DIGITAL LEADERSHIP AND ITS IMPACT ON THE EFFICIENCY AND EFFECTIVENESS OF ADMINISTRATIVE DECISIONS THROUGH DIGITAL TRANSFORMATION. AN ANALYTICAL STUDY OF THE OPINIONS OF A SAMPLE OF SENIOR AND MIDDLE MANAGEMENT LEADERS AT WASIT UNIVERSITY

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Abstract. This study examines digital leadership and its impact on the efficiency and effectiveness of administrative decision-making within the context of digital transformation. It aims to develop a theoretical framework based on previous studies addressing the concept of digital transformation, along with an empirical analytical framework derived from respondents' opinions. The study was conducted on a sample of senior and middle management staff at Wasit University, including deans, assistant deans (administrative and academic), and heads of departments. The total number of participants was 68.

Digital leadership is considered the independent variable and is measured through four dimensions: digital competence, digital citizenship, digital insight, and digital strategy. Administrative decision-making is the dependent variable and is measured through two dimensions: decision efficiency and decision effectiveness. Digital transformation is introduced as a mediating variable and is represented through four dimensions: human requirements, technological infrastructure, digital culture, and digital skills development.

The questionnaire was used as the primary data collection tool. The study employed several statistical methods, including Pearson correlation analysis, t-test, multiple regression analysis, F-test, and coefficient of determination (R^2), in order to examine relationships among variables and measure the impact of the independent variable on the dependent variable.

The findings indicate a significant positive relationship between digital leadership and administrative decision-making. Furthermore, digital transformation plays a mediating role, confirming that the effectiveness of administrative decisions depends largely on the level of digital maturity within the institution.

The study recommends adopting an integrated strategic approach that links digital leadership with digital transformation to enhance organizational performance, efficiency, and sustainability.

Keywords: digital leadership, administrative decision-making, decision efficiency, decision effectiveness, digital transformation, Wasit University.

ЦИФРОВОЕ ЛИДЕРСТВО И ЕГО ВЛИЯНИЕ НА ЭФФЕКТИВНОСТЬ И РЕЗУЛЬТАТИВНОСТЬ АДМИНИСТРАТИВНЫХ РЕШЕНИЙ ЧЕРЕЗ ЦИФРОВУЮ ТРАНСФОРМАЦИЮ. АНАЛИТИЧЕСКОЕ ИССЛЕДОВАНИЕ МНЕНИЙ ВЫБОРКИ РУКОВОДИТЕЛЕЙ ВЫСШЕГО И СРЕДНЕГО ЗВЕНА УНИВЕРСИТЕТА ВАСИТ

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Аннотация. Данное исследование рассматривает цифровое лидерство и его влияние на эффективность и результативность принятия административных решений в условиях цифровой трансформации. Целью работы является формирование теоретической рамки на основе ранее проведённых исследований, посвящённых концепции цифровой трансформации, а также построение эмпирико-аналитической модели, основанной на мнениях респондентов.

Исследование было проведено на выборке руководителей высшего и среднего звена Университета Васит, включая деканов, заместителей деканов (по административным и академическим вопросам), а также заведующих кафедрами. Общее число участников составило 68 человек.

Цифровое лидерство рассматривается как независимая переменная и измеряется четырьмя измерениями: цифровая компетентность, цифровое гражданство, цифровая проницательность и цифровая стратегия. Принятие административных решений выступает зависимой переменной и измеряется через два измерения: эффективность решений и результативность решений. Цифровая трансформация выступает в роли медиирующей переменной и представлена четырьмя компонентами: человеческие требования, технологическая инфраструктура, цифровая культура и развитие цифровых навыков.

В качестве основного инструмента сбора данных использовалась анкета. Для анализа данных применялись статистические методы, включая корреляционный анализ Пирсона, t-критерий, множественный регрессионный анализ, F-критерий и коэффициент детерминации (R^2), с целью изучения взаимосвязей между переменными и оценки влияния независимой переменной на зависимую.

Результаты исследования показали наличие значимой положительной связи между цифровым лидерством и процессом принятия административных решений. Кроме того, цифровая трансформация играет медиирующую роль, подтверждая, что эффективность административных решений во многом зависит от уровня цифровой зрелости организации.

Исследование рекомендует внедрение интегрированного стратегического подхода, объединяющего цифровое лидерство и цифровую трансформацию, для повышения организационной эффективности, результативности и устойчивого развития.

Ключевые слова: цифровое лидерство, принятие административных решений, эффективность решений, результативность решений, цифровая трансформация, Университет Васит.

Introduction

Digital transformation is a fundamental pillar for keeping pace with the advanced era, as it represents an institutional transformation and a revolution in service delivery, aimed at increasing efficiency and effectiveness. The success of this transformation requires facing many challenges and initiatives that have been undertaken by many countries.

The success of digital transformation and change is closely related to a new type of leadership, namely digital leadership, which provides a scientific vision and a modern approach that aligns with the digital era. It helps bring about changes in employee behavior and performance and facilitates the transition from a traditional society to an information and communications revolution society characterized by growth, innovation, and creativity in all fields.

To achieve this, institutions need this new type of leadership equipped with high technological skills and a digital strategic vision, which facilitates and contributes to the success of digital transformation. Therefore, information and digital technology have become an urgent necessity for organizations today in order to achieve the desired competitive advantage (Khaw et al., 2022).

Accordingly, it is necessary to select the correct and appropriate model from among multiple models in building digital operations to make high-quality decisions. Thus, achieving the desired goals requires effective administrative decisions, which are those decisions that depend on a high level of accurate, timely, and high-quality information.

In this context, such quality is rarely available except through the use of digital technology and the adoption of a digital leadership model, which helps overcome obstacles, improve quality, and enhance administrative decision-making.

Digital leadership effectively relies on data and analysis and plays a decisive role in improving the quality of administrative decisions.

Research Methodology

First: Research Problem

The research problem can be clarified through the following questions:

1) What is the level of impact of digital leadership on the efficiency and effectiveness of administrative decision-making at the university under study?

2) What is the impact of digital transformation on the efficiency and effectiveness of decision-making at the university under study?

3) Do the combined dimensions of digital leadership have an impact on the efficiency and effectiveness of administrative decisions within the university under study, as reflected in the mediating role of digital transformation?

Second: Importance of the Research

1) This study benefits administrative leaders in various colleges of the university by developing a scientific digital vision that is aligned with the requirements of the current era and its digital needs.

2) Identifying the most important obstacles that hinder the implementation of this concept at the university under study.

Third: Research Objectives

1. Focusing on a contemporary administrative approach, namely digital leadership, and its role in improving the efficiency and effectiveness of administrative decision-making through digital transformation.
2. Highlighting the technological skills and digital mindset required for effective leadership in the digital age and its role in enhancing and accelerating administrative decision-making at the university through digital modernization, in order to achieve a higher level of performance and effectiveness.
3. Clarifying the relationship between digital leadership and the efficiency and effectiveness of administrative decision-making through digital transformation at the university.

Fourth: Research Hypotheses

Based on the problem, its importance, and the objectives it seeks to achieve, a set of main and sub-hypotheses was formulated as follows:

First main hypothesis:

There is a statistically significant effect between digital leadership and managerial decision-making.

Second main hypothesis:

There is a statistically significant effect between digital transformation and administrative decision-making.

Third main hypothesis:

There is a significant effect of digital leadership on digital transformation.

Fourth main hypothesis:

There is a significant effect between digital leadership and administrative decision-making through the mediating role of digital transformation.

Theoretical Framework of the Research

First: Digital Leadership

Digital leadership is not only about the use of technology; rather, it represents a strategic approach to an organizational culture that focuses on achievement and participation (Domeny, 2017). It revolves around how to benefit from the opportunities provided by the digital era and represents a completely different structure compared to traditional leadership models. In this context, leadership is no longer limited to predefined paths but is based on flexible learning opportunities and areas of interest aimed at improving institutions and their leaders (Abu Bakr & Al-Suwaiti, 2024, p. 166).

Digital leadership refers to the rethinking, reimagining, and renewal of the concept of leadership within the context of the technological revolution, which places digital technology at its core. It enables individuals and organizations in the digital era to lead others and create space for digital thinking through digital

insight, digital decision-making, digital implementation, and digital guidance to ensure the achievement of organizational goals (Bartsch et al., 2020).

It is not limited to individuals who are experts in computing or programming; rather, it refers to individuals who can lead organizations through the effective use of modern information and communication technologies in the digital age (Hussein & Aasi, 2024, p. 102; Robbins & Judge, 2009). The concept also includes leaders operating in a digital environment with previously unfamiliar dynamics and non-traditional communication systems (Nouri & Muhammad, 2022, p. 164).

Digital leadership contributes to facilitating decision-making processes and enables managers and leaders to plan efficiently and effectively in order to respond to work requirements (Al-Ammari, 2022). It also ensures high-quality performance in accordance with technical and technological standards required to keep pace with contemporary developments (Abdul Karim & Muhammad, 2025, p. 168).

Thus, digital leadership is not a fixed concept; rather, it evolves over time as society becomes more digital and is influenced by several factors such as infrastructure development, social changes, and innovative work patterns in the digital era. Accordingly, digital leadership reflects the ability of decision-makers to understand digital opportunities and challenges and to navigate within them.

This requires both technical skills and a digital mindset for effective leadership in the digital age (Kashkool et al., 2024, p. 25). All leaders across different fields are now required to overcome new constraints and provide opportunities related to information and communication technologies in an effective way (Collin et al., 2015; Al-Ta’i & Al-Hadrawi, 2019, p. 23).

At the same time, digital leadership allows employees to work more independently and with greater flexibility regarding their workplace, as they are no longer restricted to a single location. It provides multiple communication channels and enhances flexibility, which improves knowledge management and fosters the

development of new work methods and organizational structures (Al-Khafaji et al., 2022, p. 712).

Therefore, digital leadership is an integrated model aimed at achieving organizational excellence. It is based on a digital leader who embodies vision, values, culture, collaboration, communication, and the ability to make decisions and manage virtual teams (Jameson et al., 2022; Al-Jiyousi, 2013, p. 13).

Its importance lies in supporting administrative staff in simplifying procedures and managing information more efficiently and less complexly. It also facilitates participation in decision-making processes and reduces bureaucratic hierarchy (Al-Shamrani, 2023, p. 504).

In addition, it enables departments and leaders to plan efficiently and effectively to meet work requirements and deliver high-quality outputs according to modern technical standards (Kamal & Mahmoud, 2022, p. 166). Digital leadership is characterized by its independence from time and place constraints and relies heavily on information technology, which reduces the effort required from leaders (Al-Aqtaash, 2019).

According to Hassan (2011), digital leadership requires technological awareness, where leaders are sensitive to technological developments in hardware, software, networks, and applications. It also requires qualifications characterized by competitiveness, the ability to face challenges, and a high level of human awareness.

Effective digital leadership requires a shift in managerial thinking and a modern approach to educational and administrative responsibilities in line with technological advancement (Obaid, 2024, p. 67). It also requires individuals with innovative competencies capable of developing communication networks between stakeholders, using various applications, and managing organizations electronically in a correct and efficient manner.

Digital leadership can therefore be defined as a practical approach to developing a culture of innovation and sustaining it through the adoption of ideas

that can be rapidly implemented using information technology and systematic organizational processes (Montaser, 2024, p. 935).

Theoretical framework of the research

First: Digital Leadership

Digital leadership in reality is not only the use of technology, but a strategic view of organizational culture that focuses on achievement and participation (Domeny, 2017). It concerns the ability to benefit from opportunities provided by the digital era, which represents a fundamentally different structure compared to traditional leadership models (Abu Bakr & Al-Suwaiti, 2024, p. 166).

Digital leadership involves rethinking, reimagining, and renewing the concept of leadership in the context of the technological revolution. It places digital technology at the center, enabling individuals and organizations to lead effectively in the digital era through digital insight, decision-making, implementation, and guidance to achieve organizational goals (Bartsch et al., 2020; Hussein & Aasi, 2024, p. 102).

It is not limited to technical expertise or programming skills, but refers to the ability to manage organizations using modern ICT tools (Robbins & Judge, 2009). It also reflects leadership in a digital environment where traditional physical interaction is reduced (Nouri & Muhammad, 2022, p. 164).

Digital leadership contributes to facilitating decision-making and improving planning efficiency, while ensuring high-quality performance aligned with technological standards (Al-Ammari, 2022; Abdul Karim & Muhammad, 2025, p. 168).

It is not a fixed concept but continuously evolving with digital transformation, infrastructure development, and innovation. Therefore, digital leaders must understand digital opportunities and challenges, and possess both technical and cognitive skills (Kashkool et al., 2024, p. 25).

Digital leadership also enhances flexibility, remote communication, and knowledge management, allowing employees greater independence and improving organizational structures (Al-Khafaji et al., 2022, p. 712).

Its importance lies in simplifying administrative procedures, improving information management, supporting decision-making participation, and reducing hierarchical barriers (Al-Shamrani, 2023, p. 504).

Accordingly, digital leadership can be defined as a practical approach aimed at fostering innovation and effective organizational development through ICT adoption and rapid implementation of ideas (Montaser, 2024, p. 935).

Dimensions of Digital Leadership

1. Digital Proficiency

Digital proficiency refers to the leader's possession of essential technological knowledge and skills, including understanding and effectively using modern digital technologies in management processes (Kadhim et al., 2025, p. 63).

It also includes continuous learning, self-development, and participation in digital learning communities. Additionally, digital leaders must be capable of managing distributed work environments and virtual networks, encouraging innovation and testing new ideas while addressing problems from multiple perspectives (Montaser, 2024, p. 951).

2. Digital Citizenship

Digital citizenship refers to the values and responsible behaviors adopted by individuals when interacting with digital technologies (Bashir, 2025, p. 534). It requires ensuring access to technological resources, adopting digital platforms, and aligning leadership practices with technological developments. Integrating digital citizenship enhances communication with stakeholders and improves responsiveness to internal and external digital changes (Obaid, 2024, p. 82).

3. Digital Insight

Digital insight refers to the leader's ability to analyze current and future challenges and to develop a clear vision for organizational growth. It enables

leaders to identify opportunities in complex environments and make faster, data-driven decisions in response to rapid technological changes, thereby ensuring competitive advantage (Al-Harbi, 2025, p. 183; Al-Hadrawi & Shaker, 2023, p. 319).

4. Digital Strategy

Digital strategy refers to the planned use of digital technologies to improve organizational performance and achieve strategic objectives.It supports performance evaluation using benchmarking systems and enables leaders to identify strengths, weaknesses, opportunities, and threats. It also focuses on adopting modern technologies across all organizational activities to achieve predefined performance indicators (KPIs) and improve competitiveness (Al-Shanwani, 2023; Al-Ghamdi, 2025, p. 559).

Second: The efficiency and effectiveness of the administrative

Decision efficiency and effectiveness of administrative decisions

Concept of administrative decision

The administrative decision is a practical process essential for organizations, used to address problems and develop organizational activities. The success or failure of an organization largely depends on the quality of its decisions, as effective decisions play a pivotal role in overcoming problems efficiently (Al-Sayed & Aql, 2022, p. 62).

When a manager assumes a leadership role, they make a series of decisions related to directing employees, coordinating efforts, motivating staff, and solving organizational problems. In general, most managerial actions are the result of decision-making processes, regardless of their outcomes. A decision is a mental judgment that precedes action (Al-Mashout, 2023, p. 3211).

Administrative decision-making is a process that considers the organizational environment, anticipates potential obstacles, and analyzes problems that may affect effectiveness. Therefore, decision-makers must carefully evaluate possible challenges and work to avoid or solve them (Al-Hamadat, 2006).

Decision-making is one of the most difficult administrative tasks, as it involves selecting the most appropriate alternative among several options, distinguishing between urgent and important issues, and determining the correct course of action (Al-Zoubi & Al-Shayab, 2018, p. 303).

The importance of administrative decisions stems from the responsibility placed on managers. A decision is defined as a conscious selection of one alternative among several to solve a specific problem (Abbas, 2011). It represents a behavioral choice made after analyzing a given situation and determining appropriate actions or avoiding undesirable ones (Abdel-Aal, 2017, p. 34).

Thus, decision-making is considered the core of the administrative process, as organizational success depends heavily on the ability of leadership to make sound and effective decisions (Al-Baraki, 2023, p. 398).

Effectiveness of the decision

Decision effectiveness depends on the ability of the decision-maker to select the most appropriate alternative among available options. This requires scientific analysis, accurate evaluation of reality, and access to sufficient information about the problem and its alternatives before making a decision (Kanaan, 1999).

An effective decision is made within a comprehensive understanding of the organization and its environment, not based on a narrow or temporary view of the problem. It requires balancing risks and benefits of each alternative before implementation (Al-Ghazali, 2012, p. 43).

An effective decision is not merely a theoretical choice but one that produces real impact and achieves intended results. It is not a weak or symbolic action but a practical decision that influences organizational performance. Effective managers focus on making fewer but more impactful decisions rather than many minor ones (Al-Hawari, 2006).

Effectiveness also refers to decisions that are implemented successfully and produce tangible outcomes, not just intentions or recommendations. It requires real participation in decision formulation and execution (Ibrahim, 2015, p. 70).

According to Muhannad (2006), decision effectiveness depends not only on making the decision but also on considering all relevant facts objectively to achieve desired goals. Al-Ghazali (2012) adds that effective decision-making includes ease of implementation, acceptance by stakeholders, and improved decision quality.

Improving decision effectiveness

Organizations can improve decision effectiveness through:

- forming qualified decision-making teams,
- training and developing managerial skills,
- applying professional and ethical standards in decision-making,
- improving group decision quality through structured collaboration (Abu Samra, 2014, p. 40).

Difference between efficiency and effectiveness

Although efficiency and effectiveness are interrelated, they are conceptually different.

- **Efficiency** refers to achieving results with minimum resource use (input-output ratio).
- **Effectiveness** refers to the extent to which organizational goals are achieved.

Al-Alaq (1983) defines efficiency as the optimal use of resources to obtain desired outputs, while effectiveness refers to achieving the intended results regardless of resource consumption. Barnard distinguishes between them by stating that effectiveness relates to achieving organizational goals, while efficiency relates to satisfying individual needs and motivations within the organization. Ultimately, an organization is considered effective when it achieves its objectives and efficient when it uses its resources optimally (Muhanna, 2006, p. 52).

Definition of an effective decision

An effective decision is one that achieves organizational goals and maintains an acceptable balance between means and objectives within specific environmental conditions (Al-Hassani, 2013, p. 47).

Decision Efficiency

The concept of efficiency dates back to the Italian economist Vilfredo Pareto, who developed the idea of optimal resource allocation, later known as the Pareto optimum. According to Pareto, any allocation of resources is either efficient or inefficient, where inefficiency reflects suboptimal use of resources.

Drucker (1974) defines efficiency as doing things correctly or in the best possible way. It refers to the optimal use of available human and material resources at the lowest possible cost. In this sense, efficiency focuses on maximizing value while minimizing costs and waste.

Decision efficiency refers to the ability to achieve outputs using the least possible inputs. It reflects the economic dimension of decision-making, where goals are achieved through rational resource utilization. Efficiency can be measured through the ratio of useful outputs to total inputs, requiring decision-makers to manage limited resources effectively and reduce unnecessary consumption of time, effort, and materials (Hassan & Al-Ajami, 2013, p. 196).

In general, efficiency means achieving specific goals with minimum resource use. It requires simplifying operations, improving processes, and adopting cost- and time-saving strategies. In this context, efficiency is closely related to productivity and operational optimization (Al-Shammari, 2025, p. 708).

Finally, it is important to note that successful administrative decisions require both efficiency and effectiveness; a good decision is one that achieves objectives while using resources optimally (Anfal & Shaima, 2025, p. 47).

Digital Transformation (DT)

Digital transformation is one of the most important contemporary topics, increasingly adopted by organizations globally, especially after the Fourth Industrial Revolution. It integrates technologies such as artificial intelligence, cloud computing, Internet of Things, robotics, and 3D printing into organizational processes, enabling significant improvements in performance and connectivity between the physical and virtual worlds (Shalfouh, 2024, p. 9).

Digital transformation is not limited to automation of existing processes but requires a comprehensive rethinking of how organizations operate and interact with their environment (Al-Sayed, 2020; Darbas, 2025, p. 63). It represents a fundamental organizational shift aimed at improving services and facilitating access for beneficiaries (Sharif Shaheen, 2013).

Digital transformation also means redesigning organizational processes to make services faster, simpler, and more efficient for users (Eid, 2021, p. 9). Its success depends on several prerequisites, including human competencies, technological infrastructure, data analytics systems, appropriate policies and procedures, and continuous training programs (Al-Jafou & Al-Harbi, 2025, p. 487).

According to Hassan et al. (2022), digital transformation improves employee performance by reducing costs, increasing information accuracy, enhancing communication, and accelerating decision-making processes (Abu Salem, 2019, p. 8). It also contributes to innovation, organizational development, and changes in how individuals think and interact within society (Balqadi, 2024, p. 694).

However, digital transformation faces several challenges, including resistance to change, lack of financial and technological resources, insufficient leadership support, and shortage of qualified human capital (Zaid, 2023; Khamkham et al., 2025, p. 102).

Successful digital transformation requires employee participation at all levels, continuous communication, strong top management support, and an organizational culture that embraces change and innovation (Maor et al., 2017; Abu Ghubn & Al-Madhoun, 2023, p. 34).

In conclusion, digital transformation can be defined as a comprehensive organizational change driven by digital technologies to improve processes, enhance service quality, and accelerate service delivery. It aims to achieve digital maturity through the simplification and optimization of administrative procedures (Abdul Nabi & Al-Jarbu, 2025, p. 3).

Dimensions of Digital Transformation

1. Human Requirements

Human resources are the essential element for the success of the digital transformation process. This is achieved by providing qualified and trained personnel with advanced digital skills in the use of information technology, data analysis, and effective decision-making (Allam, 2022). Furthermore, human resources must possess a thorough understanding and strategic vision of the inevitability of the transition toward digitalization (Belkadi, 2024, p. 596).

Human resources are a fundamental element that cannot be separated from the digital transformation process in institutions. Therefore, it is necessary to provide a workforce capable of dealing with data and analyzing it to make effective decisions. This process requires planning and implementation, a clear vision, human competencies and experience, as well as belief in the importance of change and development (Anfal & Shaima, 2025, p. 6). In other words, it includes human competencies and digital specializations that possess professional technical abilities in this field (Ashqar, 2022, p. 7).

2. Technological Infrastructure

This refers to the set of hardware and software components and communication systems that provide the necessary foundation for operating and developing digital systems and service applications. It also includes updating systems, networks, and devices to ensure compatibility with modern technologies.

The basic structure of information technology enables institutions to deploy platforms, devices, and related software systems. The technological infrastructure contributes to the efficiency of organizational performance in implementing digital platforms and participating in service delivery and data management systems. It also supports communication applications designed for internal organizational systems.

A flexible IT infrastructure enhances the generation and distribution of information, thereby strengthening the organization’s competitiveness in dynamic

environments and improving its competitive advantage (Gharbi et al., 2024, p. 493).

3. Digital Literacy

Digital literacy is the ability to confidently use computers and electronic services to keep up with modern society and participate effectively in it. Its essence lies in enabling individuals to use digital applications with confidence in performing their professional and personal tasks within society (Abd al-Qadir, 2019).

It refers to the set of skills and knowledge necessary for participation in key technology-based activities, including the use of computers, data access, storage, retrieval, production, and communication through networks (Abu Amer, 2019). Previous definitions indicate that digital culture is a broad concept, but they all agree that it involves the ability to process, store, and access information easily.The most important areas of digital literacy include the availability of knowledge and skills that enable individuals to use electronic devices and smart applications on mobile phones or computers, as well as the ability to build virtual relationships with others (Assaf, 2023, p. 466).

4. Developing Digital Skills

Digital skills refer to the set of knowledge and abilities required for individuals to use information and communication technologies effectively in performing job tasks and improving productivity in the workplace. These skills also enable individuals to efficiently use digital tools, software, and systems to achieve organizational goals and professional development. They further help individuals adapt to rapid technological changes in the work environment and contribute to increasing productivity (Attia, 2025, p. 123).

The Practical Aspect of the Research

First: Confirmatory Factor Analysis of the Research Variables

Confirmatory Factor Analysis of the Digital Leadership Variable:

Figure (1) presents the results of the confirmatory factor analysis of the Digital Leadership scale. This variable consists of four main dimensions: digital insight, digital strategy, digital competence, and digital citizenship, comprising 20 items. Table (1) shows that all goodness-of-fit indicators fall within acceptable standard thresholds, which confirms the suitability of the proposed model for the study data and validates the factorial structure of the scale.

The results indicate that both standardized and unstandardized Cronbach's alpha values for all dimensions were higher than 0.70, indicating a high level of internal consistency. In addition, composite reliability values exceeded the minimum acceptable threshold, which strengthens the reliability of the measurement.

The average variance extracted (AVE) values exceeded 0.50, indicating convergent validity and the ability of the dimensions to sufficiently explain the variance of their items. Therefore, these results confirm the high quality of the Digital Leadership construct and its suitability for testing structural relationships.

All items of the Digital Leadership variable were statistically significant, as the estimated values ranged between 0.626 and 0.855, and the t-values ranged between 4.812 and 7.784, which is higher than the tabulated value of 1.984 at a significance level of 0.05. The p-values were also less than 0.05, confirming the statistical significance of the path coefficients and the construct validity of the measurement model.

Table (1): Evaluation of the quality of the Digital Leadership variable

Average variance Extract (AVE)	Compound stability (rho_c)	Cronbach's Alpha is not Standardization	Alpha Cronbach Standardization	Dimensions of the driving variable Digital
0.501	0.829	0.819	0.825	DC

0.559	0.863	0.865	0.867	DCO
0.541	0.849	0.857	0.860	DI
0.510	0.841	0.839	0.842	DL
0.5 ≤	0.70≤	0.70≤	0.70≤	Standard

Source: Outputs of the (Smart Pls4) program.

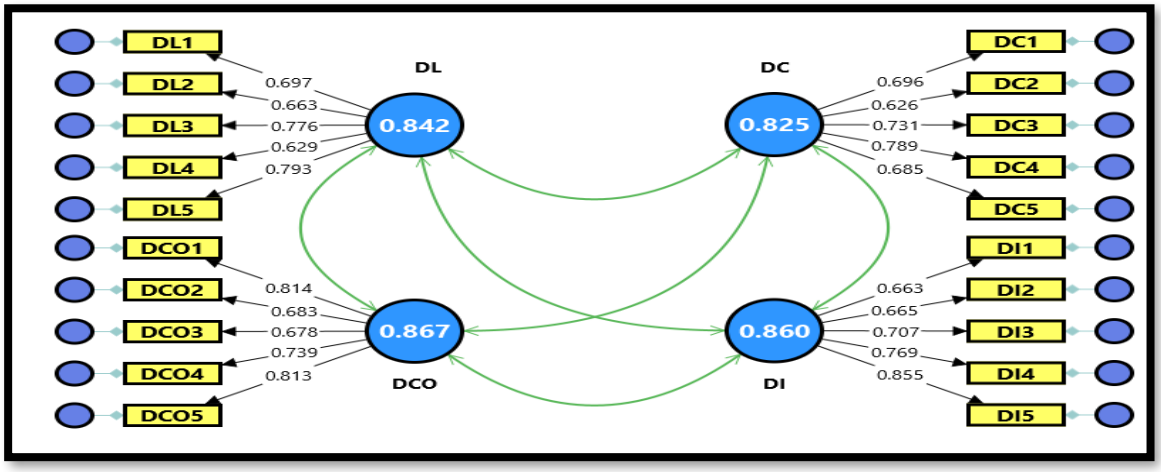

Figure (1): Confirmatory Factor Analysis of the Digital Leadership Variable

SmartPLS 4 software

2. Confirmatory Factor Analysis of the Digital Transformation Variable

Figure (2) shows the results of the confirmatory factor analysis of the Digital Transformation scale. This variable consists of four main dimensions: digital skills development, human requirements, technological infrastructure, and digital culture, comprising 20 items. Table (2) shows that all goodness-of-fit indicators fall within acceptable standard thresholds, reflecting the suitability of the proposed model for the study data and confirming the validity of the scale's factor structure. The results indicate that both standardized and unstandardized Cronbach's alpha values for all dimensions exceeded 0.70, demonstrating a high level of internal consistency. Furthermore, the composite reliability values were higher than the acceptable threshold, which enhances the reliability of the scale.

The Average Variance Extracted (AVE) values exceeded 0.50, indicating convergent validity and the ability of the dimensions to adequately explain the variance in their items. Accordingly, these results reflect the strong quality of the

Digital Transformation construct and its suitability for testing structural model relationships.

It is evident that all items of the Digital Transformation variable achieved statistical significance, with estimated values ranging from 0.561 to 0.855. The calculated t-values ranged between 4.360 and 7.450, which is higher than the tabulated value of 1.984 at a significance level of 0.05. Meanwhile, the p-values were less than 0.05, indicating the statistical significance of the path coefficients and confirming that the items demonstrate construct validity within the model.

Table (2): Quality Assessment of the Digital Transformation Variable

Average variance Extract (AVE)	Compound stability (rho_c)	Cronbach's Alpha is not Standardization	Alpha Cronbach Standardization	Dimensions of the transformation variable digital
0.526	0.846	0.842	0.844	DCU
0.593	0.882	0.880	0.880	DT
0.558	0.866	0.854	0.856	HR
0.616	0.890	0.890	0.890	TI
0.5 ≤	0.70≤	0.70≤	0.70≤	Standard

Source: Outputs of the (Smart Pls4) program.

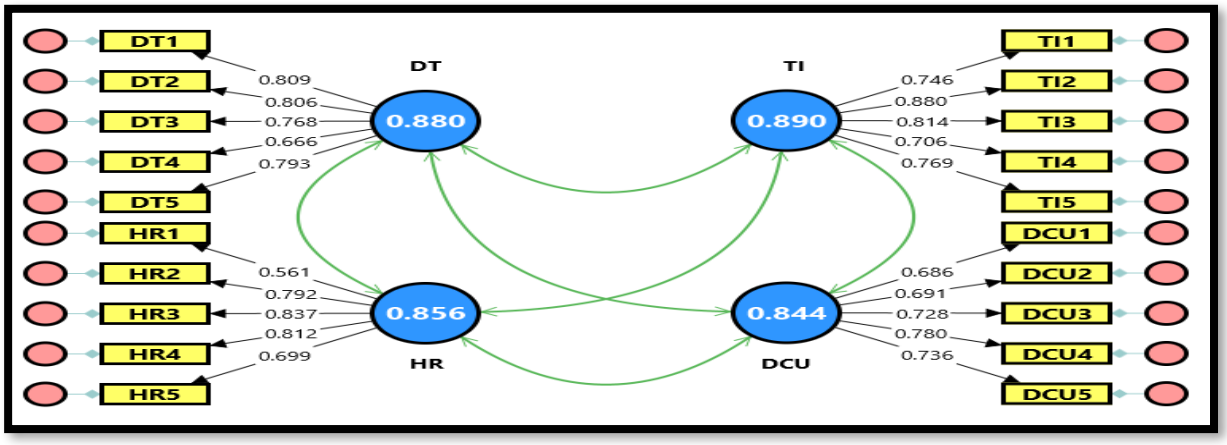

Figure (2): Confirmatory Factor Analysis of the Digital Transformation Variable

Source: Outputs of the SmartPLS 4 program.

3. Confirmatory Factor Analysis of the Administrative Decision Variable

Figure (3) shows the results of the confirmatory factor analysis of the Administrative Decision scale. This variable consists of two main dimensions: administrative decision efficiency and administrative decision effectiveness, comprising 10 items.

Table (3) shows that all goodness-of-fit indicators fall within acceptable standard thresholds. This reflects the suitability of the proposed model for the study data and confirms the validity of the scale's factor structure.

The results indicate that both standardized and unstandardized Cronbach's alpha values for both dimensions exceeded 0.70, demonstrating a high level of internal consistency. Furthermore, the composite reliability values were higher than the minimum acceptable threshold, which enhances the reliability of the measurement.

The Average Variance Extracted (AVE) values exceeded 0.50, indicating convergent validity and the ability of the dimensions to adequately explain the variance in their items. Accordingly, these results reflect the strong quality of the Administrative Decision construct and its suitability for testing structural model relationships.

It is evident that all items of the Administrative Decision variable achieved statistical significance, as the estimated values ranged between 0.597 and 0.876. The calculated t-values ranged between 4.744 and 7.117, which is higher than the tabulated value of 1.984 at a significance level of 0.05. Meanwhile, the p-values were less than 0.05, indicating the statistical significance of the path coefficients and confirming that the items demonstrate construct validity within the model.

Table (3): Evaluation of the quality of the Administrative Decision variable

Average variance Extract (AVE)	Compound stability (rho_c)	Cronbach's Alpha is not Standardization	Alpha Cronbach Standardization	Dimensions of the decision variable Administrator
0.657	0.902	0.902	0.904	AD

0.592	0.975	0.828	0.828	ADE
0.5 ≤	0.70≤	0.70≤	0.70≤	Standard

Source: Outputs of the (Smart Pls4) program.

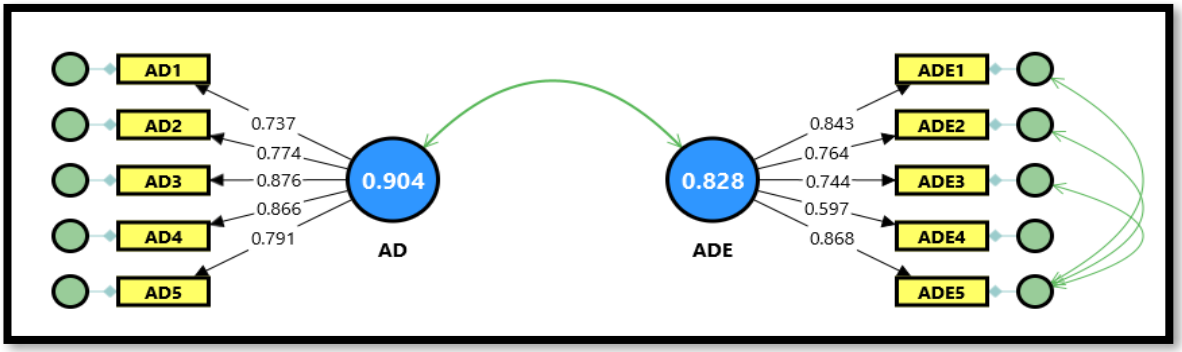

Figure (3): Confirmatory Factor Analysis of the Administrative Decision Variable

Source: Outputs of the SmartPLS 4 program.

Second: Descriptive Analysis of the Research Variables

1. Digital Leadership Variable

The results in Table (4) show that the Digital Leadership variable had an overall mean of (3.773), a standard deviation of (0.722), a coefficient of variation of (19.14), and a relative importance of (75.46%), indicating a positive response. It ranked first among the study variables, reflecting the adoption of digital leadership practices by the sample of middle management at the College of Administration and Economics, University of Wasit. These practices contribute to improving administrative work and enhancing the quality of decision-making.

At the dimension level, the Digital Insight dimension ranked first, with a mean of (3.838), a standard deviation of (0.780), a coefficient of variation of (20.31), and a relative importance of (76.76%), indicating a positive response. This suggests management interest in anticipating digital transformations and aligning academic and administrative work with future requirements.

The Digital Competence dimension followed in second place, with a mean of (3.791), a standard deviation of (0.776), a coefficient of variation of (20.47), and

a relative importance of (75.82%), reflecting employees' possession of digital skills that support job performance.

As for Digital Citizenship, it ranked last with a mean of (3.729), a standard deviation of (0.835), a coefficient of variation of (22.39), and a relative importance of (74.59%), indicating a positive response. This reflects the need to further enhance awareness of digital behavior and promote a culture of responsible use of digital technologies within the university environment.

2. Digital Transformation Variable

Table (4) shows that the Digital Transformation variable had an overall mean of (3.690), a standard deviation of (0.763), a coefficient of variation of (20.67), and a relative importance of (73.81%), indicating a positive trend. It ranked second among the study variables, reflecting the adoption of digital transformation practices by middle management at the College of Administration and Economics, University of Wasit, and their contribution to improving administrative performance.

At the dimension level, the Digital Culture dimension ranked first, with a mean of (3.779), a standard deviation of (0.814), a coefficient of variation of (21.54), and a relative importance of (75.59%), indicating a positive trend.

It was followed by the Human Resources dimension in second place, with a mean of (3.753), a standard deviation of (0.810), a coefficient of variation of (21.60), and a relative importance of (75.06%), also indicating a positive trend.

The Technological Infrastructure dimension ranked third, with a mean of (3.694), a standard deviation of (0.831), a coefficient of variation of (22.50), and a relative importance of (73.88%), indicating a positive trend.

Finally, Digital Skills Development ranked last, with a mean of (3.535), a standard deviation of (0.859), a coefficient of variation of (24.31), and a relative importance of (70.71%), also indicating a positive trend. This highlights a clear need to strengthen digital training and development programs to enhance employee efficiency and improve readiness for digital transformation.

3. Administrative Decision Variable

Table (4) shows that the Administrative Decision variable had an overall mean of (3.524), a standard deviation of (0.673), a coefficient of variation of (19.10), and a relative importance of (70.47%), indicating a positive response. It ranked third among the study variables, reflecting an acceptable level of efficiency and effectiveness in decision-making, according to the responses of middle management at the College of Administration and Economics, University of Wasit.

At the dimension level, Administrative Decision Effectiveness ranked first, with a mean of (3.562), a standard deviation of (0.672), a coefficient of variation of (18.87), and a relative importance of (71.24%), indicating a positive response. This suggests the administration's ability to achieve objectives and make appropriate decisions in a timely manner.

Administrative Decision Efficiency followed in second place, with a mean of (3.485), a standard deviation of (0.861), a coefficient of variation of (24.69), and a relative importance of (69.71%), indicating a positive response. However, this reflects room for improvement in resource utilization and procedural simplification in decision-making processes, which requires strengthening practices that enhance administrative decision efficiency within the university environment.

Table (4): Descriptive Indicators of the Research Variables

direction Answer	Dimensional arrangement and variables	Importance Relativity	coefficient Difference	deviation Standard	Middle Calculation	Dimensions of research variables
good	2	75.82	20.47	0.776	3.791	Digital proficiency
good	4	74.59	22.39	0.835	3.729	Digital citizenship
good	1	76.76	20.31	0.780	3.838	Digital insight
good	3	74.65	22.04	0.823	3.732	Digital strategy

good	the first	75.46	19.14	0.722	3.773	Digital leadership
good	2	75.06	21.60	0.810	3.753	Human requirements
good	3	73.88	22.50	0.831	3.694	Technology infrastructure
good	1	75.59	21.54	0.814	3.779	Digital culture
good	4	70.71	24.31	0.859	3.535	Developing digital skills
good	the second	73.81	20.67	0.763	3.690	Digital transformation
good	2	69.71	24.69	0.861	3.485	Efficiency of administrative decision
good	1	71.24	18.87	0.672	3.562	Effectiveness of administrative decisions
good	the third	70.47	19.10	0.673	3.524	Administrative decision

Source: SPSS V.28

Third: Testing the Research Hypotheses

1. Testing the Direct Effect Hypotheses

A. The first main research hypothesis, which states that there is a statistically significant effect between digital leadership and administrative decision-making, is tested based on the results presented in Table (5).

The calculated F-value for the effect of digital leadership on administrative decision-making reached (65.905), which is higher than the tabulated F-value of (3.94) at a significance level of (0.05). This indicates the statistical significance of the regression model and confirms its validity in explaining the relationship between the two variables.

The correlation coefficient (R) of (0.707) indicates a strong positive relationship between digital leadership and administrative decision-making. This reflects that digital leadership practices contribute to supporting the orientations of middle management at the College of Administration and Economics, University of Wasit, toward improving administrative decision-making.

The coefficient of determination (R^2) reached (0.500), while the adjusted R^2 value reached (0.492). This means that digital leadership explains 50% of the variance in administrative decision-making, while the remaining percentage is attributed to other variables not included in the model.

The calculated t-value for the regression coefficient (β) was (8.118), which is higher than the tabulated value (1.984) at a significance level of (0.05), with a significance level of (0.000). This confirms the significance of the direct effect of digital leadership on administrative decision-making.

The standardized regression coefficient (β) of (0.659) indicates that a one-unit increase in digital leadership leads to an increase of 65.9% in administrative decision-making.

Based on these results, the alternative hypothesis is accepted, which states that there is a statistically significant effect of digital leadership on administrative decision-making.

Table (5): Statistical Indicators of the Impact of Digital Leadership on Administrative Decision-Making

decision	Sig	(F)	Adj R2	($R^{2)}$	(R)	(t)	Digital leadership		variable Approved
acceptance Hypothesis The alternative	0,000	65.905	0.492	0.500	0.707	3.334	1.039	(α)	Administrative decision
						8.118	0.659	(β)	
Value (F) Tabular value = 3.94 / Tabular value of (t) = 1,948 / N = 68									

Source: SPSS V.28

Testing the Research Hypothesis (Second Main Hypothesis)

The second main research hypothesis, which states that there is a statistically significant effect between digital transformation and administrative decision-making, is tested based on the results presented in Table (6).

The results show that the calculated F-value for the effect of digital transformation on administrative decision-making reached (118.447), which is higher than the tabulated F-value of (3.94) at a significance level of (0.05). This indicates the statistical significance of the regression model and confirms its validity in explaining the relationship between the two variables.

The correlation coefficient (R) of (0.801) indicates a strong positive relationship between digital transformation and administrative decision-making. This reflects that the adoption of digital transformation practices contributes to supporting the orientations of middle management at the College of Administration and Economics, University of Wasit, toward improving the level of administrative decision-making.

The coefficient of determination (R^2) reached (0.642), while the adjusted R^2 value was (0.637). This means that digital transformation explains 64.2% of the variance in administrative decision-making, while the remaining percentage is attributed to other variables not included in the model.

The calculated t-value for the regression coefficient (β) was (10.883), which is higher than the tabulated value (1.984) at a significance level of (0.05), with a p-value of (0.000). This confirms the statistical significance of the direct effect of digital transformation on administrative decision-making.

The standardized regression coefficient (β) of (0.707) indicates that a one-unit improvement in digital transformation leads to an increase of 70.7% in administrative decision-making.

Based on these results, the alternative hypothesis is accepted, which states that there is a statistically significant effect of digital transformation on administrative decision-making.

Table (6): Statistical Indicators of the Impact of Digital Transformation on Administrative Decision-Making

decision	Sig	(F)	Adj (R2)	(R2)	(R)	(t)	Digital transformation		variable Approved
acceptance Hypothesis The alternative	0.000	118,447	0.637	0.642	0.801	3.739	0.915	(α)	Administrative decision
						10.883	0.707	(β)	
Value (F) Tabular value = 3.94 / Tabular value of (t) = 1,948 / N = 68									

Source: SPSS V.28

Testing the Research Hypothesis (Third Main Hypothesis)

The third main research hypothesis, which states that there is a statistically significant effect between digital leadership and digital transformation, is tested based on the results presented in Table (7). The results of Table (7) show that the calculated F-value for the effect of digital leadership on digital transformation reached (175.959), which is higher than the tabulated F-value of (3.94) at a significance level of (0.05). This indicates the statistical significance of the regression model and confirms its validity in explaining the relationship between the two variables. The correlation coefficient (R) of (0.853) indicates a strong positive relationship between digital leadership and digital transformation. This reflects that the adoption of digital leadership practices significantly contributes to enhancing the orientations of middle management at the College of Administration and Economics, University of Wasit, toward the application of digital transformation.

The coefficient of determination (R^2) reached (0.727), while the adjusted R^2 value was (0.723). This means that digital leadership explains 72.7% of the variance in the digital transformation variable, while the remaining percentage is

attributed to other variables not included in the model. The calculated t-value for the regression coefficient (β) was (13.265), which is higher than the tabulated value (1.984) at a significance level of (0.05), with a p-value of (0.000). This confirms the statistical significance of the direct effect of digital leadership on digital transformation. The standardized regression coefficient (β) of (0.901) indicates that a one-unit improvement in digital leadership leads to an increase of 90.1% in digital transformation. Based on these results, the alternative hypothesis is accepted, which states that there is a statistically significant effect of digital leadership on digital transformation.

Table (7): Statistical Indicators of the Impact of Digital Leadership on Digital Transformation

decision	Sig	(F)	Adj (R^2)	(R^2)	(R)	(t)	Digital leadership		mediating variable
acceptance Hypothesis The alternative	0.000	175.959	0.723	0.727	0.853	1.119	0.292	(α)	Digital transformation
						13.265	0.901	(β)	
value (F) = 3,94 / Tabulated value (t) = 1,94 / N = 68									

Revised version (corrected):

Source: SPSS V.28

2. Testing the mediator hypotheses:

Testing the fourth main research hypothesis, which states that: (There is a significant impact between digital leadership and administrative decision-making through the mediating role of digital transformation). It is clear from Table (8), Figures (4) and (5) that the calculated value of (t) for the effect between digital leadership and digital transformation was (13.265), which is greater than the tabulated value of (1.984) at a significance level of (0.05). This indicates the existence of a statistically significant effect and reflects that practices

related to digital competence, digital citizenship, digital insight, and digital strategy contribute to enhancing the orientation of middle management in the College of Administration and Economics at Wasit University towards adopting digital transformation and consolidating its practices within the organizational environment.

The calculated value of (t) for the effect between digital transformation and administrative decision-making was (10.883), which is greater than the tabulated value of (1.984), and at a significance level of (0.000), indicating a statistically significant effect. This shows that human requirements, technological infrastructure, digital culture, and digital skill development are key pillars in supporting the effectiveness of administrative decision-making and enhancing its efficiency.

From the previous results, it is clear that the mediating variable, digital transformation, plays a crucial role in strengthening the relationship between digital leadership and administrative decision-making. The results showed that the value of the indirect effect between digital leadership and administrative decision-making reached (0.621), which is greater than the value of the direct effect (0.080). This indicates that the mediating variable represents full mediation, which was confirmed by the value of (t) for the direct effect, which reached (0.617) with a significance level of (0.537), which is higher than the critical value of (1.984). This indicates the insignificance of the direct effect when the mediating variable is included in the model.

This result indicates that improving administrative decision-making within the college depends to a greater extent on the level of digital transformation, which translates digital leadership practices into practical applications, thereby enhancing the work environment that supports innovation and experimentation and increases the efficiency and effectiveness of administrative decisions.

Table (8): Direct and indirect impact between digital leadership and administrative decision-making through the mediating role of digital transformation

type Mediation	Decision to influence Live	P	T	impact direct	non-effect direct	Search variables		
mediation Complete	Function	0.000	13.365	0.901	---	Digital leadership	--->	Digital transformation
	Non-functional	5370	0.617	0.080	0.621	Digital leadership	--->	Administrative decision
	Function	0.000	5.217	0.642	---	Digital transformation	--->	Administrative decision

SMART PLS 4 program

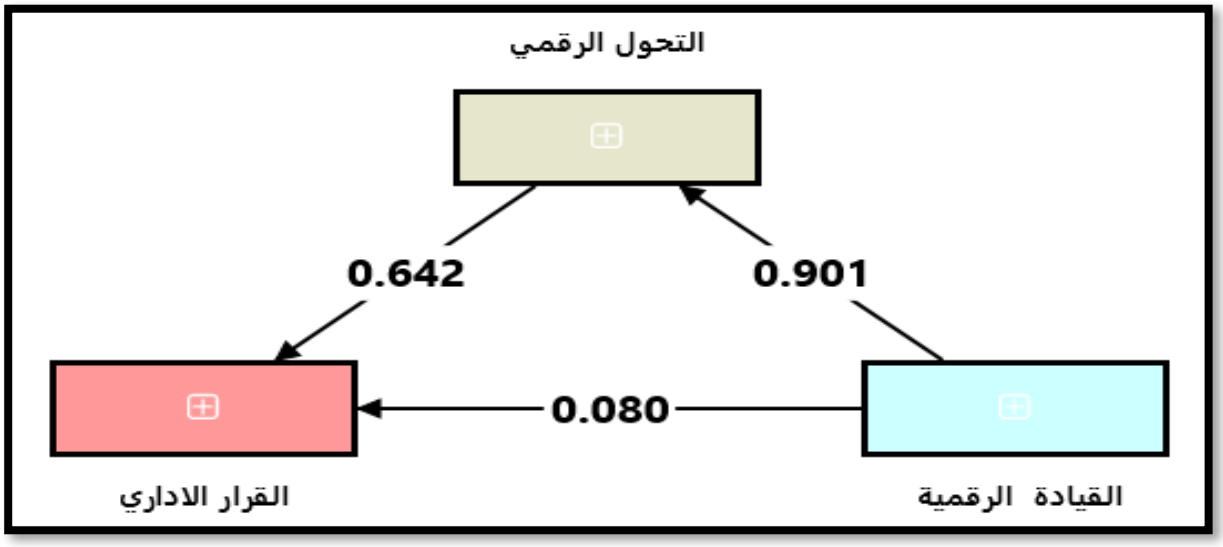

Figure (4) shows the values of the effect of digital leadership on administrative decision-making through the mediating role of digital transformation.

Source: Outputs of the Smart PLS 4 program.

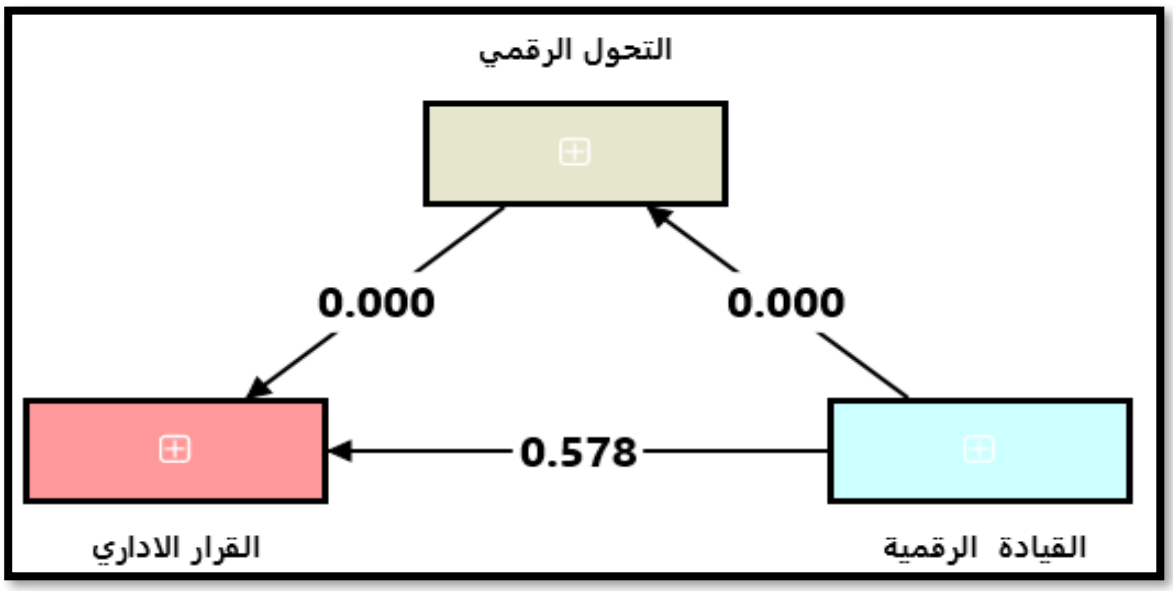

Figure (5) Values of the indirect effect between digital leadership and administrative decision-making through the mediating role of digital transformation.

Source: Smart PLS 4 program outputs.

To verify the effect of the mediating variable, digital transformation, on the relationship between digital leadership and administrative decision-making, the Sobel test was used, as shown in Figure (6). The results showed that the p-value was less than the significance level (0.05), and the Sobel test value was (4.8598), which is greater than the critical value (1.984). This confirms the existence of a statistically significant mediating effect and reflects that digital transformation plays a fundamental role in strengthening the relationship between digital leadership and administrative decision-making by transforming digital leadership practices into organizational applications that contribute to improving the efficiency and effectiveness of decision-making.

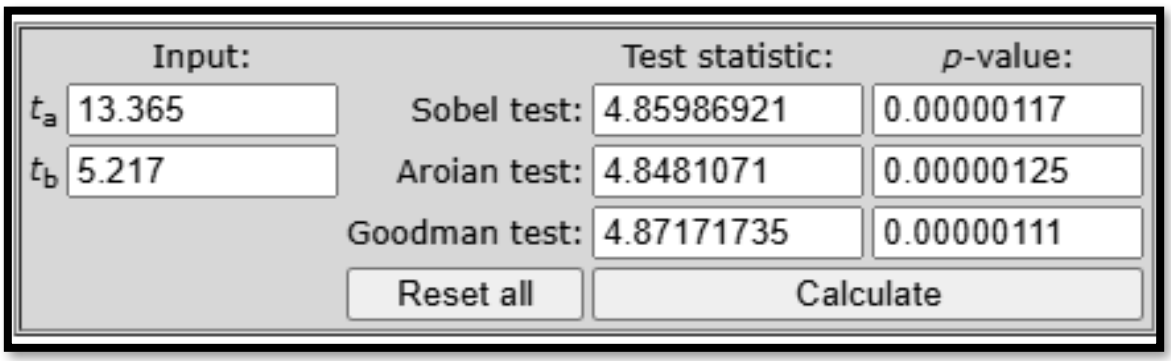

Figure (6) Sobel's test based on t-test values

First: Conclusions

Digital leadership is achieving a good level and ranking first, which reflects that middle management in the College of Administration and Economics at Wasit University has a clear orientation towards employing digital technologies in developing administrative work and enhancing performance quality. There is a gap between digital leadership and the level of administrative decision-making, indicating that available digital capabilities have not been adequately translated into more efficient and effective administrative decisions.

Digital insight is higher than digital citizenship, reflecting the administration's ability to anticipate future transformations, alongside a clear need to enhance organized digital behaviors within the university environment. Digital transformation is at a good level but remains in a transitional phase, indicating that the college has not yet reached full digital maturity despite a clear trend toward development. Digital culture is stronger than digital skills development, which reflects the spread of digital awareness without sufficient practical skills among staff.

Technological infrastructure is adequately available, but it is not optimally utilized to generate added organizational value. The effectiveness of administrative decisions is higher than their efficiency, indicating that decisions achieve their goals but consume more resources or time than required. The level of digital leadership directly influences the promotion of digital transformation, reflecting that the adoption of digital practices by middle management at the College of

Administration and Economics at Wasit University contributes to accelerating the adoption of modern systems and applications within the university environment.

Digital transformation contributes to improving administrative decision-making, as the availability of human resources, technological infrastructure, digital culture, and skills development forms a fundamental basis for enhancing the efficiency and effectiveness of decisions within the college.

There is no clear direct effect of digital leadership on administrative decision-making when digital transformation is included, indicating that digital leadership capabilities translate into tangible results only through a supportive digital environment.

Digital transformation represents the essential link that transmits the effect of digital leadership to administrative decision-making, confirming that decision effectiveness depends more on the level of maturity of digital transformation within the college.

Second: Recommendations

1. The need to enhance integration between digital leadership and administrative decision-making efficiency to ensure that digital capabilities are transformed into practical decisions that support institutional performance.
2. Continuously developing digital skills training programs with a focus on practical application to enhance employees' ability to use technologies efficiently.
3. Adopting data-driven decision support systems to increase decision accuracy and reduce reliance on individual judgment.
4. Improving investment in technological infrastructure and aligning it with actual organizational needs to achieve maximum institutional benefit.
5. Working to achieve a balance between the efficiency and effectiveness of administrative decisions by rationalizing resource use and reducing time and effort.

6. Enhancing the digital innovation environment by encouraging initiatives and adopting technology-based ideas.
7. Adopting a comprehensive digital transformation strategy based on the integration of digital leadership, organizational culture, and administrative decision-making efficiency to ensure sustainable institutional development.
8. Directing digital leadership practices toward supporting digital transformation in practice by linking leadership vision with technological applications within the college.

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