersecurity and local administration efficiency.
- Sub-Hypothesis: There is a positive relationship between digital transparency and efficiency of administration at significant levels.

- The second main hypothesis: Digital governance has a statistically significant positive effect on the efficiency of the local administration in Salah al-Din Governorate Council.
- Sub-hypothesis: The efficiency of local administration is statistically significantly and positively influenced by the digital infrastructure.
- Sub-hypothesis: Digital leadership has a statistically positive impact on local administration efficiency.
- Sub hypothesis: Cybersecurity has positive and significant effect on efficiency of local administration.
- Sub-hypothesis: Digital transparency has a statistically significant positive effect on the efficiency of local administrations.

Fifth: Conceptual Model of Variables

The study examined the relationship between two major variables:

Independent Variable: Digital Governance, with the following dimensions:

• The digital infrastructure

• Digital Leadership

• Cyber Security

• Digital Visibility

Dependent variable Effectiveness of local government

The conceptual model and hypothesized relationships among the study variables are shown in Figure (1).

Sixth: Research Boundaries

Thematic Boundaries The paper explores the role of the digital governance in the four dimensions of digital infrastructure, digital leadership, cybersecurity and digital transparency in improving the efficiency of the local administration.

Spatial Boundaries The application scope shall be limited to the Salah al-Din Governorate Council.

Temporal Boundaries The study was conducted in 2026 and utilized data collected during the study's implementation period.

Human Boundaries The study population consisted of members of the Salah al-Din Governorate Council, heads of committees, administrative departments and employees working at the Council and have a role in digital governance applications and administrative work.

Seventh: Research Population and Sample

The whole Salah al-Din Governorate Council employees at all administrative levels, functional specializations and organizational units form the research population. This group was selected as it is best positioned to assess the level of digital governance implementation and diagnose its repercussions on local administration efficiency. Members of this group are directly in touch with the devices, systems and platforms. Moreover, they execute procedures, deliver services and complete transactions.

A total of 156 survey respondents were officers of the Council. All 156 questionnaires which were distributed to the sample, and returned giving a response rate of 100 per cent. The total response rate indicates the sample members' level of interest in the research subject and their willingness to provide data. As a result, the researcher may use all the returned questionnaires to describe the research variable and test the correlation and causality between digital governance and local administration efficiency.

Eighth: Previous Studies

First: Arabic Studies

1. Al-Azzawi and Al-Jubouri (2023)

The purpose of this research was to study the role of digital governance in the improvement of institutional performance, in sample of Iraqi government institutions. The study used a descriptive-analytical approach that involved a questionnaire distributed to 210 employees of various governmental offices. In a recent study, researchers found that favourable digital governance can effectively improve the efficiency of institutional performance by enhancing the digital infrastructure and procedural transparency.

2. Hassan (2022)

This research focuses on digital governance wherein many firms are using the computer-related technologies or software to make the function of their firm easy. The digital governance implementation challenges with the digital governance implementation are weak digital infrastructure, lack of technical competencies and deficiencies in the digital legislation, based on the descriptive-analytical findings.

Second: Foreign Studies

3. Bianchi et al. (2024)

This research used Structural Equation Modeling (SEM) to analyze the impact of digital governance on the efficiency of local administration in a number of European municipalities. The results show that digital leadership and digital transparency have a direct positive effect

on administrative performance efficiency, while digital infrastructure is a key element to support the success of digital transformation.

4. AlNuaimi et al. (2023)

The study aimed to explore the relationship between cybersecurity and digital governance in the public sector through a questionnaire distributed to government institutions in the United Arab Emirates. Researches proved that the introduction of cybersecurity practices increases users' trust in digital systems, improves the quality of government services and the efficiency of administrative processes.

Commentary on Previous Studies

The above literature review shows that digital governance is one of the most important modern administrative approaches to improve the efficiency of government institutions. The vast majority of studies confirm a positive effect of its various dimensions, especially digital infrastructure, digital leadership, cybersecurity and digital transparency, on the development of administrative performance. But there is a large gap in practical studies dealing with this relationship within the framework of the Iraqi governorate councils, especially when considering the Salah al-Din Governorate Council. This is the research gap that the current study seeks to fill through an applied analysis consistent with the realities of local administration in Iraq.

Section Two: Theoretical Framework

This section presents the concept of digital governance, its importance, objectives, and dimensions (digital infrastructure, digital leadership, cybersecurity, and digital transparency) and the role of these dimensions in improving institutional performance and increasing the efficiency of local administration. It also discusses the concept of efficiency of local administration, its importance and objectives and ends with clarifying the theoretical basis that explains the relationship between digital governance and efficiency of local administration. The framework is the scientific basis on which the study is founded in analyzing its findings and testing its hypotheses.

First: The Concept of Digital Governance

E-governance is the use of information and communication technologies, namely the internet, mobile applications and digital platforms to make government services more efficient and effective, promote transparency and accountability, and encourage citizen participation in governance. It allows more effective and easier interaction between government and citizens, businesses, employees and other government entities (Shadi, 2021, p. 65).

E-governance using electronic devices facilitates the process of simplifying procedures in public administration, promotes data-driven decision making and helps in fighting corruption by making government processes more transparent and open. Jassim et al. (2025) state that e-governance is an administrative system that uses information and communication technology to manage the government operations. The aim is to make public service provision more effective, to increase transparency and to boost efficiency. E-governance has many dimensions such as digital automation of government transactions, provision of electronic platforms for

government-citizen communication and application of electronic oversight systems for integrity and transparency.

Governance, according to UNESCO, is the exercise of political, economic and administrative authority to manage a nation's affairs. It is the manifestation of the interests, rights and obligations of citizens. Therefore, e-governance can be defined as the conduct of this governance by electronic media with a view to provide for the effective, quick and transparent dissemination of information amongst the public and other bodies and conducting governmental administrative activities. The Council of Europe defines e-governance as the use of electronic technologies in three areas of public activity: relations between public authorities and civil society; the functioning of public authorities at all stages of the democratic process (electronic democracy); and the delivery of public services (electronic public services).

Digital governance is a high-level framework that describes the management and governance of digital transformation initiatives in organizations (The RMG Team, 2025). This governance includes all processes that enable monitoring the implementation of the plan, measuring performance and achieving strategic objectives. The goal is to coordinate the different departments and assign responsibilities for effective and lasting results.

Second: The Significance of Digital Governance

Governments are looking at digital governance to enhance public performance, making it more effective and efficient. It promotes transparency and efficiency in the state administration, as well as encourages a process of transformation that increases the participation of citizens in the knowledge economy, encourages policy dialog and the implementation of modern practices, encourages decision-making, and facilitates the formulation of policies that are consistent with the needs of citizens and residents (Abd al-Qadir, 2016, p. 87). According to Sahl Legal Consultancy (2025) the importance of digital governance is as follows:

• Improving the organization's competitiveness, achieving academic rigor, preventing administrative and financial corruption, building confidence among relevant parties, and developing the capacity for development (Alaa, 2021, p. 53).

• Provide some kind of self-regulation and supervision that contributes to the correct application of the dominant laws and regulations and therefore improve governance and guaranty the rights of individuals and thus contribute to society's satisfaction with the performance of the institution (Alaa, 2021, p. 55).

• Enhance the quality of government services.

Compliance with local and international laws and regulations.

• Enhanced cyber security and data protection.

• Build sustainable and strong relationships between civil society organizations and government authorities.

• Deliver government services to citizens and businesses that meet their needs and expectations.

• Making government data, information and services easily and openly accessible to citizens, and improving operational efficiency and reducing waste.

• Efforts to standardize and coordinate working mechanisms of various government departments and organizations to improve efficiency.

• The implementation of the principles of transparency and accountability in all administrative processes and procedures of the Government.

• Digital transformation for lower operating costs and expanded government sources of income

• Abolition of bureaucracy, corruption in administration and transparency in the management of digital resources.

• Improving the methods of government administration and its performance to meet the requirements of the digital era.

• Streamlining government bodies by removing unnecessary layers of administration and making them more agile.

• Restructured critical administrative processes and procedures to enhance efficiency and effectiveness.

Third: Objectives of Digital Governance

Digital governance is the use of digital technologies for the management of administrative processes and decisions. The objective is to enhance the performance of public and private institutions and to increase efficiency, transparency and responsiveness to stakeholders. Digital governance is not merely the digitization of services but a total administrative system that links technology with good governance to optimally use resources and enhance the quality of institutional performance (Ali, 2017, p. 65). The key objectives of digital governance are:

• **Enhancing Transparency:** Through the dissemination of government information and data to citizens and stakeholders, thereby increasing trust in public institutions and reducing corrupt practices.

• **Enhancing Transparency:** By providing government information and data to citizens and stakeholders, thus increasing trust in public institutions and reducing corrupt practices.

• **Improving Institutional Performance Efficiency:** which results in the automation of administrative procedures, reduction in time, effort and costs, an increase in productivity of the workforce – outcomes that are reflected positively in the quality of government services.

• **Supporting Decision-Making:** by providing integrated databases and accurate information systems to aid administrative leaders in making evidence- and data-based decisions, rather than relying on personal estimates.



- **Strengthening Accountability and Oversight:** Utilizing digital systems to track performance, document administrative processes, enable evaluation of performance, and hold responsible parties accountable, based on objective criteria.
- **Raising the Quality of Public Services:** Simplified procedures, provision of services in electronic form and reduced paper-based transactions – contributing to improved beneficiary experience and increased satisfaction with services rendered.
- **Reinforcing Cybersecurity and Data Protection:** Through the creation of policies and procedures to preserve the information security and integrity of digital systems, protect the confidentiality of data and guaranty the continuity of electronic service delivery.

Fourth: Dimensions of Digital Governance

Digital governance is an administrative system for using digital technology to enhance institutional performance and quality of public services. Furthermore, the success of dital governance depends on set of interelated dimensions which are capable of application in Government Institutions. Given the aims of the current study, the dimensions of digital governance are as follows:

1. Digital Infrastructure

Digital infrastructure is the base layer on which digital governance is built. It includes all the technical means necessary to operate digital systems, such as communication networks, data centers, hardware and equipment, software, and electronic service platforms. Presence of advanced digital infrastructure allows exchanging information, accelerates the completion of administrative operations, improves the quality of services and supports the integration of various organizational units. Digital infrastructure is also a necessary prerequisite for the success of digital transformation programs and the achievement of institutional performance efficiency (Latif, 2019, p. 92).

2. Digital Leadership

Digital leadership is the ability of the administrative leadership to lead the institution in the adoption of digital technologies and management of organizational change in accordance with the needs of digital transformation . It includes the creation of a digital vision, strategy development, motivating personnel to accept innovation, and providing resources needed for digital system development. Digital leadership is an important determinant of the success of digital governance as it contributes to the creation of an organizational culture conducive to innovation and enhances the institution's capacity to adapt to technological and administrative change (Mohammed, 2018, p. 42).

3. Cybersecurity

The most important aspect of digital governance is cyber security. It is designed to protect digital systems, data and information from threats and cyberattacks, and to ensure the confidentiality, integrity and availability of information. Effective security policies, modern protection technologies, digital risk management, and increased security awareness among personnel are instrumental in this regard. Cybersecurity helps to enhance trust in digital systems and to sustain the delivery of government service efficiently and reliably (Mohammed, 2019, p. 44).

4. Digital Transparency

Digital transparency is the use of digital means to make available to citizens the information and data of government, accurately and on time, thus contributing to the clarity of administrative procedures and raising the level of accountability and trust between government institutions and citizens. It includes the publication of data, the offering of electronic services, the disclosure of decisions and procedures, and the empowerment of stakeholders to access information with ease. According to Alaa (2021, p. 78), strengthening digital transparency can reduce administrative corruption, provide better quality of service, and enhance community participation in decision making.

Fifth: The Concept of Local Administration Efficiency

Efficiency in local administration is a basic concept of public administration. It is the capacity of the local administrative units to use their human, financial and technical resources efficiently so that they can achieve their development objectives and to provide public services of quality. Efficiency involves rational use of resources with minimum time, effort and costs. Efficiency also refers to the ability of local administration to plan, organize, coordinate, supervise and make decisions that result in an effective response to the needs of the local community (Ahwas, 2023, p. 55).

According to Al-Ubaidi (2018), the efficiency of local administration is in the ability of local institutions to fulfilll their responsibilities and mandates in a manner that achieves the optimal use of the available resources, develop the administrative working mechanisms and improve the quality of services provided to citizens, in accordance with the requirements of sustainable local development.

Al-Shaykhali (2015) emphasizes that the efficiency of the local administration is not limited to the speed of completion of the tasks, but rather is reflected in the balance between the efficiency of the use of resources and the effectiveness of institutional performance, through the use of modern administrative methods, and the strengthening of coordination between organizational units, and the improvement of the quality of administrative decisions.

Bubrima and Ammara (2019) also explained that the improvement of the efficiency of local administration has become strongly associated with the application of good governance principles and digital transformation, considering their role in improving institutional performance, increasing transparency, bettering decision-making mechanisms and improving the quality of public services.

Sixth: The Significance of Local Administration Efficiency

One of the basic prerequisites for the success of local governments in the performance of their functions is the efficiency of local administration. It contributes to raising the level of the quality of public services, the use of available resources better, and improving the capacity of local institutions to achieve their developmental objectives with efficiency and effectiveness (Al-Buhairi, 2021, p. 41).

The importance of efficiency in the local administration is manifested in that it enables the administrative units to respond to the needs of the citizens through the simplification of administrative procedures, the acceleration of the processing of transactions, and the achievement of equity in service delivery - results that contribute to increasing the satisfaction of beneficiaries and strengthening the confidence of citizens in government institutions (Al-Harari, 2002, p. 94).

The efficiency of local administration is also of great importance in supporting the process of local development. It helps to optimize the use of financial and human resources, improve planning, organization and supervision, and has positive effects on the implementation of development projects and on the achievement of administrative and economic stability (Dahan, 2020, p. 180).

From another aspect, the efficiency of local administration is one of the factors that contribute to the improvement of the quality of administrative decisions in the way that it provides an organizational environment characterized by the flexibility and the coordination between administrative units, thus, it improves the capacity of local institutions to deal with the environmental variables and the administrative challenges in a more efficient way.**Seventh: Objectives of Local Administration Efficiency**

The efficiency of local administration seeks to achieve a set of objectives that contribute to developing the performance of local institutions and strengthening their role in community service, the most prominent of which are:

- **Achieving Optimal Resource Utilization:** Human, financial, and technical — ensuring higher levels of productivity and reduced waste (Al-Sayrafi, 2017).
- **Improving the Quality of Public Services:** Through developing administrative procedures and accelerating transaction processing in a manner that meets citizens' needs (Al-Salmi, 2018).
- **Raising Institutional Performance Efficiency:** By strengthening planning, organization, and oversight, and developing administrative working mechanisms (Abd al-Wahhab, 2019).
- **Supporting the Decision-Making Process:** By providing accurate information and developing working systems in a manner that contributes to achieving organizational objectives efficiently (Al-Maghribi, 2020).
- **Promoting Sustainable Local Development:** Through improving the performance of local institutions, and enhancing their ability to implement plans and development projects efficiently and effectively (Arab Planning Institute, 2021).

Section Three: Empirical Findings

The section includes presenting the description and diagnosis of the research variables, testing the suitability of the data for statistical analysis, and then testing the hypotheses of the correlational and causal relationships between digital governance and local administration efficiency at the Salah al-Din Governorate Council. Arithmetic mean, standard deviation, coefficient of variation, index of relative importance, skewness, kurtosis, Cronbach's alpha coefficient, Pearson's correlation coefficient and simple linear regression analysis were used.

First: Normality Test

The normality test is conducted to examine whether the research data are close to the normal distribution, which is one of the primary conditions for the application of parametric statistical tests. The skewness and the kurtosis values indicating the symmetry of the data distribution and the shape of concentration are used to test this. When the values of skewness and kurtosis are within the acceptable limits of statistics, the data are said to be normally distributed and Pearson's correlation coefficient and regression analysis are applicable.

Table 1. Normality Test Results for Research Variables and Dimensions

Variables and Dimensions	Skewness	Kurtosis
Digital Governance	-0.710	0.365
Local Administration Efficiency	-0.652	0.129
Digital Infrastructure	-0.455	-0.074
Digital Leadership	-0.817	0.128
Cybersecurity	-0.701	0.331
Digital Transparency	-0.532	-0.195

Source: Compiled by the researcher using SPSS v.27

The normality tests results showed that the values of skewness for all variables and dimensions were between −0.817 and −0.455, and the values of kurtosis were between −0.195 and 0.365. All values are within the statistically accepted range of ±1, so the data are approximately normally distributed and appropriate for parametric tests like Pearson's correlation coefficient and linear regression analysis. The negative skewness values indicate a slight tendency of responses toward higher scores, but not to the extent that the normality assumption is violated.

Second: Validity and Reliability Testing

The validity and reliability testing is a vital procedure to check the quality of the research instrument and the validity of its results. Validity is the capacity of the questionnaire to measure the variables it was designed to measure, and reliability is the consistency and stability of the responses of the sample members, usually measured using Cronbach's alpha coefficient. The closer the values of validity and reliability are to unity, the more reliable and appropriate for statistical analysis is the instrument.

Table 2. Validity and Reliability Coefficients for Research Variables and Dimensions

Variables and Dimensions	Cronbach's Alpha	Validity Coefficient
Digital Governance	0.934	0.966
Local Administration Efficiency	0.951	0.975
Digital Infrastructure	0.955	0.977
Digital Leadership	0.945	0.972
Cybersecurity	0.943	0.971
Digital Transparency	0.952	0.976

Source: Compiled by the researcher using SPSS v.27

The results show that the research instrument has a very high degree of reliability and internal consistency. The Cronbach's alpha for digital governance was 0.934 and for local administration efficiency was 0.951. The reliability coefficients of the digital governance dimensions ranged from 0.943 to 0.955. All of these were above the accepted threshold of 0.70. This means that the items within each variable measure one homogeneous construct and the results are reliable for further analysis. Validity coefficients (square root of reliability coefficient) varied from 0.966 to 0.977, confirming the instrument's capacity to measure the designated variables. The digital infrastructure obtained the highest values of reliability and validity (0.955 and 0.977 respectively). The lowest values, referring to the overall digital governance (0.934 for reliability and 0.966 for validity) are also high. In general, the questionnaire shows good statistical validity and reliability indicators.

Third: Description and Diagnosis of Research Variables and Dimensions

1. Digital Governance Variable and Its Dimensions

The following table shows the descriptive statistics of the digital governance variable and its dimensions, including arithmetic means, standard deviations, coefficients of variation and relative importance indices.

Table 3. Description and Diagnosis of the Digital Governance Variable and Its Dimensions

Item	Statement	Mean	SD	CV%	RI%
X1	The Council possesses technical devices and equipment commensurate with administrative work requirements.	3.303	1.071	32.431	66.053
X2	The Council maintains an electronic communications network that facilitates information exchange among its departments.	3.342	1.053	31.497	66.842
X3	The Council has digital systems and software that support the completion of administrative transactions.	3.224	1.127	34.949	64.474
X4	The digital platforms and systems used by the Council are characterized by ease of access and use.	3.355	0.976	29.081	67.105
Digital Infrastructure		3.306	0.883	26.704	66.118
X5	The Council's leadership possesses a clear vision	3.474	0.986	28.391	69.474

	regarding the transition to digital administration.				
X6	The Council's leadership supports the use of digital technologies in completing administrative tasks.	3.603	1.107	30.727	72.069
X7	The Council's leadership provides the resources necessary for the development of digital systems and services.	3.289	1.153	35.038	65.789
X8	The Council's leadership encourages employees to submit innovative ideas for developing digital operations.	3.474	1.013	29.159	69.474
Digital Leadership		3.434	0.920	26.791	68.684
X9	The Council implements clear policies to protect its digital data and information.	3.474	1.216	35.014	69.474
X10	The Council's digital systems employ appropriate procedures to verify user identities.	3.408	1.073	31.487	68.158
X11	Access privileges to data and digital systems are determined according to employees' responsibilities.	3.487	0.931	26.696	69.737
X12	Electronic protection tools and programs at the Council are updated on a regular basis.	3.368	1.056	31.359	67.368
Cybersecurity		3.434	0.905	26.351	68.684
X13	The Council makes information concerning its services and procedures available through digital means.	3.395	1.034	30.453	67.895
X14	The Council publishes administrative data and information — to the extent permitted — in a timely manner.	3.434	1.075	31.303	68.684
X15	The digital platforms clarify the stages and procedures for	3.289	1.004	30.528	65.789

	obtaining the services provided by the Council.				
X16	Stakeholders can easily track their transactions and obtain information through digital means.	3.066	1.112	36.258	61.316
Digital Transparency		3.296	0.877	26.614	65.921
Digital Governance (Overall)		3.366	0.805	23.904	67.325

Source: Compiled by the researcher using SPSS v.27

The statistical results of the level of digital governance at the Salah al-Din Governorate Council reached a moderate level tending to high with an overall mean of 3.366, with a relative importance of 67.325%, with a standard deviation of 0.805, and a coefficient of variation of 23.904%. These values reflect a relatively positive perception of digital governance practices among members of the sample, while showing that there is considerable room for development before digital applications move from partial practices to an integrated institutional system.

At the dimension level, digital leadership and cybersecurity ranked first together, with a mean of 3.434 each and a relative importance of 68.684% each. The importance of digital leadership is evidenced by employees' recognition of the Council's leadership role in supporting technology use and leading digital transformation, with X6 on leadership support for the use of technologies in administrative task completion having the highest mean within this dimension at 3.603 (relative importance: 72.069%). However, X7 related to the provision of resources needed to develop digital systems and services showed a lower mean of 3.289 – implying that the support of digital transformation at the leadership orientation level slightly surpasses the level of provision of its operational resources.

The importance of cybersecurity implies that data protection and access control are relatively prioritized by the Council. X11, regarding the determination of access rights according to the responsibilities of employees, had the highest mean in this dimension, 3.487 (relative importance: 69.737%), with the lowest coefficient of variation, 26.696% — showing a greater consensus among respondents for this item. The moderate means of the remaining items suggest that protection policies and periodic updates should be converted into more regular and well-communicated procedures for all personnel.

Digital infrastructure was ranked third with an average score of 3.306 and a relative importance of 66.118 percent. This means that there is an acceptable level of availability of devices, networks and software, but still not enough to support a full digital transformation. The ease of access to and use of platforms (X4) had the highest rating with a mean of 3.355, whereas the systems and software to support transaction completion (X3) were rated lowest with a mean of 3.224 and the highest standard deviation of 1.127 — indicating variation in employees' perceptions of the adequacy of the available software.

Digital transparency, with a mean of 3.296 and a relative importance of 65.921%, was the lowest scoring dimension and would be the most in need of improvement. X16, which was the extent to which stakeholders could monitor their transactions and get information in digital form, had the lowest mean of all the variables at 3.066 (relative importance: 61.316%) and the highest coefficient of variation of 36.258%. This indicates there is heterogeneity in the experiences of beneficiaries and that availability of information does not always match up to real capabilities of tracking digital transactions. So, portals tracking transactions must be created, information published updated, and explained electronic service stages and procedures.

2. Local Administration Efficiency

Table 4. Description and Diagnosis of Local Administration Efficiency

Item	Statement	Mean	SD	CV%	RI%
Y1	The Council completes its administrative transactions within the specified time limits.	3.571	0.856	23.968	71.429
Y2	The Council uses its human, financial, and technical resources in a rational manner.	3.145	1.128	35.866	62.895
Y3	The adopted work procedures contribute to reducing the time and effort required to complete transactions.	3.395	1.096	32.297	67.895
Y4	The Council responds to citizens' requests and needs with appropriate speed.	3.132	1.204	38.441	62.632
Y5	The Council updates its procedures to help improve the quality of local services.	3.421	1.074	31.397	68.421
Y6	The Council addresses administrative problems and obstacles effectively.	3.368	1.118	33.180	67.368
Y7	The Council achieves its administrative objectives and plans at the required level.	3.316	1.134	34.195	66.316

Local Administration Efficiency (Overall)		3.305	0.980	29.647	66.090

Source: Compiled by the researcher using SPSS v.27

Table (1) shows that the efficiency of local administration in the Salah al-Din Governorate Council was moderate tending toward high, with an overall mean of 3.305 and a relative importance of 66.090%, with a standard deviation of 0.980 and a coefficient of variation of 29.647%. This result suggests that the Council achieves a satisfactory performance in task execution and service development, although the relatively higher dispersion compared to the digital governance variable highlights the differences among the sample members regarding their views on existing administrative efficiency practices.

Y1 was ranked first with a mean of 3.571 and a relative importance of 71.429%, and with the lowest standard deviation (0.856) and coefficient of variation (23.968%) on the completion of transactions within the stipulated time limits, showing relative consensus that timely compliance is the most prominent aspect of efficiency at the Council. The next priority was to update procedures to improve service quality (Y5) with a mean of 3.421, followed by the contribution of work procedures to reducing time and effort (Y3) with 3.395. Thus, there is a general drive to improve procedures, but not a comprehensive one.

In contrast, the speed of the Council's responsiveness to citizens' requests and needs (Y4) recorded the lowest mean at 3.132 (relative importance: 62.632%) with the highest standard deviation (1.204) and coefficient of variation (38.441%) – reflecting marked variation in responsiveness assessments and possibly its differing nature by type of request or responsible department. Similarly, the rational use of resources (Y2) had a relatively low mean of 3.145, indicating two core areas for improvement: the redistribution of human, financial and technical resources according to workload volumes, and the development of rapid digital channels for receiving, tracking and responding to citizens' requests.

Fourth: Testing the Correlational and Causal Relationships Between Digital Governance and Local Administration Efficiency

This part provides an independent interpretation of each hypothesis of the correlational and causal relationship between digital governance and its dimensions and efficiency in local administration at the Salah al-Din Governorate Council. The interpretation is based on statistical values obtained from the field study and links them to the reality of administrative procedures and services provided to citizens. Correlational relationships explain the direction and strength of the relationship, while regression models show the magnitude of change that each dimension can explain on local administration efficiency. Correlation does not prove causality . Regression results in a cross-sectional study indicate explanatory and predictive power within the confines of the model and data used.

1. Correlation Hypotheses

Sub-Hypothesis 1: We find a statistically significant positive relationship between digital infrastructure and the efficiency of local administration.

The results of the test of Pearson's correlation show a positive correlation between digital infrastructure and the efficiency of local administration, which is statistically significant ($r = 0.640$, $p < 0.001$)—a moderate-to-strong positive correlation. The result shows that better availability of devices, communications networks, systems, software and ease of access to digital platforms is associated with higher local administration efficiency. Digital infrastructure enables faster transaction processing, reduced dependence on paper-based document processing and it helps departments share, save and retrieve information without the need to reenter data. In the Council's environment, a single transaction usually goes through more than one department or administrative unit. When networks are weak or systems are not integrated, communications are delayed and the probability of information loss or duplication increases. Conversely, an integrated infrastructure accelerates and streamlines data flow, and enables management to monitor progress and pinpoint bottlenecks. Therefore, Sub-Hypothesis 1 is accepted.

Sub-Hypothesis 2: Digital leadership has a positive correlation with local administration efficiency (statistically significant).

Pearson's correlation test results suggest a positive and statistically significant correlation between digital leadership and the efficiency of local administration ($r = 0.797$, $p < 0.001$), which is the highest correlation value among the digital governance dimensions. This means that the effectiveness of local administration is largely determined by the presence of leadership with a clear vision of digital transformation, which contributes to the use of technologies, the provision of the necessary resources, and the stimulation of the initiative and innovation of employees. Digital transformation is not simply about putting in place systems; it is about leadership that makes technology an ongoing institutional work practice. According to the Council, digital leadership is a key factor in the prioritization of digital projects, the coordination of work between departments, the overcoming of resistance to change, and the monitoring of compliance with system use. It also avoids the need to resort to paper procedures in the event of a technical or organizational problem, and associates the use of the system to performance indicators and administrative accountability. The strong correlation indicates that leadership decisions determine the amount of resources devoted to technologies, training and maintenance, and the extent to which data are used in decision-making. Thus, Sub-Hypothesis 2 is accepted.

Sub-Hypothesis 3: There is a statistically significant positive relation between cybersecurity and the efficiency of local administration.

The results of the Pearson correlation test indicate a positive and statistically significant correlation between cybersecurity and local administration performance ($r = 0.787$, $p < 0.001$). The correlation is strong and positive which indicates that data protection, user identity verification, access control and protection program updates are related to higher local administration efficiency. Cybersecurity is not a technical activity separate from performance, but a prerequisite for the continuity of digital services, the integrity of information and the reliability of administrative decisions. The Council manages data and information of administrative, financial and service nature about citizens, projects and contracts.

Unauthorized loss or alteration of this data could interrupt operations, delay transactions, require repetition of procedures, and harm beneficiary trust. Protection measures, data backups, and access control, in contrast, limit errors and define responsibility for data entry, modification, and approval. Hence, Sub-Hypothesis 3 is accepted

Sub-Hypothesis 4: There exists a statistically significant positive association between digital transparency and the efficiency of local administration.

Pearson's correlation test results point to a positive and statistically significant correlation between digital transparency and local administration efficiency ($r = 0.746$, $p < 0.001$). This result shows that there is a positive correlation between higher local administration efficiency and making information available digitally, publishing permissible data in a timely manner, clarifying the stages and procedures for services, and enabling stakeholders to follow up their transactions. Digital transparency means beneficiaries get standardized information, citizens don't have to keep coming back for information and there is less pressure on staff. If a citizen knows what documents are required, the stages of a transaction and the time expected to process then there are fewer incomplete submissions and less wasted time on re-filing. Tracking of electronic transactions encourages departments to meet deadlines as delays are subject to monitoring and accountability. This is thus accepted as Sub-Hypothesis 4.

At the aggregate level, the Pearson's correlation test indicates a very strong, positive and statistically significant correlation between the overall digital governance and local administration efficiency ($r = 0.828$, $p < 0.001$). The results indicate that the efficiency of local administration clearly increases with higher levels of integrated digital governance. The overall correlation coefficient was also higher than that of individual dimensions confirming that efficiency does not come through a single dimension but through the integration of digital infrastructure, leadership, cybersecurity and digital transparency. Primary Hypothesis One is therefore accepted.

Table 5. Correlational Relationships Between Digital Governance and Local Administration Efficiency

Variable / Dimension	**r**	**Sig.**
Digital Infrastructure	0.640**	0.000
Digital Leadership	0.797**	0.000
Cybersecurity	0.787**	0.000
Digital Transparency	0.746**	0.000
Digital Governance (Overall)	0.828**	0.000

** Correlation is significant at the 0.001 level. Source: Compiled by the researcher using SPSS v.27

2. Effect Hypotheses

Sub-Hypothesis 1: The digital infrastructure has a statistically significant positive impact on the efficiency of local administration.

The results indicate that digital infrastructure has a statistically significant positive effect on local administration efficiency ($R^2 = 0.410$). This means that digital infrastructure can explain 41% of the variance in local administration efficiency, while the remaining 59% is explained by other factors outside the model. The effect size coefficient is $\beta = 0.640$ – a moderate-to-strong positive effect – which means that a one standard deviation increase in digital

infrastructure is associated with a 0.640 standard deviation increase in local administration efficiency (t = 7.174; F = 51.469; p ≤ 0.001). The result shows that provision of devices, networks, systems, software and ease of use contribute to the acceleration of transactions processing, ease in information exchange and reduction of time, effort and errors. However, this dimension had the least explanatory power of all dimensions, confirming that technology provision alone does not achieve the requisite efficiency without supportive leadership, cybersecurity, transparency and digital skills. Thus, Sub-Hypothesis 1 is supported.

Sub-Hypothesis 2: The digital leadership had a statistically significant positive effect on the efficiency of the local administration.

The results show a strong, statistically significant positive effect of digital leadership on local administration efficiency (R2 = 0.635) — the strongest explanatory power among the digital governance dimensions — indicating that digital leadership explains 63.5% of the variance in local administration efficiency, the remaining 36.5% is explained by other factors. The standardized effect coefficient was β = 0.797 (t = 11.344; F = 128.683; p ≤ 0.001). The result suggests that the strong driver of improvement in task-completion speed, service quality and rational resource use is the clear digital vision of the Council's leadership, support for the use of technology, provision of resources, encouragement of innovation and monitoring of system implementation – because technology produces results only when it is turned into a binding institutional practice by a leadership decision. Hence the acceptance of the sub-hypothesis 2.

Sub-Hypothesis 3: Cybersecurity has a positive and statistically significant impact on the efficiency of local administration.

The results confirm a strong positive effect of cybersecurity on the efficiency of local administration , statistically significant . This means that cybersecurity explains 61.9% of the variance in the efficiency of local administration, and 38.1% is explained by other factors outside the model. The standardized coefficient of the effect is β = 0.787 (t = 10.968; F = 120.787; p ≤ 0.001). The result shows that data protection, user identity verification, access privilege regulation, protection program updating and data backup are helpful to ensure system continuity, reduce errors and risk of information loss and prevent transaction disruption so that cybersecurity is a basic operational efficiency requirement and not a separate technical measure. Hence, Sub-Hypothesis 3 is accepted.

Sub-Hypothesis 4: Digital transparency has a positive and statistically significant impact on the efficiency of local administration.

The findings indicate that digital transparency has a statistical significant positive impact on efficiency of local administration (R2 = 0.556) which means that digital transparency is explained for 55.6% of the variance of local administration efficiency and 44.4% of the variance is explained by factors outside the model. The standardized effect coefficient is β = 0.746 (t = 9.636; F = 92.851; p ≤ 0.001 . The result shows that making information available digitally, publishing service procedures and requirements and allowing citizens to track their transactions help to reduce ambiguity and repeated visits, relieve pressure on staff and identify delays and accountability. Therefore, sub-hypothesis 4 is accepted.

At the aggregate level, the effect of digital governance on the efficiency of local administrations is very strong statistically significant and positive (R2 = 0.685; β = 0.828; t = 12.679; F = 160.762; p < 0.001) explaining 68.5% of the variance of efficiency. The result shows that the combination of digital infrastructure, digital leadership, cybersecurity, and digital transparency

has a positive effect on the speed of task completion, quality of service, responsiveness, and rational use of resources. The combined use of these dimensions produces greater efficiency than the use of any one of these dimensions alone. All hypothesis are accepted accordingly.

Table 6. Effect of Digital Governance and Its Dimensions on Local Administration Efficiency

Variable / Dimension	R^2	F	t	β	Sig.
Digital Infrastructure	0.410	51.469	7.174	0.640	0.001
Digital Leadership	0.635	128.683	11.344	0.797	0.001
Cybersecurity	0.619	120.787	10.968	0.787	0.001
Digital Transparency	0.556	92.851	9.636	0.746	0.001
Digital Governance (Overall)	0.685	160.762	12.679	0.828	0.000

Source: Compiled by the researcher using SPSS v.27

Section Four: Conclusions, Recommendations, and Implementation Mechanisms

First: Conclusions

1. The digital governance level at the Salah al-Din Governorate Council was moderate tending to high (Mean = 3.366; Relative Importance = 67.325%), which indicates the presence of an acceptable digital foundation not yet reaching the level of integrated institutional maturity. The lowest ranking dimension was digital transparency, especially the ability of stakeholders to track their transactions digitally.
2. Digital leadership and cybersecurity were tied for first place (mean = 3.434 each), highlighting relatively more focus on the leadership orientation and data protection. However, the lower score for provision of digital resources confirms the gap between declared leadership support and real needs of implementation .
3. Efficiency of local administration (Moderate to high) (mean = 3.305; relative importance = 66.090%). The most important strength was the respect of the established deadlines. The most important weaknesses were the speed of response to requests from citizens and the rational use of resources.
4. The normality and reliability tests indicated that the data and instrument were suitable for analysis, with skewness and kurtosis values falling into the acceptable range. Cronbach's alpha coefficients ranged from 0.934 to 0.955, indicating high internal consistency and reliability of the findings.
5. Table 11. The results show a very strong positive correlation between digital governance and local administration efficiency ($r = 0.828$; $p < 0.001$). Digital leadership had the highest correlation ($r = 0.797$) and confirmed the association of digital dimensions integration with a clear improvement in efficiency.
6. Results confirmed a significant positive effect of digital governance on local administration efficiency accounting for 68.5% of the variance ($\beta = 0.828$). The strongest effect was found for digital leadership ($R2 = 0.635$), followed by cybersecurity, digital transparency, and digital infrastructure.

Second: Recommendations

1. Develop an integrated digital governance road map that links infrastructure development and systems to leadership, security and transparency with clear priorities for evolving from siloed applications to unified institutional system.
2. Enhance digital transparency, in particular by empowering citizens and stakeholders to follow their transactions electronically and to know the stages of completion, time limits and responsibilities clearly.
3. Strengthen digital leadership by translating vision and support into resources, budgets, mandates and implementation projects and by encouraging staff to propose digital solutions and improve procedures.
4. Continually upgrade the cybersecurity system to ensure data security and the continuity of digital services, including access control, protection system updates, and personnel's security awareness raising.
5. Re-engineer the process and connect administrative units through a common platform for requests, complaints and services to improve the speed of citizen responsiveness and increase the rationality of resource use.
6. Establish a periodic system for measuring digital governance maturity and local administration efficiency and link the results of measurements to administrative evaluation, improvement plans and institutional accountability.

Third: Implementation Mechanisms

1. Constitute a high committee for digital transformation and governance under empowered administrative leadership to prepare a phased 12-18 months roadmap of projects, responsibilities, budgets, performance indicators and completion ratios, in not more than 3 months.
2. Develop a single service portal, which provides an electronic tracking number for each transaction and displays stages of completion, estimated time for processing, documents required and grievance channels. Monthly update and reporting of the share of transactions tracked electronically.
3. Establish a digital leadership program including training for senior leadership and department heads, an annual digital transformation budget, and an internal innovation team to receive and pilot proposals, recognizing solutions that save time, money or process steps.
4. Create a written cybersecurity policy that includes multifactor authentication, quarterly review of access privileges, periodic updates, backups, recovery testing and semi-annual incident response drills with documentation of observations and corrective actions.
5. Create an electronic system for management of citizens requests and complaints and for execution of the requests within the publicly announced service time limits. Re-engineer the procedures that cause highest delays. Redistribute the resources according to the volume of transactions. Measure the average time for response and the percentage of requests completed within the designated time.
6. Create a digital dashboard for indicators that will report monthly on system availability levels, transaction processing times, security incidents, percentage of services that are electronically available and trackable and beneficiary satisfaction. Results should be

reviewed quarterly and corrective plans approved with assigned responsibilities and timelines.

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