

## Measuring the impact of digital transformation in tax administration on the quality of tax services: A field study in Eastern Algeria

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**Abstract---Purpose:** This study aims to assess the impact of digital transformation within tax administration on the quality of tax services provided by tax offices in Eastern Algeria. **Importance/Value:** The research underscores the significance of digitalizing tax processes as a means to improve the efficiency and effectiveness of tax administration, contributing to enhanced taxpayer experience and service delivery. **Methodology/Approach:** The study uses a descriptive-analytical approach with a field study conducted on a sample representing 97.30% of tax agents in Eastern Algeria. Several hypotheses were tested to explore the nature of the relationship between digital transformation and the quality of tax services. **Findings:** The results indicate a growing trend toward digitization in Eastern Algeria's tax administrations. A statistically significant and positive correlation was found between digital transformation and improvements in the quality of tax services. The findings demonstrate that digitization enhances operational performance, transparency, and efficiency in service delivery. **Conclusion:** The study concludes that digital transformation plays a crucial role in improving the quality of tax services in Eastern Algeria, driving greater efficiency and accuracy in service delivery. **Recommendations:** The study recommends strategic investments in the digital infrastructure of tax administrations, continuous training programs for tax agents, and the development of integrated electronic platforms for

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improved communication and service delivery. Additionally, strengthening interoperability between digital systems and establishing evaluation mechanisms to assess the effectiveness of digital transformation are crucial for sustained improvements.

**Keywords---**digital transformation; tax administration; service quality; tax services; Eastern Algeria.

## 1. Introduction :

With the rapid advancement of digital technologies, the transition towards digital management has become an essential necessity for adapting to the profound changes taking place in both the business environment and the public sector. The use of advanced technologies such as artificial intelligence, blockchain, and big data analytics has brought about a fundamental shift in service delivery methods, which has positively impacted operational efficiency, enhanced transparency, and minimized administrative costs. Digital management extends far beyond the mere digitization of processes; it involves the strategic redesign of administrative operations, ensuring flexibility and the rapid responsiveness required to meet user demands. This approach is a crucial element in improving institutional performance and maintaining competitiveness in a fast-evolving global landscape.

In the specific context of tax administration, the digital transformation represents a paradigm shift aimed at improving the quality of tax services and enhancing taxpayer compliance. As economic transactions become more complex and cross-border activities increase, the need for digital systems capable of effectively processing tax data, reducing evasion opportunities, and simplifying the declaration and payment procedures has become indispensable. The goal of digitalizing tax administration is not only to expedite transactions but also to foster greater transparency and accuracy, thus increasing taxpayer trust and confidence.

The growing reliance on digital systems in tax administration plays a critical role in simplifying tax-related processes, reducing bureaucratic hurdles, and enabling a more efficient allocation of resources. Consequently, this study seeks to address the following research question: To what extent does the digital transformation of tax administration impact the quality of tax services provided by tax authorities in Eastern Algeria? In order to answer this question, the study will explore the impact of digital transformation on tax performance efficiency and assess its ability to strike a balance between streamlining tax procedures and enhancing financial oversight.

## Hypotheses

Based on the research question, the study seeks to test a set of hypotheses reflecting the relationship between the digital transformation of tax administration and the quality of tax services, as follows:

- 1) **Hypothesis 1:** There are statistically significant indicators of the adoption of digital transformation in tax administrations in Eastern Algeria at a significance level ( $\alpha \leq 0.05$ );
- 2) **Hypothesis 2:** There are statistically significant indicators of a positive relationship between the digital transformation of tax administration and the quality of tax services in Eastern Algeria at a significance level ( $\alpha \leq 0.05$ );
- 3) **Hypothesis 3:** There is a statistically significant positive impact of digital transformation on the quality of tax services in tax administrations in Eastern Algeria at a significance level ( $\alpha \leq 0.05$ ).

## Study Objectives

This study aims to achieve several key objectives that contribute to understanding and analyzing the impact of digital transformation on tax performance, including:

- 1) Exploring the features of digital transformation in tax administration, focusing on the most important technologies and systems adopted;

- 2) Analyzing the quality of tax services and the extent to which they are influenced by digital transformation in terms of efficiency, transparency, and accessibility;
- 3) Evaluating Algeria's efforts to digitize its tax administration through a study of the policies and strategies implemented in this area;
- 4) Identifying the nature of the relationship between digital transformation and the quality of tax services, highlighting the extent to which digital transformation contributes to achieving higher tax efficiency.

### **Study Methodology**

This study relies on a scientific approach that combines both descriptive and analytical methodologies, as follows:

**Descriptive Approach:** Used to provide the theoretical framework for the study by reviewing concepts related to digital transformation, tax administration, and the quality of tax services .**Analytical Approach:** Applied to analyze the results of the field study, where data related to the digital transformation of tax administration in Eastern Algeria's tax authorities will be studied and analyzed to test the hypotheses and reach accurate scientific conclusions.

## **2. Conceptual Framework**

Digital transformation has become an urgent necessity across various sectors, playing a crucial role in enhancing performance and improving the quality of services provided. In the tax sector, digital transformation facilitates the simplification of procedures, increases efficiency, enhances transparency, and more, all contributing to the improvement of tax services. This section will address the theoretical aspects of the variables under study.

### **2.1. The Concept of Digital Transformation**

Digital transformation has emerged as a key strategic pillar, with countries and organizations racing to adopt it, driven by rapid technological advancements and their profound impacts on various sectors. Due to its significant importance, digital transformation has been approached from multiple angles, which can be summarized as follows:

#### **2.1.1. Definition of Digital Transformation**

Digital transformation is defined as the process of integrating digital technologies into all aspects of daily life and societal activities, including organizational and economic domains, with a particular focus on restructuring business models to align with the demands of the modern digital environment (Hannah, 2020, p. 05). It is also viewed as the increasing adoption of information and communication technologies in economic operations, encompassing modern concepts such as the Internet of Things (IoT), artificial intelligence (AI), and big data analytics (Janine & Al, 2018, p. 129).

Digital transformation relies on three key components, as outlined below: (Daniel & Christopher, 2018, p. 03)

- 1) Creating added value and generating new business opportunities: through the reshaping of institutional structures and activities;
- 2) Improving the customer experience: by providing innovative digital solutions that meet customer needs efficiently and flexibly;
- 3) Empowering institutions by building strong digital capabilities: fostering the development of a dynamic and sustainable business environment.

Based on these definitions, digital transformation can be considered a comprehensive process of change that requires organizations to keep pace with technological developments, not only to enhance their

competitiveness but also to ensure their sustainability by offering services that align with customer expectations and the demands of the digital market.

### **2.1.2. Drivers of Digital Transformation**

Digital transformation has emerged as a response to a set of challenges faced by traditional institutions, necessitating the adoption of modern technologies to ensure continuity and enhance efficiency. Key drivers for embracing digital transformation include the following: (Dima & Mustafa, 2019, p. 54)

- 1) Complexity of traditional processes, leading to increased operational costs and administrative burdens;
- 2) Lack of integration in data flows across different departments, limiting the efficiency of decision-making;
- 3) Need to enhance competitiveness in a business environment dependent on innovation and technology;
- 4) Evolving customer demands, compelling institutions to adopt digital strategies to provide more interactive and flexible services;
- 5) Growing reliance on digital technologies as the foundation for reengineering processes and achieving sustainable institutional transformation.

### **2.1.3. Tools of Digital Transformation**

The digital transformation process relies on a set of technological tools that form the infrastructure for this transformation, which can be categorized into the following groups: (Naser, 2014, p. 03)

- 1) Digital Devices: Including computers, servers, and smart devices used in executing digital operations;
- 2) Software and Applications: Divided into operating systems such as Windows and Linux, enterprise resource planning (ERP) systems, AI applications, and cloud computing platforms;
- 3) Communication Networks: Encompassing the digital infrastructure for data transmission, such as the internet, intranet, extranet, as well as high-speed communication technologies (5G) that enhance the efficiency of digital operations;
- 4) Knowledge Capital: Represented by human competencies responsible for developing, operating, and managing digital systems, including data analysts, software engineers, and cybersecurity specialists.

## **2.2. The Quality of Tax Services**

This section explores the concept of tax service quality, its key evaluation criteria, and how it is measured in the public sector. It also examines Algeria's digital transformation efforts within the tax administration, highlighting major initiatives aimed at improving service efficiency and taxpayer satisfaction.

### **2.2.1. Concept of Tax Service Quality**

Service quality is commonly defined as the degree of excellence or superiority, which can be perceived either objectively or subjectively. In the tax context, improving the quality of services delivered to taxpayers—whether individuals or legal entities—by tax authorities and governments has become a critical factor in strengthening tax compliance and enhancing the efficiency of revenue collection (Adekoya & Al, 2020, p. 65).

Accordingly, tax service quality can be understood as the extent to which tax administration services are delivered efficiently and effectively, in a way that reflects taxpayers' satisfaction with administrative performance and their willingness to engage with these services.

### **2.2.2. Criteria for Measuring the Quality of Tax Services**

The quality of public services in general—and tax services in particular—is typically assessed using a set of fundamental criteria, including: (Kaddouj & Al, 2023, p. 237)

- 1) Reliability: The extent to which the tax administration consistently delivers accurate and dependable services in line with its commitments.
- 2) Responsiveness: The ability of tax officers to promptly and effectively respond to taxpayers' inquiries and requests, offering appropriate support.
- 3) Assurance: The level of trust and security taxpayers experience when dealing with the tax administration.
- 4) Empathy: The degree of personalized attention and understanding demonstrated by tax officials toward taxpayers' needs and concerns.
- 5) Tangibles: The physical elements of service delivery, such as infrastructure, equipment, facilities, and the quality of communication tools used in the interaction.

### **2.3. Digital Transformation of the Tax Administration in Algeria**

Like many advanced Arab and European countries, Algeria has made significant strides in the digital transformation of its tax administration. These efforts have primarily focused on improving service delivery to taxpayers, given its direct impact on enhancing tax compliance. Key initiatives include:

- 1) Tax Administration Website: The General Directorate of Taxes (DGI) launched a dedicated electronic portal <https://www.mfdgi.gov.dz> to offer various online services to taxpayers (Bouzekri, 2021, p. 462).
- 2) Electronic Tax Identification Number (TIN): As part of the administrative modernization strategy, Algeria implemented an e-TIN system on May 8, 2016, enabling taxpayers to obtain their TIN remotely via the official platform <https://nifenligne.mfdgi.gov.dz> (Bouzekri, 2021, p. 462).
- 3) Digital Tax Services Portal: This portal provides access to comprehensive tax-related information, including fiscal laws, legislation, official publications, and a communication space for taxpayer inquiries (Ramadli & Goudri, 2020, p. 437).
- 4) Service Reference Framework: Established on June 7, 2004, under General Directive No. 01, this framework outlines performance standards for tax officers, aiming to improve service quality and foster a more transparent and efficient relationship with taxpayers across all communication channels (Ben Chahra & Ghoumane, 2020, p. 266).
- 5) -“Jibayatic” E-Filing Platform: Initially implemented for large enterprise directorates (DGE), this platform facilitates electronic filing and payment of taxes through a user-friendly interface. It has since been expanded to cover all taxpayer categories and provides access to the full range of Algerian tax documentation. (Toumi & Benamara, 2019, p. 247)
- 6) -“Moussahamatak” E-Service Portal: Designed to support taxpayers in remote or underserved areas, this platform enables the submission of tax returns and electronic payments. It is gradually being extended to tax offices across the country. (Meftah, 2022, p. 173)

### **2.4. The Relationship Between Digital Transformation and Tax Service Quality**

Digital transformation plays a pivotal role in enhancing the quality of tax services. It contributes to the simplification of procedures, boosts transparency, and raises taxpayer satisfaction. This relationship can be analyzed through the following dimensions: (Slimani, 2023, pp. 583, 584)

- 1) Improved Efficiency and Reliability: Automation and digital tools reduce human error and streamline operations, enhancing the reliability and precision of tax services.
- 2) Accelerated Service Delivery and Responsiveness: Platforms such as “Jibayatic” and “Moussahamatak” allow for real-time filing and payment, significantly reducing processing time and improving responsiveness to taxpayer needs.
- 3) Enhanced Security and Trust: Digital systems, such as e-TIN, offer secure identification and reduce the risk of fraud, thereby reinforcing taxpayer confidence in the integrity of services.

- 4) Strengthened Taxpayer Engagement Through Digital Empathy: Online platforms and inquiry services enable more accessible and responsive communication, reflecting a more empathetic and user-centered approach by the tax administration.
- 5) Improved Technological and Physical Service Environments: The integration of modern technologies has upgraded the operational infrastructure of tax services, improving both digital and physical touchpoints that contribute to a higher standard of service delivery.

### **3. The Fieldwork – Measuring the Impact of Digital Transformation of Tax Administration on the Quality of Tax Services in Eastern Algeria**

To assess the impact of the digital transformation of the tax administration on the quality of tax services, an empirical study was conducted on a selected group of tax officers operating in the eastern regions of Algeria. This study followed a structured methodological framework composed of several key stages and procedures, as detailed below:

#### **3.1. Methodological Procedures of the Study**

To ensure the precision and reliability of the field investigation, the study involved identifying the target population and determining the appropriate sample size, testing the validity of the research instrument, and analyzing the demographic characteristics of the respondents. These steps were carried out as follows:

##### **3.1.1. Preliminary Procedures**

Field studies typically begin with a series of preparatory steps, including the delineation of the study population, the selection of a representative sample, and the deployment of effective data collection instruments capable of producing objective and accurate results. These elements are addressed below:

##### **3.1.2. Study Population and Sample**

The study population consisted of tax officers from various tax departments in Eastern Algeria. A purposive sampling technique was employed, resulting in the distribution of 370 questionnaires. Of these, 364 valid responses were recovered and retained for analysis, yielding a high response rate of 97.30% of the total targeted sample.

##### **3.1.3. Data Collection Instrument**

A structured questionnaire served as the primary quantitative tool for data collection, designed to address the study's central research question and test its underlying hypotheses. The questionnaire was divided into two main sections:

- 1) Section One: Collected demographic and background information about the respondents;
- 2) Section Two: Focused on evaluating participants' perceptions regarding the study's key variables.

The questionnaire was carefully constructed based on a review of relevant prior research and aligned with the theoretical framework of the study. It underwent a rigorous content validation process, with expert reviewers ensuring the clarity, relevance, and neutrality of the items, minimizing the potential for bias or misinterpretation.

Subsequently, the collected data were analyzed using the statistical software packages SPSS and AMOS. These tools enabled the empirical testing of hypotheses and facilitated the derivation of reliable conclusions concerning the relationship between the digital transformation of the tax administration and the perceived quality of tax services.

#### **3.2. Validity of the Measurement Tool and Descriptive Analysis of Respondents' Answers**

This section presents the validity assessment of the measurement tool used in the study, ensuring that it accurately captures the intended constructs. It also provides a descriptive analysis of respondents'

answers, offering insights into their general perceptions and highlighting trends within the collected data.

### 3.2.1. Reliability of the Measurement Instrument (Cronbach's Alpha Coefficient)

To ensure the reliability and internal consistency of the measurement instrument used in this study, Cronbach's Alpha coefficient was calculated for each construct. The results are summarized in the following table:

**Table 1: Cronbach's Alpha Coefficient Values**

Construct	Number of Items	Cronbach's Alpha	Evaluation
Digital Transformation of the Tax Administration	15	0.824	Excellent
Quality of Tax Services	15	0.790	Good
Overall Instrument	30	0.808	Excellent

**Source:** Prepared by the researchers based on SPSS 26 outputs.

As indicated in Table 1, Cronbach's Alpha values for the constructs measuring the digital transformation of the tax administration (0.824) and the quality of tax services (0.790) both exceed the generally accepted threshold of 0.60, indicating a satisfactory level of internal consistency. These results confirm the reliability and robustness of the measurement instrument employed in the study.

### 3.2.2. Descriptive Profile of the Study Sample

Describing the demographic and professional characteristics of the study sample is a critical step in empirical research. It provides context for interpreting results and evaluating the representativeness of the sample relative to the broader population. The analysis covered key variables such as gender, age, educational level, and job category.

**Table 2: Descriptive Statistics of the Study Sample**

Variable	Category	Frequency	Percentage (%)
<b>Gender</b>	Male	226	62.1%
	Female	138	37.9%
<b>Job</b>	Technical Staff	211	58.0%
	Administrative Staff	153	42.0%
<b>Age</b>	21–30 years	64	17.6%
	31–40 years	133	36.5%
	41–50 years	112	30.8%
	Over 50 years	55	15.1%
<b>Educational</b>	Vocational Certificate	18	4.9%
	Bachelor's Degree	97	26.6%
	Master's Degree	168	46.2%
	Doctorate	81	22.3%

**Source:** Prepared by the researchers based on SPSS 26 outputs.

The results presented in Table 2 reveal that the majority of the respondents are male (62.1%), reflecting a gender imbalance in the tax administration workforce in Eastern Algeria. Regarding job category, 58.0% of participants are classified as technical staff, indicating a substantial focus on specialized operational roles within the administration.

The age distribution shows that the largest proportion of respondents (36.5%) are between 31 and 40 years old, suggesting a workforce with a moderate level of professional experience. Additionally, 30.8% of the sample falls within the 41–50 age group, indicating a healthy balance between mid-career and more experienced personnel.

In terms of education, the data demonstrate a high academic profile among respondents: 46.2% hold a Master's degree, and 22.3% possess a Doctorate. This reflects a highly educated workforce, which may contribute positively to the quality and efficiency of tax services provided by the administration.

### 3.3. Descriptive Analysis of Respondents' Answers and Hypothesis Testing

The descriptive analysis of the respondents' answers aims to provide a comprehensive overview of their perspectives and attitudes regarding the study topic through the application of appropriate statistical methods. Furthermore, the study hypotheses are tested to verify the expected relationships among variables, thereby contributing to drawing accurate scientific conclusions that support the research objectives.

#### 3.3.1. Descriptive Analysis of Respondents' Answers

This section focuses on analyzing the responses of the study sample concerning the research variables using descriptive statistical methods, specifically the arithmetic mean and standard deviation. The arithmetic mean reflects the general direction of the respondents' attitudes toward each item, whereas the standard deviation indicates the variability of their answers around the mean. Given that the questionnaire is based on a five-point Likert scale, the responses were categorized into the following intervals:

[1–1.80]: Strongly Disagree;

[1.80–2.60]: Disagree;

[2.60–3.40]: Somewhat Agree;

[3.40–4.20]: Agree;

[4.20–5]: Strongly Agree.

#### - Descriptive Analysis of the Digital Transformation of the Tax Administration

This section examines the responses of the study participants concerning the dimension of the digital transformation of the tax administration based on two statistical indicators: the arithmetic mean and standard deviation.

**Table 3: Descriptive Analysis of the Digital Transformation of the Tax Administration**

Item	Arithmetic Mean	Standard Deviation	Assessment
Digital transformation has facilitated access to tax services via electronic platforms.	4.31	0.67	Strongly Agree
It has accelerated tax procedures compared to traditional methods.	4.35	0.62	Strongly Agree
It has improved tax officers' efficiency by streamlining administrative operations.	3.95	0.71	Agree
Advanced digital tools ensure secure archiving and storage of tax data.	4.29	0.60	Strongly Agree
It has enhanced coordination between departments related to tax functions.	4.18	0.75	Agree
Digital solutions have reinforced data protection and taxpayer confidentiality.	4.23	0.66	Strongly Agree
It has reduced human errors and enhanced process accuracy.	3.89	0.78	Agree



Continuous digital training programs are available for tax officers.	4.02	0.79	Agree
Tax officers can electronically access taxpayer data, improving task efficiency.	3.93	0.91	Agree
Integration among digital systems within tax administrations has improved work effectiveness.	4.06	0.80	Agree
Operational costs have been reduced due to digital transformation.	3.92	0.86	Agree
Digital transformation has strengthened tax compliance and reduced evasion.	3.88	0.87	Agree
Quality of technical support for taxpayers has improved with round-the-clock availability.	4.04	0.62	Agree
New technologies have enabled easier access to online tax consultations.	4.30	0.68	Strongly Agree
Digital transformation has accelerated legal procedures related to tax collection.	4.24	0.74	Strongly Agree
<b>Digital Transformation Dimension (Overall)</b>	<b>4.16</b>	<b>0.63</b>	<b>Agree</b>

**Source:** Prepared by the researchers based on SPSS 26 outputs.

The results in Table 3 reveal that respondents evaluated the digital transformation of the tax administration positively, with arithmetic means ranging from [3.88–4.24], indicating a high level of satisfaction among tax officers regarding this transformation. The findings demonstrate that digital transformation has notably facilitated access to tax services via electronic platforms, enhancing both service efficiency and flexibility. Furthermore, it has accelerated tax procedures compared to traditional approaches, thereby improving the speed and effectiveness of operations.

Additionally, the results indicate that digital transformation has contributed to enhancing tax officers' performance by simplifying administrative processes, thus improving internal work efficiency. Significant improvements were also observed in data security and preservation, thanks to the implementation of advanced digital tools, which has increased trust in the digital system.

The findings also suggest better interdepartmental coordination, reflecting the effectiveness of collaborative work within the tax system. Moreover, digital solutions have significantly contributed to safeguarding taxpayer information confidentiality, highlighting the administration's commitment to privacy and data protection.

On another note, the results show that digital transformation has helped minimize human errors in tax operations, enhancing data accuracy and system reliability. Respondents also emphasized the importance of continuous training programs on new digital applications, which reflects the administration's efforts to enhance its workforce's capacity to handle modern technologies.

In terms of system integration, the results reveal a high degree of harmony between various digital components within the tax administration, which contributes to more efficient procedures and improved performance. Lastly, the digital transformation was found to reduce operational costs, enhance tax compliance, and limit tax evasion rates.

Based on these results, it can be concluded that the digital transformation of the tax administration has significantly improved the quality of tax services by boosting performance efficiency, reducing errors, and improving data accuracy. These outcomes underscore the importance of further investment in digital technologies to continue improving and modernizing tax services.

### - Descriptive Analysis of Respondents' Answers Regarding the Dimension of Tax Service Quality

This section aims to analyze the respondents' perceptions concerning the quality of tax services, based on descriptive statistical measures—specifically the arithmetic mean and standard deviation. The mean reflects the general trend of responses, while the standard deviation indicates the degree of variability among them.

**Table 4: Descriptive Analysis of the Tax Service Quality Dimension**

Statement	Mean	Standard Deviation	Evaluation
Tax services are aligned with taxpayers' needs and reflect their requirements.	4.22	0.76	Strongly Agree
Tax services are characterized by accuracy and speed, enhancing overall efficiency.	3.88	0.82	Agree
Electronic tax services have eliminated time and geographic barriers for taxpayers.	4.04	0.78	Agree
Electronic tax services are based on clear and simplified procedures, facilitating use.	3.96	0.79	Agree
Electronic tax services are available 24/7.	4.08	0.82	Agree
Digital transformation enables tax officers to perform tasks from any location at any time.	4.24	0.64	Strongly Agree
Tax service delivery has become easier and more flexible compared to traditional methods.	4.02	0.76	Agree
Digital transformation has enhanced interdepartmental coordination and accelerated data flow.	3.92	0.84	Agree
Digital transformation allows taxpayers to register electronically without face-to-face contact.	3.88	0.68	Agree
Electronic tax audits have improved taxpayer monitoring and contributed to reducing evasion.	4.10	0.76	Agree
E-filing enables the tax administration to track taxpayer status more accurately.	4.00	0.62	Agree
The service quality reference system ensures the provision of high-standard tax services.	4.08	0.72	Agree
<b>Dimension Two: Quality of Tax Services</b>	<b>4.04</b>	<b>0.66</b>	<b>Agree</b>

**Source:** Prepared by the researchers based on SPSS 26 outputs.

The results presented in Table 4 indicate that respondents evaluated the quality of digital tax services positively and to a high degree. The arithmetic means for the items ranged between [3.88–4.24], falling within the “Agree” to “Strongly Agree” categories on the five-point Likert scale. This reflects a high level of satisfaction among tax officers regarding the quality of these services. The findings suggest that digital transformation has contributed significantly to improving efficiency and flexibility by enabling tasks to be performed anytime and anywhere. It has also succeeded in removing the time and geographical constraints that previously hindered taxpayers. Additionally, the effectiveness of e-filing procedures, the ease of use of digital platforms, the clarity of processes, and the speed of service delivery highlight the presence of a well-designed technical and organizational infrastructure that supports service quality and enhances user engagement.

Furthermore, the 24/7 availability of services and the empowerment of tax officers to perform their tasks efficiently have fostered greater integration among departments and accelerated information transfer. On the organizational level, the results confirm that the adopted service quality framework

plays a pivotal role in upholding high standards in service delivery. Regarding the variation in responses, most items recorded low standard deviations, indicating a relatively high level of consensus among respondents and thereby enhancing the reliability of the findings.

Based on these insights, it can be concluded that digital transformation within the tax administration represents a strategic step toward improving the quality of tax services. However, continued technical support and customization of services to meet the diverse needs of users remain essential for ensuring effective performance and equitable access.

### 3.3.2. Hypothesis Testing

This section presents the results of the hypothesis testing, as follows:

#### - First Hypothesis

The first hypothesis states:

There are statistically significant indicators of the adoption of digital transformation in tax administrations in Eastern Algeria at a significance level of ( $\alpha \leq 0.05$ ).

To test this hypothesis, the following null and alternative hypotheses were formulated:

H<sub>0</sub>: There are no statistically significant indicators of the adoption of digital transformation in tax administrations in Eastern Algeria at a significance level of ( $\alpha \leq 0.05$ );

H<sub>1</sub>: There are statistically significant indicators of the adoption of digital transformation in tax administrations in Eastern Algeria at a significance level of ( $\alpha \leq 0.05$ ).

**Table 5: T-Test Results for the Adoption of Digital Transformation in Tax Administrations in Eastern Algeria**

Variable	T Value	Significance Level	Evaluation
Digital Transformation of Tax Administration	88.64	0.000	Statistically Significant

**Source:** Prepared by the researchers based on SPSS 26 outputs.

As shown in Table 5, the calculated T-value was 88.64 with a p-value of 0.000, which strongly supports the statistical significance of the results. This confirms the alternative hypothesis that there are statistically significant indicators of the adoption of digital transformation in the tax administrations of Eastern Algeria at the ( $\alpha \leq 0.05$ ) significance level.

This result reflects the actual implementation of digital technologies, indicating an institutional shift toward enhancing tax performance through effective digital tools. These tools contribute to improving transparency, accelerating transaction processes, and increasing the efficiency of tax services.

#### - Second Hypothesis

The second hypothesis states:

There are statistically significant indicators of a positive relationship between the digital transformation of tax administration and the quality of tax services in tax administrations in Eastern Algeria at a significance level of ( $\alpha \leq 0.05$ ).

To test this hypothesis, the null and alternative hypotheses were formulated as follows:

H<sub>0</sub>: There are no statistically significant indicators of a positive relationship between the digital transformation of tax administration and the quality of tax services in tax administrations in Eastern Algeria at a significance level of ( $\alpha \leq 0.05$ );

H<sub>1</sub>: There are statistically significant indicators of a positive relationship between the digital transformation of tax administration and the quality of tax services in tax administrations in Eastern Algeria at a significance level of ( $\alpha \leq 0.05$ ).

**Table 6: ANOVA, Correlation, and Determination Coefficient Test for the Relationship Between Digital Transformation and Tax Service Quality in Tax Administrations in Eastern Algeria**

Source	Sum of Squares	Degrees of Freedom	Mean Square	F Value	Sig. Level	Correlation Coefficient	Coefficient of Determination
<b>Regression</b>	48.752	1	48.752	198.314	0.000	0.652	0.425
<b>Residual</b>	88.234	363	0.244				
<b>Total</b>	136.986	364					

**Source:** Prepared by the researchers based on SPSS 26 outputs.

As shown in Table 6, the calculated F-value reached 198.314 at a significance level of 0.000, exceeding the critical table value. This indicates that the model is statistically significant and reliable for explaining the relationship between the studied variables.

The correlation coefficient of 0.652 reveals a moderately strong positive relationship between digital transformation and the quality of tax services. Meanwhile, the coefficient of determination ( $R^2 = 0.425$ ) indicates that 42.5% of the variation in tax service quality can be attributed to digital transformation, while the remaining 57.5% is due to other factors not covered by the model.

Accordingly, the null hypothesis is rejected, and the alternative hypothesis is accepted, confirming the existence of statistically significant indicators of a positive relationship between the digital transformation of tax administration and the quality of tax services in tax administrations in Eastern Algeria at a significance level of ( $\alpha \leq 0.05$ ).

### - Third Hypothesis Testing

The third hypothesis states:

There is a statistically significant positive effect of digital transformation on the quality of tax services in the tax administrations of Eastern Algeria at a significance level of ( $\alpha \leq 0.05$ ).

To test this hypothesis, the following null and alternative hypotheses were formulated:

H<sub>0</sub>: There is no statistically significant positive effect of digital transformation on the quality of tax services in the tax administrations of Eastern Algeria at a significance level of ( $\alpha \leq 0.05$ );

H<sub>1</sub>: There is a statistically significant positive effect of digital transformation on the quality of tax services in the tax administrations of Eastern Algeria at a significance level of ( $\alpha \leq 0.05$ ).

**Table 7: Significance Test of Simple Linear Regression Coefficients for the Effect of Digital Transformation on the Quality of Tax Services in Tax Administrations in Eastern Algeria**

Model	Coefficients	Standard Error	Beta	T Value	Sig.
Constant (A)	0.962	0.158		6.089	0.000
Regression Coef. (B <sub>1</sub> )	0.713	0.037	0.690	19.270	0.000
<b>Regression Equation</b>	Modernization in tax administration = 0.820 + (0.684 × Digital transformation of tax administration)				

**Source:** Prepared by the researchers based on SPSS 26 outputs.

As shown in Table 6, the coefficients of the simple linear regression model are statistically significant. The p-values for both the constant and the regression coefficient are 0.000, which is less than the accepted significance level of 0.05. This indicates that the null hypothesis is rejected in favor of the

alternative hypothesis, confirming that there is a statistically significant positive effect of digital transformation on the quality of tax services in the tax administrations of Eastern Algeria.

The regression coefficient ( $B_1 = 0.713$ ) is positive, suggesting that for every one-unit increase in the level of digital transformation, the quality of tax services is expected to increase by 0.713 units. The high T-value (19.270) further supports the statistical significance of this effect, while the Beta coefficient (0.690) indicates a strong relationship between the two variables.

## Conclusion

The statistical results derived from the simple linear regression model revealed a statistically significant relationship between the two studied variables. The regression coefficient (B) recorded a high value, while both the correlation coefficient and the F-value indicated strong statistical significance, confirming a meaningful and positive impact of digital transformation on the quality of tax services. These indicators reflect the model's strong explanatory power, as digital transformation accounts for a substantial proportion of the variance in the quality of tax services within the tax administrations of Eastern Algeria.

Based on these findings, digital transformation emerges as an effective factor in enhancing the quality of tax services—not only by accelerating and simplifying transactions but also by promoting transparency, improving procedural accuracy, and reducing the chances of tax evasion and administrative errors. The results further underscore the importance of digitization in strengthening tax administration performance and developing its service system, thereby contributing to the creation of a more efficient and responsive fiscal environment that meets taxpayers' evolving needs.

Accordingly, adopting digital transformation is no longer merely a technical option, but a strategic necessity. This requires reinforcing digital infrastructure, developing human competencies, and enhancing system integration to ensure the continuity of operations and the improvement of services amidst rapid institutional and economic transformations.

## Recommendations

In light of the above conclusions, this study proposes a set of recommendations aimed at strengthening the relationship between digital transformation in tax administration and the quality of tax services, thereby maximizing its benefits:

- 1) Enhance the digital infrastructure of tax administrations by systematically investing in modern technologies, including upgrading networks, servers, databases, and adopting advanced software for managing tax transactions;
- 2) Develop continuous training and capacity-building programs for tax personnel, focusing on digital and technical competencies such as the use of tax information management systems, smart data analytics tools, and navigating electronic service platforms;
- 3) Launch interactive and integrated electronic platforms that are user-friendly and multifunctional, enabling taxpayers to remotely access tax administration services, submit inquiries, complete their transactions securely and efficiently, and track their tax files in real-time;
- 4) Promote interoperability among various digital systems within the tax administration by linking databases and systems used across departments and units, ensuring smooth information exchange and eliminating data redundancy and inconsistencies;
- 5) Implement a periodic evaluation system to assess the effectiveness of digital transformation in improving the quality of tax services, using a clear set of measurable Key Performance Indicators (KPIs) such as file processing speed, taxpayer satisfaction, the proportion of digital transactions, and the number of technical failures. This evaluation aims to identify strengths and areas for improvement in the digital transformation process.

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