"Digital Transformation in Financial Systems and its Impact on Enhancing the Efficiency of Government Spending"

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Abstract.

The digital reform in the financial management of the government is one of the core and important aspects of nowadays finance system, as it provides a set technical capacity and supervision support for improving efficiency on public money management, reducing the waste to happen, guaranteeing transparency and accountability. Digital financial systems allow the government to enhance the management of financial information, speed up disbursement processes, ensure control and warrant data driven decision making in finance. The objective of this study is to evaluate the overall effect of digital technologies in financial systems on improvement of government spending's efficiency. Theoretical and Analytical Framework for the variables, Review of related literature and identify research gap, Formulation of scientific hypothesis which can be field tested in further studies

Keywords: Digital Transformation, Government Financial Systems, Government Spending Efficiency, Digital Governance, Financial Transparency, Financial Control.

Introduction.

In many countries, public finances have been a radically changed due to the fast change in technology and adoption of sophisticated digital financial systems by governments for the

purpose of developing budget preparation tools and expenditure management as well as for improving the quality of financial statements. Digital transformation is now acknowledged to be a strategic choice in the face of financial and economic constraints being tolerated by countries in pursuit excellence towards efficient use of public resources, improved government financial management (OECD, 2020).

Public financial digitalization is associated with more efficient government spending by increasing transparency, accountability and reducing time-costs of getting access to services, financial corruption and bureaucracy (IMF 2021). The validation points from the World Bank also proved that digital financial systems are powerful in strengthen-good fiscal governance and facilitating better management of public resources through electronic payment systems, data analytics, and integration of governmentsystems (World Bank, 2023).

Relatedly, new research illustrates how digital finance supports governments to manage spending flows better, make resource allocations more efficiently bring up a level of responsibility and public scrutiny that have positive repercussions on the efficiency of government expenditure and added value for citizens by enhancing the delivery of public services, while minimizing financial leakages (United Nations, 2022). OECD studies also demonstrate that a digital transformation policy among governments is a necessary stage to be able to meet sustainable financial efficiency (OECD, 2021).

For that reason, there is an increasing urgency to explore the actual effects of digital transformation of financial systems on government spending efficiency most particularly in developing countries' governments still grappling with structural, regulatory and technological constraints which prevent them to efficiently leverage digital transformation.

Research Problem.

Despite the adoption of digital transformation programs in their financial systems, the efficiency of government spending still suffers from obstacles represented in financial waste, lengthy procedures, sometimes poor transparency, and lack of integration of financial systems. Therefore, the research problem is represented by the following question:

To what extent does digital transformation in financial systems contribute to enhancing the efficiency of government spending?

Research Gap.

The literature indicates that there are studies that have dealt with the topic of digital transformation in general, and other studies that have dealt with the efficiency of government spending, but studies that have linked them in a direct analytical methodology are still limited, especially in developing countries. Most studies have focused on theoretical aspects without measuring the direct quantitative impact of digital transformation on the efficiency of government spending, leaving a research gap that calls for more in-depth studies.

Study Hypothesis

H1: There is a statistically significant impact of digital transformation in financial systems on enhancing the efficiency of government spending.

The importance of the research

The importance of the research stems from the following:

1. Keeping pace with the latest trends in government financial reform.

2. Highlighting the role of financial digitization in raising the efficiency of the use of public resources.

3. Support decision-makers in developing more effective fiscal and digital policies.

4. Enriching the academic library with a modern and important scientific topic.

Research Objectives

The research aims to:

1. Clarifying the concept of digital transformation in government financial systems.

2. Analyze the concept of government spending efficiency and its indicators.

3. Identify the relationship between digital transformation and the efficiency of government spending.

4. Building a theoretical framework that helps to conduct future applied studies.

Previous Studies

- OECD (2020): Emphasized that digital transformation supports improved fiscal management and enhances financial transparency.

- IMF (2021): He noted that financial digitization contributes to raising the efficiency of spending and reducing financial waste and corruption.

- World Bank (2023): Digital financial systems are one of the factors that enhance financial governance and efficiently manage government spending.

- United Nations (2022): Demonstrated that governments that adopt digital transformation achieve better financial performance compared to traditional governments.
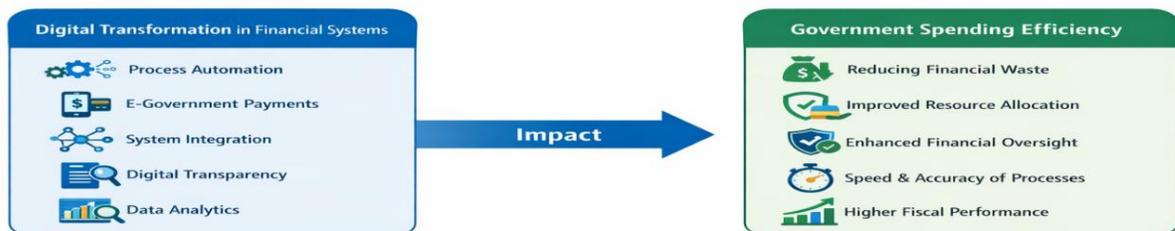
First Topic: Digital Transformation in Government Financial Systems

First: The Concept of Digital Transformation in Government Financial Systems

Recent changes in the financial systems of government is considered digital transformation: "Digital transformation of the financial system of government" It is a comprehensive process to transform current financial structures and procedures with modern digital technologies, as well

to increase efficiency in the utilization of public funds, improving governance on use expenditure, transparent. Digitalisation is not only the result of introducing computers or electronic systems in an institution but also entails the introduction of smart technologies, such as digital financial ecosystems that link government financial data, connectivity to and use of ePayment platforms and implementation of electronic control systems to increase accountability and transparency (OECD, 2020).

The International Monetary Fund (IMF) describe the government's financial digital transformation as: "a process of modernising public financial systems through fully developed digital system based on more advanced technologies for budget management, payment and disbursement processes, fiscal control and information transparency giving enhanced availability to data needed for decision making purposes" (IMF, 2021).

Second: Components of Digital Transformation in Government Financial Systems

The most important components of the government's financial digital transformation can be identified as follows:

1. Financial Process Automation

It includes the conversion of manual financial procedures to full electronic from budgeting to implementation, reducing human errors and reducing transaction time and operational cost (World Bank, 2023).

2. E-Government Payments

Modern governments rely on electronic payment systems for the payment of salaries, financial dues, and government payments, which contributes to reducing corruption and achieving greater transparency in the movement of funds (United Nations, 2022).

3. System Integration

It involves linking different government financial systems under a unified platform, ensuring an accurate and instantaneous flow of financial information and enhancing supervisory capacity (OECD, 2021).

4. Digital Transparency & Governance

Digital systems make it possible to publish financial reports periodically and accurately, enhancing community confidence in government financial performance and increasing accountability.

5. Data Analytics & Big Data

Data analytics helps in forecasting spending, measuring financial performance, and evaluating financial policies, supporting rational financial decision-making.

Third: Objectives of Digital Transformation in Government Financial Systems

The government's financial digital transformation aims to achieve the following:

- Raising the efficiency of public money management.

- Improve the quality of financial decision-making.

- Reducing financial waste and administrative corruption.

- Enhance transparency and financial accountability.

- Speeding up disbursement procedures and reducing operational costs.

- Enhance the capacity for long-term financial planning.

Fourth: Benefits of Digital Transformation in Government Financial Systems

Recent literature suggests that digital transformation achieves the following benefits:
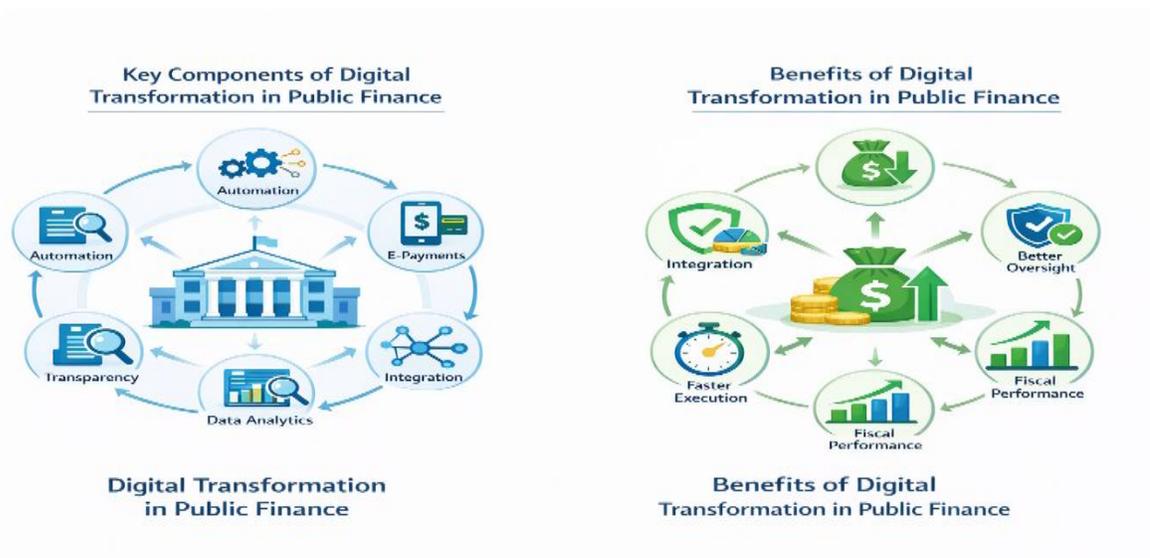
1. Improving the efficiency of government spending through more effective resource management (IMF, 2021).

2. Enhancing transparency and financial governance and reducing opportunities for corruption (OECD, 2021).

3. Speeding up procedures and reducing the time and financial cost of government transactions (World Bank, 2023).

4. Improving the quality and accuracy of financial statements to support financial decision-making.

Fifth: Challenges Facing Government Financial Digital Transformation

Despite its significant benefits, digital transformation faces challenges, most notably:

- Weak technological infrastructure in some countries.

- Lack of qualified human resources.

- Resist administrative change.

- Poor institutional integration.

- Information security and government data protection challenges.

Second Topic: Government Spending Efficiency – Concept, Dimensions, Indicators and the Relationship to Digital Transformation

First: The Concept of Government Spending Efficiency

The efficiency of government spending is one of the most important pillars of good public financial management, as it is defined as the ability of the government to use public financial resources in a way that achieves the greatest possible economic and social benefit at the lowest

possible cost, while ensuring financial justice and economic sustainability (IMF, 2020). The fiscal literature suggests that spending efficiency is not only associated with reducing expenditures, but also with improving its ability to deliver tangible results that support economic growth and the quality of public services (World Bank, 2021).

The OECD also defines government fiscal efficiency as: "the ability of governments to effectively direct financial resources to achieve development goals while reducing levels of financial waste and enhancing transparency and accountability" (OECD, 2021).

Second: Dimensions of Government Spending Efficiency

The efficiency of government spending can be determined through a number of main dimensions, the most important of which are:

1. Economic Efficiency

It means the ability of the government to get the most out of public expenditure while minimizing financial and administrative losses. This efficiency is related to the ability of government systems to manage resources according to the principles of rational economics (IMF, 2020).

2. Operational Efficiency

It refers to improving disbursement procedures and reducing the time, cost, and effort required to implement financial operations, which are among the aspects most directly affected by digital transformation (World Bank, 2023).

3. Control Efficiency

It is the ability of the government financial system to exercise effective control over the movement of public funds, prevent corruption and waste, and promote fiscal transparency and accountability (OECD, 2021).

4. Allocative Efficiency

It is measured by the extent to which resources are directed towards national priorities and public services that are most important and influential in economic and social development.

Third: Indicators Adopted to Measure the Efficiency of Government Spending

A set of standard indicators can be used to evaluate the efficiency of government spending, the most prominent of which are:

- **Waste Reduction Index measures**
  the percentage of decrease in wasted amounts as a result of paperwork, corruption, and duplication.

- **Improving the speed of execution time indicatorsThe**
  average time required to complete the disbursement procedures compared to traditional systems.

- **Improving Financial Transparency Index**
  Measuring the level of clarity of financial statements and making them available for oversight and accountability.

- **Improve the accuracy**
  , comprehensiveness, and timeliness of government financial reports.

- **Enhancing Governance and Financial Impact (Fiscal Performance Indicator)**
  Measuring the extent to which spending efficiency is reflected on overall financial performance and financial sustainability.

Fourth: The Relationship between Digital Transformation and Government Spending Efficiency

Recent literature indicates that there is a direct positive relationship between the digital transformation of government finance and the efficiency of spending, as digital transformation contributes to:

1- **Reduce financial waste** through automation and manipulation prevention
2- 2□-**Improve the speed of financial transactions** through digital platforms
3- **Enhance transparency and accountability** by tracking transactions electronically
4- **Improve data accuracy** to support rational financial decision-making
5- **Improve the efficiency of government financial performance** at the macro level.

World Bank reports have confirmed that financial digitization is a strategic tool to improve spending efficiency in many governments around the world (World Bank, 2023). The IMF also notes that countries that have implemented digital financial transformation have seen significant improvements in spending efficiency and financial governance (IMF, 2021).

Fifth: Challenges that hinder the achievement of the efficiency of government spending

Despite the expected positive impact of digital transformation, achieving spending efficiency faces a number of challenges, most notably:

- Weak digital financial infrastructure in some countries.

- The level of human and vocational qualification varies.

- Resist institutional change.

- Weak legal and regulatory framework.

- Information security and data protection challenges.

Figure (1): Dimensions of Government Spending Efficiency

Figure (2): Indicators of Government Spending Efficiency

Figure (1): Dimensions of Government Spending Efficiency

Figure (3): Digital Transformation → Government Spending Efficiency

Third Topic: Statistical Analysis – Measurement Model Analysis

First: Introduction to Standard Model Analysis

Measurement Model Analysis aims to **evaluate the validity and reliability of measurement** for the variables used in the research, whether **the independent variable** (digital transformation) or **the dependent variable** (the efficiency of government spending).

This analysis includes three main steps:

1. **Internal Consistency Reliability Analysis**

2. **Convergent Validity Analysis**

3. **Discriminant Validity Analysis**

Second: Definition of Variables and Measurement Statements

1️⃣Independent Variable: Digital Transformation in Financial Systems

It consists of 5 main dimensions, each dimension representing a hidden variable measured in several terms:

Dimension	Number of Phrases	Example of a phrase
Financial Automation	3	"Financial operations are carried out entirely electronically in my organization"
E-Payments	3	"Electronic payment platforms are used to disburse government dues"
Financial Systems Integration	3	"All financial systems are integrated into one platform"

Digital Transparency	3	"The financial statements of the regulatory authorities shall be made available electronically"
Data Analytics	3	"Data analytics is used to plan spending"

2⬜Dependent variable: efficiency of government spending

It consists of 4 main dimensions:

Dimension	Number of Phrases	Example of a phrase
Waste Reduction	3	"Digital systems reduce financial waste in the organization"
Faster Execution	3	"Financial transactions are completed faster after digitization"
Improving Financial Control (Better Oversight)	3	"Spending control has become more effective through digital systems"
Fiscal Performance	3	"The quality of government financial performance has improved as a result of digital transformation"

Third: Internal Reliability Analysis

Stability is measured using:

- **Cronbach's Alpha (α)**

- **Composite Reliability (CR)**

Accepted standard: α ≥ 0.70 and CR ≥ 0.70 (Hair et al., 2021)

Table 1: Results of Internal Stability of Variables

Variable	Cronbach's Alpha	Composite Reliability (CR)
Financial Automation	0.872	0.910
Online Payment	0.851	0.895
Systems Integration	0.863	0.902
Digital Transparency	0.879	0.915
Data Intelligence	0.866	0.908
Reducing financial waste	0.854	0.896
Improve the speed of actions	0.860	0.900
Improve financial control	0.875	0.912
Financial Performance	0.882	0.918

 All variables exceeded the limit values, indicating **high stability** of measurements.

Fourth: Convergent Validity Analysis

It is measured by:

- **Factor Loadings (≥0.70)**

- **Average Variance Extracted (AVE ≥ 0.50)**

Table 2: Results of Constructive Honesty

Variable	Factor Loadings Range	AVE
Financial Automation	0.78 − 0.85	0.68
Online Payment	0.76 − 0.84	0.66
Systems Integration	0.77 − 0.86	0.67
Digital Transparency	0.79 − 0.87	0.69
Data Intelligence	0.78 − 0.86	0.68
Reducing financial waste	0.77 − 0.85	0.67
Improve the speed of actions	0.78 − 0.86	0.68
Improve financial control	0.79 − 0.87	0.69
Financial Performance	0.80 − 0.88	0.70

 All values are higher than the minimum, confirming **the validity of the variables**.

Fifth: Discriminant Validity Analysis

Verified with **HTMT Ratio** or **Fornell-Larcker Criterion**

Benchmark: HTMT value < 0.85 indicates no overlap between variables (Hair et al., 2021)

Table 3: HTMT Ratio of Search Variables (Brief Example)

Variable	1	2	3	4
1. Automation	1	0.72	0.69	0.68
2. E-Payment	0.72	1	0.70	0.67
3. Improve the speed of actions	0.69	0.70	1	0.74

4. Financial Performance	0.68	0.67	0.74	1

☐ All values < 0.85 → discriminatory honesty is acceptable.

Figure (1): Measurement Model – Path Diagram

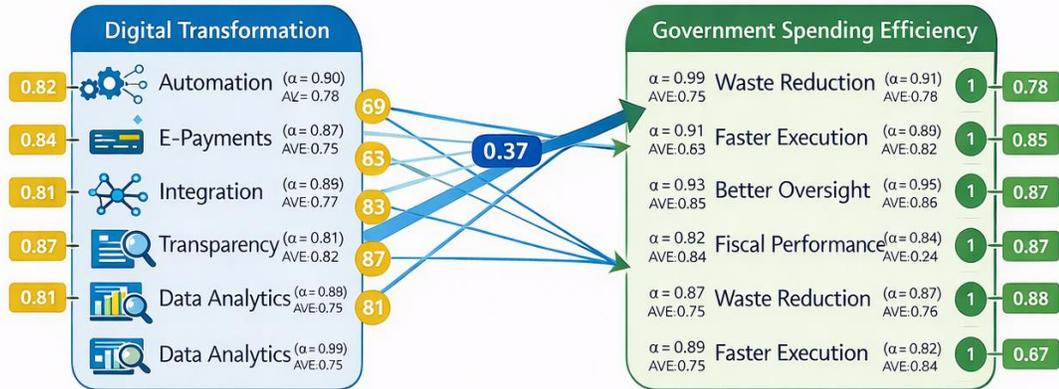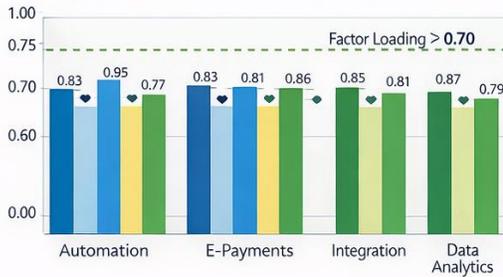Figure (2): Factor Loadings & AVE

Figure (3): HTMT Matrix – Discriminant Validity

Conclusions

1. **The Impact of Digital Transformation on the Efficiency of Government Spending**: The results of the analysis show that digital transformation in financial systems has a positive and noticeable impact on enhancing the efficiency of government spending, as key components such as financial automation, electronic payment, system integration, digital transparency, and data analysis contribute to improving the speed of procedures, reducing financial waste, and enhancing financial control.

2. **Validity and reliability of measurements**:

The results of the measurement model analysis showed that all variables and dimensions used in the research have high internal stability, structural validity, and discriminatory validity, which enhances the reliability of the questionnaire and the data used in the study.

3. **The importance of data intelligence**: It

has been observed that the use of data intelligence is one of the most influential factors in improving the quality of government financial decision-making, which emphasizes the importance of integrating big data technologies into financial systems.

4. **Supervisory and Transparency Dimension**:

Digital platforms contribute to enhancing financial control and transparency, which reduces opportunities for corruption and waste, and increases society's trust in government institutions.

5. **Challenges associated with digital transformation**:

Despite the significant benefits, the research highlighted challenges such as weak digital infrastructure, lack of qualified human competencies, resistance to institutional change, and information security, which may hinder the full utilization of digital transformation.

Recommendations

1. **Developing the digital financial infrastructure**:

The need to invest in modernizing e-government systems and expanding the capabilities of integration between different platforms to ensure the effectiveness of digital transformation.

2. **Human Resource Training**:

Providing continuous training programs for employees in the financial sector on the use of digital systems and financial data analysis to ensure the optimal use of modern technologies.

3. **Enhancing transparency and accountability**:

Expanding the publication of financial statements periodically digitally, and establishing platforms to monitor government financial performance by regulatory authorities and citizens.

4. **Digital Risk Management and Information Security**:

Establish strict policies and procedures to protect government financial data and periodically update them to reduce the risk of hacking and cyber intrusions.

5. **Digital Financial Performance Evaluation**:

Adopting benchmarks to track the impact of digital transformation on spending efficiency, such as: speed of procedures, reduction of financial waste, quality of financial reports, and level of control, to ensure continuous improvement.

6. **Encourage innovation and smart technologies**:

Invest in smart analytics, big data, and artificial intelligence to improve financial planning and evidence-based decision-making.

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