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The Impact of the Financial Technology and the Governance of Public Utilities: Opportunities and Challenges

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ABSTRACT

This study aims to examine the impact of financial technology (FinTech) on the governance of public utilities. The research employed a descriptive-analytical approach and concluded that the use of FinTech has positive effects on public utility governance, such as achieving financial inclusion, diversifying economic activity, and combating governmental corruption. However, negative effects were also identified, including risks related to non-compliance with consumer protection and data protection regulations. The study recommends the integration of sustainability approaches into soft technologies, engaging decision-makers, government sectors, and stakeholders in the adoption of FinTech in service utilities, and aligning these practices with the United Nations Sustainable Development Goals (SDGs) 2030.

Keywords: Financial Technology (FinTech), Public Utilities Governance, Sustainable Development Goals 2030

INTRODUCTION

The concepts of financial technology and governance emerged with the advent of the internet and modern technologies, along with the growing need to improve financial activities and develop banking services. FinTech has become widely applied across various domains, including service sectors, governmental institutions, corporations, and banks. Financial technology refers to financial innovation that can lead to new business models, applications, processes, products, or services with significant effects on financial markets, institutions, and service delivery.

Electronic governance of public utilities, on the other hand, is based on ensuring integrity and transparency in transactions offered by public service entities, enhancing state oversight to foster collaboration between officials, citizens, local administrations, and private companies through access to and utilization of information. Nevertheless, the public sector faces several challenges in adopting FinTech and governance, including fraud, risk management, cyberattacks, security, and privacy. Projections indicate that by 2030 there will be more than 500 billion internet-connected devices within governmental financial sectors.

This enormous number of mobile devices, internet-enabled tools, and digital services across both public and private sectors requires vast networks and advanced infrastructure. FinTech directly influences the financial service sector by enhancing efficiency, competitiveness, and access to financial services for all. It also plays a significant

role in fostering financial innovation, supporting emerging economies, and driving growth in the small and medium-sized enterprise (SME) sector.

In this context, modern technologies compel government institutions and private corporations to harness the Internet of Things (IoT) to become more perceptive, predictive, resilient, and performance-driven. These qualities enable faster innovation and the achievement of desired outcomes. Thus, institutions must implement a digital framework built upon four key pillars: technology, data, people, and processes.

Accordingly, this study seeks to explore the impact of financial technology on improving the quality of financial services provided by public utilities, in addition to identifying the challenges and opportunities facing the adoption of FinTech in the current environment. The research aims to answer the following questions:

1. What is the role of FinTech in shaping the governance of public utilities?
2. What are the main challenges and opportunities associated with adopting FinTech in the current context?

This paper is organized as follows: Section One presents the introduction, Section Two reviews related literature on FinTech and public utilities governance, Section Three discusses findings and analysis, and the final section provides the conclusion.

Related Studies on FinTech and Public Utilities Governance

Several studies have addressed the intersection between financial technology and governance in public utilities, highlighting both opportunities and challenges.

Zhang and Chen (2019) emphasized that FinTech contributes to enhancing transparency and accountability in public financial management systems by reducing bureaucratic inefficiencies and limiting opportunities for corruption. Their findings indicate that blockchain and digital payment systems significantly strengthen public governance mechanisms.

According to the World Bank (2020), digital financial services play a crucial role in improving access to public utility payments, such as electricity, water, and transport, by facilitating efficient collection and reducing leakages in government revenues. The study also found that FinTech adoption improves citizen trust in public institutions when transparency is ensured.

Al-Khater and Nassar (2021) analyzed the impact of FinTech adoption in Middle Eastern public service sectors, noting that while it enables greater financial inclusion and operational efficiency, it also raises concerns regarding data privacy, consumer protection, and cybersecurity.

The OECD (2021) highlighted that integrating FinTech with public utilities governance supports the achievement of Sustainable Development Goals (SDGs) 2030, particularly in promoting inclusive access to financial and utility services. However, the study warns of regulatory gaps and the urgent need for international cooperation in setting standards.

El-Sayed and Hassan (2022) explored the use of mobile payment systems for public transportation in developing countries. Their study revealed that FinTech applications improve efficiency in fare collection, reduce corruption in service delivery, and enhance overall governance in urban utilities.

The United Nations ESCWA (2023) stressed that digital transformation in public utilities, powered by FinTech solutions, enables governments in the MENA region to strengthen governance frameworks, improve citizen engagement, and ensure equitable access to essential services.

Taken together, these studies demonstrate that FinTech can act as a catalyst for improving governance in public utilities by enhancing financial inclusion, transparency, and efficiency. At the same time, they underscore the importance of addressing associated risks such as data protection, consumer rights, and regulatory compliance.

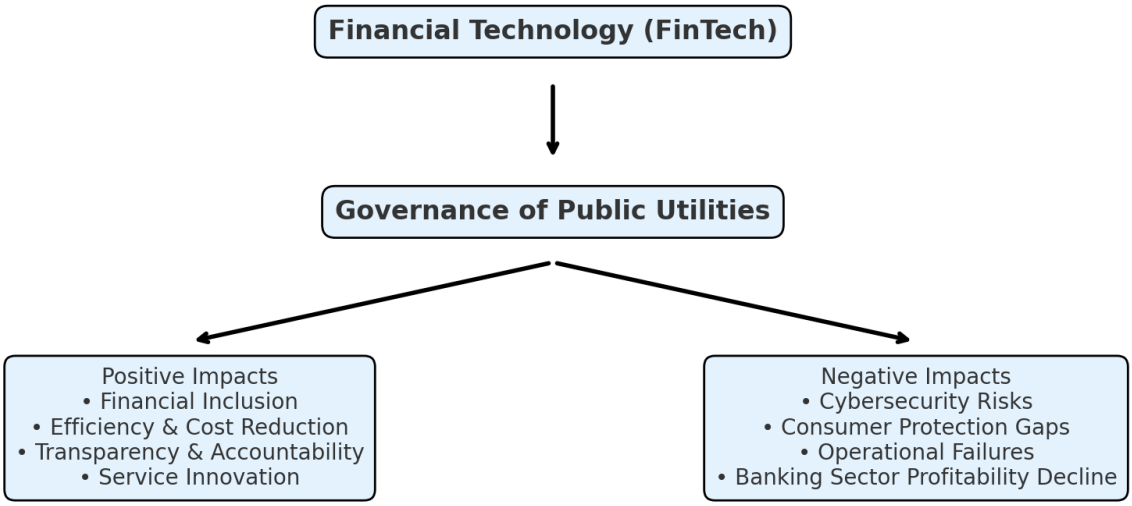
RESEARCH METHODOLOGY

This study adopts a descriptive–analytical approach, which is particularly suitable for investigating contemporary issues where empirical data remain limited but theoretical and practical insights are growing. The methodology relies on an extensive review and synthesis of previous literature published in peer-reviewed journals, policy reports, and institutional frameworks related to financial technology (FinTech) and public utilities governance.

The descriptive component provides a systematic overview of key concepts, principles, and strategies associated with FinTech applications in governance, while the analytical component critically evaluates both the positive impacts (such as financial inclusion, efficiency, and transparency) and the negative risks (including cybersecurity, consumer protection, and operational vulnerabilities).

By integrating findings from prior research, this method enables the study to address its central research questions and highlight emerging opportunities, challenges, and policy implications. The approach also ensures that the analysis remains grounded in existing knowledge while paving the way for future empirical investigations.

Figure 01:Research Methodology Framework: Examining the Impact of FinTech on Public Utilities Governance



Source: Developed by the researchers based on the descriptive–analytical method and previous literature (2025).

RESULTS AND DISCUSSION

Positive Impacts of FinTech on Public Utilities Governance

1. **Financial Inclusion and Economic Diversification**
2. FinTech fosters financial inclusion by enabling individuals and public service institutions to access affordable and useful financial products and services, such as digital payments, savings, credit, and insurance. These services are delivered responsibly and sustainably, promoting equitable access. Moreover, FinTech contributes to economic diversification by offering innovative financing mechanisms for small and medium-sized enterprises (SMEs), improving financial stability through compliance and risk management tools, and facilitating international trade and remittances via efficient cross-border payment systems (World Bank, 2020; OECD, 2021).

3. **Reducing Financial Transaction Costs**
4. Digital platforms and blockchain applications lower the cost of financial transactions, including loan requests and service payments, while saving time and effort. The availability of big data and advanced financial analytics allows utility providers to redesign products and improve service delivery. Blockchain-based systems, for instance, enable secure peer-to-peer transactions without requiring traditional bank accounts, enhancing efficiency in public utility payments (Zhang & Chen, 2019; El-Sayed & Hassan, 2022).

5. **Curbing Governmental Corruption**

   FinTech strengthens transparency and accountability in resource management by digitizing financial flows, thereby reducing opportunities for misuse of public funds. Digital payments and blockchain-based auditing mechanisms promote integrity in governance, enhance citizen trust in public institutions, and support the protection of public assets (Al-Khater & Nassar, 2021; United Nations ESCWA, 2023).

6. **Enhancing Public Service Delivery**

   Emerging technologies, including artificial intelligence (AI), machine learning, big data analytics, and cloud-based solutions, have created opportunities to innovate financial services. These tools not only accelerate service delivery but also enhance public utilities' ability to adapt to citizen needs, offering smarter, more responsive, and more resilient governance models (OECD, 2020; ESCWA, 2023).

FinTech Services in Public Utilities

Payment Services

One of the most prominent contributions of financial technology (FinTech) is the provision of diverse and innovative payment solutions. Customers now have access to multiple options, such as:

- Mobile payments: facilitating faster and easier transactions through smartphones and digital wallets.
- Low-cost international transfers: enabling cross-border remittances at lower fees, which is particularly beneficial for migrant workers.
- Currency exchange without fees: offering cost-efficient alternatives to traditional money changers.
- Payment flow management for e-commerce: supporting businesses with efficient digital payment gateways and transaction monitoring.

These innovations enhance both financial inclusion and the efficiency of public utility payments, such as electricity, water, and transportation services (World Bank, 2020; OECD, 2021).

Investment and Financing

FinTech also simplifies investment and financing opportunities by:

- Offering accessible savings and investment options for individuals.
- Providing crowdfunding platforms that allow companies, especially small and medium-sized enterprises (SMEs), to raise capital in the form of loans, equity, or donations.
- Delivering tailored investment proposals to clients through algorithm-driven financial advisory systems.

Such mechanisms strengthen economic diversification and promote entrepreneurial growth while aligning with Sustainable Development Goals (SDGs) (Zhang & Chen, 2019; Al-Khater & Nassar, 2021).

Big Data–Driven Banking Services

FinTech provides advanced solutions for the banking and financial sector by collecting and analyzing large volumes of customer data. These capabilities enable banks to:

- Manage customer relationships by analyzing behavioral patterns (e.g., purchasing, saving, and credit repayment).
- Strengthen cybersecurity through real-time fraud detection, supported by geolocation services and advanced encryption techniques.
- Improve risk analysis by using predictive models based on big data analytics.

These technological advancements allow financial institutions and public service providers to enhance efficiency, security, and personalization in delivering financial and utility services (El-Sayed & Hassan, 2022; ESCWA, 2023).

Negative Impacts of FinTech on Public Utilities Governance

While FinTech offers significant advantages, it also generates several short- and long-term risks that may affect financial services, public utilities, and the broader economy.

1. High Operational Risks

The integration of financial technologies into service sectors increases informational interdependence between financial institutions and market infrastructure. Any disruption in information systems can quickly escalate into a systemic crisis, particularly when a dominant provider monopolizes financial services. This challenge is exacerbated by the lack of expertise among some providers in managing information security and technological risks (Zhang & Chen, 2019).

2. Liquidity and funding risks

FinTech encourages consumers to move their savings accounts toward platforms offering higher returns, reducing customer loyalty to traditional banks. This behavior increases liquidity risks, as banks may face sudden withdrawals that affect their financial stability (Al-Khater & Nassar, 2021).

3. Non-compliance with consumer and data protection rules:

The absence of strong regulatory frameworks and consumer protection measures exposes digital platforms to risks of cyberattacks and data breaches. Such vulnerabilities may lead to severe financial losses, reputational damage, and systemic risks. Additionally, the anonymity of certain transactions facilitates illicit activities, including money laundering and fraud (OECD, 2021).

4. Profitability risks:

Low-cost, fast, and widely accessible FinTech services, unconstrained by geography, income, or social class, threaten the market share of traditional banks. As a result, banks are forced to reduce product prices, lowering their profitability. Estimates suggest that bank profits could decrease by up to 44.5% by 2025 (World Bank, 2020).

CONCLUSION

This research highlighted the dual impact of FinTech on public utilities governance. On the positive side, FinTech promotes financial inclusion, economic diversification, and greater transparency in government services, thereby reducing corruption. On the negative side, it introduces risks related to consumer protection, cybersecurity, operational failures, and declining profitability in the banking sector.

The study recommends:

- Coordinated efforts across all sectors and government levels to strengthen regulatory oversight.
- Enhanced protection of customer data against cyber threats.
- Effective risk management and continuous evaluation mechanisms.
- Integration of sustainability principles in FinTech adoption.
- Active involvement of decision-makers, regulators, and public utility stakeholders to align FinTech use with the Sustainable Development Goals (SDGs) 2030.

Taken together, FinTech should be viewed as both an opportunity and a challenge for modern governance, requiring a balance between innovation, consumer protection, and systemic stability.

FUTURE RESEARCH DIRECTIONS

While this study provides insights into the opportunities and risks of FinTech in public utilities governance, further research is needed to deepen understanding in several areas:

1. Comparative Studies Across Regions: Future research could examine how the impact of FinTech on governance varies across developed, emerging, and low-income economies, given differences in regulatory maturity, digital infrastructure, and financial literacy.
2. Longitudinal Analysis: There is a need for studies that track the long-term effects of FinTech adoption on public utilities, particularly in terms of service efficiency, financial inclusion, and systemic stability.
3. Technological Innovations: Research should explore the role of specific technologies—such as blockchain, artificial intelligence, and big data—in shaping governance frameworks for public utilities.
4. Consumer Protection and Ethics: Further work is required on the ethical dimensions of FinTech, including data privacy, digital inequality, and the risks of financial exclusion for vulnerable populations.
5. Policy and Regulation: Future studies could assess the effectiveness of different regulatory models in balancing innovation with risk mitigation, and how such frameworks can be aligned with the Sustainable Development Goals (SDGs) 2030.

By addressing these gaps, future research can contribute to a more comprehensive understanding of how FinTech can be leveraged to improve governance, foster trust, and ensure sustainable development in public service delivery.

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