



MECHANISMS FOR FINANCING DIGITAL TRANSFORMATION AND INDICATORS OF GOVERNMENT AUTOMATION

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Abstract:

In a world undergoing rapid digital evolution, digital transformation is no longer a strategic choice but a legal necessity imposed by the demands of e-governance, the digital economy, and individuals' rights to secure and efficient digital services. However, this transformation faces significant legislative hurdles and a lack of comprehensive legal frameworks, creating a regulatory void that threatens sovereign data security and undermines investor confidence in the digital landscape.

Governments now bear a critical legal responsibility: either they adapt with agile legislation that balances innovation with rights protection, or they face legal disputes, cyber threats, and the risk of falling behind in the global digital race. Delayed legislation offers no shield, and weak digital governance exposes nations to the peril of losing digital sovereignty, where data, digital currencies, and artificial intelligence become instruments of control in the hands of dominant global powers.


Keywords: digital legislation, electronic governance, cybersecurity, data protection, legal compliance, digital economy, smart infrastructure, digital transformation finance, interoperability.

INTRODUCTION:

Governments around the world are experiencing a rapid digital transformation aimed at improving the quality of public services and meeting citizens' needs in more efficient and flexible ways. "Smart governments" have emerged as one of the prominent trends in this area, relying on advanced digital mechanisms to enhance government performance and foster innovation in service delivery. These mechanisms include the use of artificial intelligence, big data, and the Internet of Things, alongside digital infrastructure that supports the seamless operation of government systems and facilitates effective communication among various entities.

The significance of digital transformation lies in improving operational efficiency, reducing costs, and providing flexible services that meet citizens' expectations. It also creates new opportunities for interaction and community participation in decision-making. To assess the success of digital transformation, several indicators are measured, including efficiency, transparency, accessibility, and the rate of innovation in service delivery. Through these indicators, governments can evaluate the extent to which they achieve their strategic objectives in areas such as sustainable development, social empowerment, and economic advancement, ultimately contributing to improving citizens' quality of life and elevating society as a whole.

On the other hand, digital transformation in smart governments raises several legal challenges and issues, as the success of these mechanisms requires a comprehensive legal framework that keeps pace with technological advancements and ensures the protection of public rights and interests. The most significant legal issues relate to privacy and the protection of personal data, as the need to secure government data and citizens' private information increases with the expanded use of smart technologies and digital systems. Furthermore, digital transformation raises questions about transparency and accountability in data management, as well as the commitment of government institutions to international standards for data protection and cybersecurity.



Indicators of success for digital transformation in smart governments, such as efficiency, transparency, and ease of access to services, necessitate the development of new laws to regulate digital contracts and find legal solutions to ensure the security of electronic transactions and their legal traceability. The issue of the “digital divide” also arises, as unequal access to advanced technology may marginalize certain segments of society, placing a legal challenge on governments to ensure comprehensive and equal access to digital services.

Thus, the legal framework supporting digital transformation must be flexible enough to keep pace with innovation while being stringent in guaranteeing individuals’ rights and digital security, which is a key element in ensuring the success of smart governments and achieving targeted success indicators.

But how can digital transformation be effectively financed? And how can its impact on the performance of smart government be measured? These are the critical questions that strongly arise in the context of this research. Answering these questions requires a comprehensive study of the various mechanisms for financing digital transformation, identifying appropriate indicators to measure its impact, and determining the challenges facing this transformation while proposing suitable solutions.

By addressing this issue, this research aims to contribute to a deeper understanding of the digital transformation process and provide practical recommendations for decision-makers and specialists in this field.

1. KEY MECHANISMS FOR FINANCING DIGITAL TRANSFORMATION AND THEIR CHALLENGES

First: Government Budgets as a Mechanism for Financing Digital Transformation

Government budgets are the cornerstone for understanding how to finance digital transformation projects at the government level. They are the primary tool used by countries to allocate financial resources to various sectors, including technology and digital transformation. In this analysis, we will break down this section into its components, focusing on the legal and procedural aspects of financing digital transformation projects through government budgets.

Taking Algeria as a model, given that information and communication technologies have become the most significant driving forces relied upon to successfully implement social and economic development programs—whether regional or national, and across all sectors—the Algerian government has prioritized the development of information and communication technologies and the resulting digital transformation of Algerian society¹.

In this context, the Ministry of Finance emphasized in 2024 the utmost importance of digital transformation currently being implemented in the finance sector, indicating that ongoing reforms in this regard particularly allow for the establishment of an integrated budget management system.

Regarding the Algerian-European program to support public financial management and the allocation of local resources in Algeria, between Algeria and the European Union, the Ministry of Finance is fully aware of the critical necessity to incorporate innovative technologies, especially artificial intelligence and digitization, in the effective management of public finances and maintaining a modern and competitive economy.

Moreover, the ministry is working diligently to implement public finance reform, particularly framed by Organic Law No. 18-15 on finance laws, which has been accompanied and supported by digital transformation through the establishment of a robust and effective information system.

To clarify, the public authorities’ willingness to realize digital transformation in the sector indicates that the integrated budget management system has been defined, emphasizing that it is a central

¹- Speech by the Secretary-General titled “Prospects for Digital Transformation in Algeria,” virtual meeting of Arab e-Government Program Directors organized by ESCWA on December 16, 2021.

tool within the information system for managing public finances, as it covers a large part of the budget and accounting structure.

The ministry also emphasized the importance of the deep reforms that have been initiated, which include the public finance management system to enhance budget control, increase the allocation of public resources, and improve the effectiveness of services provided by the state.

Additionally, it aims to improve the business climate, stimulate entrepreneurship, and expand the tax base. These reforms relate to the issuance of the organic law of 2018 concerning the finance law, which resulted in a significant legal framework covering investment, accounting, public contracts, and the banking sector¹.

1. Factors Influencing Budget Allocation for Digital Transformation Projects

Allocating budgets for digital transformation projects is a process that requires careful planning and prioritization. This process includes the following steps:

- **Identifying Needs:** In this phase, the technological needs of government institutions are identified, and the projects that will directly contribute to achieving digital transformation goals are determined.
- **Estimating Costs:** The financial costs necessary for implementing these projects are estimated, including infrastructure costs, software costs, and training costs.
- **Setting Priorities:** Projects are ranked according to their importance and the expected impact on achieving digital transformation goals
- **Allocating Budgets:** Financial amounts are allocated to each project listed in the budget.
- **National Priorities:** The national priorities of the country determine which projects will receive priority in funding.
- **Political Pressures:** Political pressures may influence budget allocation, as larger amounts may be allocated to projects that have political support.
- **Financial Efficiency:** Budget allocation must be aligned with the financial condition of the state.

2. Challenges Associated with Budget Preparation and Implementation:

- **Lack of Transparency:** Some countries may suffer from a lack of transparency in the budget preparation and implementation process, which facilitates corruption. Therefore, digital technologies work to enhance transparency and accountability in government operations by providing greater visibility into decision-making processes, tracking expenditures, and preparing performance reports. Open data initiatives, data visualization tools, and online dashboards enhance transparency and empower citizens to hold government officials accountable.
- **Bureaucracy:** Complex bureaucratic procedures may delay the approval and implementation of budgets.
- **Unexpected Changes:** Unforeseen events, such as economic crises and natural disasters, may require budget adjustments, affecting project implementation.
- **Lack of Financial Resources:** Many countries may face a shortage of financial resources necessary to fund wide-scale digital transformation projects.
- **Dependency on Oil Revenues:** In oil-producing countries, a decline in oil prices may reduce government revenues and impact their ability to finance digital transformation projects.

¹- <https://www.sabqpress.dz/> / , October 28, 2024, 11:34.

- **inefficiency in Government Spending:** Inefficiency in government spending may lead to resource wastage and delays in achieving digital transformation goals.

Thus, government budgets are considered a fundamental tool for financing digital transformation projects, but they face numerous challenges. To achieve success in this area, governments must work to enhance transparency and accountability in the budget preparation and implementation process, seek additional funding sources, and build their institutional capacities for managing digital projects.

Second: Foreign Direct Investment in Digital Transformation

Foreign direct investment (FDI) is one of the most important drivers of economic growth and digital transformation in many countries. It brings in the capital, technology, and expertise necessary to develop digital infrastructure and enhance the efficiency of institutions¹.

Economically, investment is defined as the allocation of capital to acquire new productive means to develop existing means with the aim of increasing productive capacity. This definition is criticized for only representing the transition of capital from a monetary form to a productive form; it overlooks the fact that investment can occur in real or financial assets in pursuit of specific goals. Additionally, investment can take a technical form, such as patents and licenses, or a human form, such as experts, technicians, and administrators.

Investment can be classified into two types: either domestic (national) investment or foreign investment. Foreign investment refers to any investment made outside the national borders of the investors, thus it is considered foreign investment in the country where it is invested. The investing entity can be a country, a group of countries, a company, a group of companies, or even individuals. There are also two types of foreign investment: direct investment and indirect investment. The first type (direct) is characterized as a long-term investment that involves a permanent interest and control by a resident entity in one economy (represented by the parent company) over a project established in another economy. Here, the foreign investor exerts a significant degree of influence over the management of the project located in a country other than their home country².

The importance of foreign investment lies in its ability to drive the local economy by improving its capacity to interact with the global economy and participate in international production processes. In this way, this investment serves as a lever that transitions the economy to a more efficient one, connected to the global economy and contributing to international production processes. However, if the goal of foreign direct investment is solely to obtain financial resources, it remains, despite its importance, of limited impact. This underscores the significance of the state's investment policy and the necessity for this policy to be part of the overall economic policy and within the framework of economic financing strategy to join the global economy, rather than being a policy with limited and modest objectives confined to providing financial resources, despite its importance.

In this context, we will conduct an in-depth analysis of the role of foreign direct investment in digital transformation, focusing on the governing legal frameworks, the incentives provided by governments, the legal conditions for investment, and the potential risks.

1. Legal Frameworks Governing Foreign Direct Investment

The legal frameworks regulating foreign direct investment vary from one country to another, but they generally include a set of laws and regulations covering the following aspects:

¹- Ola Al-Shafie, "Understanding the Concept of Foreign Direct Investment (FDI) and Its Role in the Economy," [Youm7](<https://www.youm7.com>), Monday, May 1, 2023, 09:00.

²- Maawiya Ahmed Hussein, "Foreign Direct Investment and Its Impact on Economic Growth and Integration in the Gulf Cooperation Council," Journal of King Abdulaziz University: Economics and Management Volume 28, Issue 2, 2014, p. 103.

- **Investment Law:**¹ This law outlines the necessary procedures for establishing foreign companies, their rights and obligations, and the incentives provided by the government to foreign investors.
- **Company Law:**² This regulates the establishment, registration, management, and dissolution of companies.
- **Labor Law:**³ This governs the employment relationships between foreign companies and their employees
- **Tax Law:**⁴ This specifies the taxes imposed on foreign companies and their profits.
- **Other Laws:** These may include laws related to financial transfers, intellectual property protection⁵, and environmental protection⁶.

Arab countries, particularly those in the Gulf Cooperation Council, including Qatar and Saudi Arabia, have placed significant emphasis on cultural and media development in their national vision for 2030. “Saudi Vision 2030” includes key initiatives to attract foreign direct investment and develop the media and entertainment sectors in the Kingdom, aiming to increase household spending on entertainment from 2.9% to 6%. Meanwhile, Qatar’s National Vision 2030 aims to build a sustainable media ecosystem through investment in modern media infrastructure and talent development.

It is well-known that Qatar is considered the media city and the main driver of the media industry in the country, serving as a media hub and incubator for companies, entrepreneurs, innovators, and creative talents. The media city, headquartered in Doha, leads initiatives aimed at bridging cultural gaps and enhancing international cooperation. The media city’s responsibilities encompass three aspects: organizing business activities, development, and investment, which includes creating and developing business incubators, granting licenses and permits, and providing facilities equipped with the latest media technologies.

These initiatives, along with development programs implemented by educational institutions to enhance workforce skills and the ongoing growth of media institutions such as Al Jazeera Network and beIN Sports channels, are expected to result in a market growth of 10.21% during the period from 2024 to 2029, according to market insights published by the Statista platform.

As for Algeria, in light of its recent interest in foreign investment, the country has subjected foreign investment to the system applicable to investments executed in economically productive activities, primarily under the provisions of Law No. 22-18 concerning investment, dated July 24, 2022, and its implementing texts, published in Official Gazette No. 50. Specifically, Article 2 states, “....giving preference to technological transfer, innovation development, and the knowledge economy...”

The provisions of this law aim to encourage investment to develop priority sectors with high added value, ensure sustainable and balanced development, and enhance local natural resources and raw materials.

¹- Law No. 22-18 dated July 24, 2022, concerning investment and its implementing regulations, Official Gazette No. 50.

²- Decree No. 75-59 dated September 26, 1975, amended by Law No. 22-09 dated May 5, 2022, concerning the Commercial Law, Official Gazette No. 32.

³- Law No. 90-11 dated April 21, 1990, amended by Law No. 22-16 dated July 20, 2022, concerning Labor Law, Official Gazette No. 49.

⁴- Decree No. 76-104 dated December 9, 1976, concerning the Law of Indirect Taxes, amended and supplemented, and Decree No. 76-101 dated December 9, 1976, concerning the Law of Direct Taxes, amended and supplemented by Law 23-22 concerning corrective financial law until 2024.

⁵- Decree No. 03-05 dated July 19, 2003, concerning Copyright and Related Rights, Official Gazette dated July 23, 2003, No. 44.

⁶- Law No. 03-10 dated July 19, 2003, concerning Environmental Protection within Sustainable Development, amended by Law No. 11-20 dated February 7, 2011, Official Gazette No. 09.

It also concerns promoting technology transfer, developing innovation and the knowledge economy, generalizing the use of new technologies, creating job opportunities, enhancing human resource skills, and improving the competitiveness of the national economy and its export capacity.

It is also noteworthy that the law stipulates that the rights and benefits legally acquired by the investor remain protected and are subject to the laws under which they were registered and/or declared until the end of the stated benefits.

2. Importance of Incentives and Guarantees Provided for Investment

Foreign direct investment has emerged as a driving force for growth in the global digital media industry, due to the major transformations it has brought to the communications and media landscape, attracting significant capital, utilizing advanced technologies, and drawing experienced expertise to host countries for this type of investment. According to the Foreign Direct Investment Information Report, the communications and media sector ranked third in new investments between 2019 and 2023, underscoring its importance among all other sectors of foreign direct investment. The flow of investments in the communications and media sector not only encourages innovation but also supports economic development, creates new opportunities, and enhances the competitiveness of media companies worldwide.

The importance of foreign direct investment in digital media can largely be attributed to the COVID-19 pandemic. While most sectors faced a decline in investment, investments in the media and communications sector witnessed an increase. The pandemic accelerated the shift towards digital consumption, heightened demand for digital content, broadcasting services, and online communication platforms. According to data from foreign direct investment markets, the telecommunications sector received the largest share of capital expenditures for foreign direct investment projects in 2023, reaching 679 projects valued at \$79.77 billion, with investment in this sector rising by 24%, highlighting its resilience and growth potential during global uncertainty¹.

Governments offer various incentives to attract foreign investments, including:

- Tax Incentives (Financial and Funding): Investment incentives provided by developing countries to foreign investors are particularly significant when these incentives serve as compensation for the absence of other relative advantages in the host countries. These incentives manifest as financial and funding incentives.

Financial incentives primarily consist of tax incentives, with key forms including temporary tax exemptions, investment tax credits, accelerated depreciation of capital assets, exemptions from customs duties or other import taxes on imported capital goods, as well as export incentives and special incentives applied to encourage investment in free zones for all stages of exports².

Funding incentives mainly include direct government subsidies granted to cover part of the capital cost, production costs, and marketing costs associated with the investment project, government-supported credit, as well as government participation in the ownership of equity in investment projects that involve high commercial risks, government insurance at preferential rates to cover certain types of risks, and fluctuations in exchange rates or non-commercial risks such as nationalization and expropriation³.

¹- Ali Bin Al-Waleed Al-Thani, CEO of the Investment Promotion Agency, Jassim Mohammed Al-Khoori, CEO of the Qatar Media City, "The Role of Foreign Direct Investment in Driving Growth in the Digital Media Industry," [Invest Qatar](<https://www.invest.qa/ar/media-and-events/news-and-articles/how-fdi-is-driving-growth-in-the-digital-media-industry>), August 21, 2024.

²- Article 27 of Law No. 22-18 concerning investment dated July 24, 2022, and its implementing regulations, Official Gazette No. 50.

³- Manour Osrir, University Center of Khemis Miliana, and Alyan Nadir, University of Boumerdes, "Incentives for Private Direct Investment," Journal of North African Economies, No. 2, p. 120.

Ground Incentives: The geographical location of the area in host countries plays a vital role in its success and in the ability to persuade foreigners to invest in it. Many global experiences have shown that the failure of an industrial zone to attract foreign direct investment is often due to the host country's failure to choose the appropriate location for the industrial zone¹. Focusing on Algeria as an example, Algeria, located in North Africa, stands out as an attractive investment destination, offering a unique mix of advantages for entrepreneurs. Key elements contributing to Algeria's increasing significance as an investment destination include its proximity to markets, regional connectivity, potential as a logistics hub, geopolitical stability, natural resources, diverse climatic conditions, regional opportunities, access to new markets, and the possibility of establishing special economic markets.

- **Proximity to Markets:** Algeria's distinctive geographical location provides investors with a promising strategic opportunity. As a bridge between Europe and Africa, companies located in Algeria can effectively serve both European and African markets. This proximity facilitates cross-border trade, reducing logistical costs and opening doors to a wide trade network.

- **Regional Connectivity:** Algerian ports, benefiting from their proximity to the Mediterranean Sea, provide important maritime connections. These ports can serve as access points to international shipping routes, offering companies easy access to global trade and enhancing Algeria's status as a regional and global trade hub.

- **Logistics Hub:** Algeria has the potential to become a major logistics center, especially as a gateway to North Africa. Investors can leverage this strategic location to optimize their supply and distribution chains in the region, creating significant operational efficiencies.

- **Geopolitical Stability:** Compared to some neighboring regions, Algeria has a historically stable geopolitical environment. This stability provides investors with a secure operating environment, reducing political risks and creating a favorable business climate.

- **Natural Resources:** Algeria possesses significant reserves of natural resources, particularly in the hydrocarbons sector. As a strategic energy resource, Algeria attracts investors interested in the renewable energy sector, enhancing its economic status.

- **Climatic Conditions:** The diverse climatic conditions in Algeria offer varied opportunities in sectors such as agriculture, tourism, and renewable energy. Investors can benefit from this diversity to explore different sectors and mitigate risks associated with climate changes.

- **Regional Opportunities:** As a member of the African Union, Algeria can actively participate in projects and initiatives aimed at enhancing economic integration in Africa. This opens doors for investors seeking to capitalize on regional opportunities and contribute to the continent's economic development.

- **Access to New Markets:** Algeria's geographical proximity to Europe is a significant asset for investors looking to access this key market. Favorable trade agreements and historical relations facilitate trade and commerce, creating substantial growth opportunities².

Regulatory Incentives: The existence of legislative and regulatory frameworks governing direct investment activities is one of the most influential factors in attracting foreign investments. For this to be effective, several key elements must be in place:

¹- Ghari Tarek, Mustafawi Ali, Political Economy Laboratory (PEDAA), University of El Oued, Algeria, Journal of Finance and Business Economics, Volume 08, Issue 01, March 2023, University of Shahid Hama Lakhdar, El Oued, Algeria, p. 357.

²- [AAPI](<https://aapi.dz/ar/raisons-dinvestir-en-algerie-ar/>), November 3, 2024, 10:35.

- A unified investment law characterized by clarity, stability, transparency, and non-contradiction with other relevant legislation, aligning with international rules and regulations governing and protecting investment¹.

- Sufficient guarantees to protect investors from specific types of risks such as nationalization, expropriation, imposition of guardianship, and the requirement for compensation. Additionally, there should be provisions for the freedom to transfer profits abroad and for the entry and exit of capital, as well as a system that ensures the protection of intellectual property rights².

- An efficient judiciary capable of enforcing laws and contracts and resolving disputes that arise between the investor and the host state effectively. This is affirmed by Algerian legislation in Articles 11 and 12 of Law No. 22-18, which establishes a Supreme National Commission for Appeals related to investment tasked with adjudicating appeals submitted by investors.

Furthermore, Article 12 of the same law states that any dispute resulting from the application of this law between the foreign investor and the Algerian state, caused by the investor or due to measures taken by the Algerian state against them, shall be subject to the competent Algerian judicial authorities unless there are bilateral or multilateral agreements ratified by the Algerian state concerning reconciliation, mediation, and arbitration.

Foreign direct investment is a crucial factor in driving digital transformation in many countries. However, foreign direct investment is subject to a complex legal framework and carries various risks. To maximize the benefits of foreign direct investment, governments must create an attractive and stable investment environment and establish clear and robust legal frameworks that protect investors' rights.

Third: Crowdfunding in Digital Transformation

Crowdfunding has become one of the most important modern tools for financing projects, especially those related to digital transformation. It represents a new funding model based on pooling small amounts of money from a large number of individuals or institutions to finance a specific project. It is an innovative financing mechanism that serves as an alternative to traditional funding, involving an open invitation for relatively small financial contributions, allowing all segments of society to invest a certain amount of money using financial technology tools. This is achieved through basic criteria: raising small amounts of money from a large number of funders using digital technology and through an online platform³.

In terms of established technical definitions regarding crowdfunding in the field of digital transformation, studies indicate a trend among investors and entrepreneurs to invest their funds via crowdfunding methods, with startups and emerging enterprises being particularly relevant in this domain. This type of funding primarily supports nascent projects that lack the necessary financing.

There are several definitions of crowdfunding, including those issued by global organizations and bodies, arranged chronologically:

- Definition from the World Bank (2013): Crowdfunding is an online means for companies or other entities to raise funds—typically ranging from about \$1,000 to \$1 million—in the form of donations or investments from multiple individuals⁴.

¹- Manour Osrir and Alyan Nadir, Previous Reference, p. 118.

²- Article 09 of Law 22-18.

³- Qasouri Insaf, Financial, Banking, and Business Administration Laboratory, Mohamed Khider University, Biskra, Algeria, "Analytical Study of the Contribution of Modern Alternative Financing Techniques to Enhance Financial Inclusion - A Reference to the Case of Algeria," Journal of Legal and Economic Studies, EISSN 2602-7321/ ISSN Year: 2022 Volume: 20, Issue: 20, p. 441.

⁴- World Bank. (2013). Crowdfunding's Potential for the Developing World. Washington, D.C: World Bank.

- Definition from the Global Partnership for Financial Inclusion (GPFI) (2016): In the context of financial inclusion, crowdfunding refers to a funding method based on market mechanisms, where funds are raised from large numbers of individuals or legal entities in small amounts, bypassing traditional financial intermediaries and using mobile phones and internet-based platforms to connect with borrowers, whether to finance a business project, a specific project, or other needs¹.

- Definition from the European Commission and the European Union for Capital Markets (2016): The term “crowdfunding” refers to an open invitation to the public to raise funds for a specific project through crowdfunding platforms via websites that enable interaction between fundraisers and the public, allowing for financial commitments and collection through the platform².

One of the main reasons contributing to the spread and development of crowdfunding platforms globally is the formalization and regulation of these platforms by establishing legal, legislative, and regulatory frameworks governing their operations to protect investors and various parties involved. A legal and regulatory framework that supports transparency enables the platforms to operate within a safe environment, ensuring the growth of this newly established alternative financing market³.

In this chapter, we will conduct a detailed analysis of the types of crowdfunding and the framework that establishes it in Algeria as a model.

1. Types of Crowdfunding:

A. Donation-Based Crowdfunding Platforms:

The business model of these platforms is based on collecting donations and grants from donors without signing any contracts, aimed at participating in charitable and humanitarian donations to support relief efforts in cases of disasters, famine, and funding educational programs, among others. Platforms like “JustGiving” and “GoFundMe” are among the most important in this field, having raised approximately \$2.9 billion in donations globally in 2015⁴.

B. Reward-Based Crowdfunding Platforms: In this type of crowdfunding, investors receive rewards for their investments, but do not benefit from any financial returns. Rewards may come in the form of a product or service offered by the company as a symbolic gift. Companies strive to provide different types of rewards and incentives to attract and convince investors. This type of crowdfunding is particularly popular due to the intrinsic value of participation in crowdfunding, social reputation, and shared identity⁵. Platforms such as ‘Kickstarter’ and ‘Indiegogo’ are prominent in this category. Since its launch in 2009 until the end of May 2019, Kickstarter has funded 447,000 projects with a total funding amount of approximately \$3.9 billion, with a success rate of about 37% for funded projects (successful projects relative to the total number of projects funded through the platform, including those that succeeded, failed, were canceled, or postponed)⁶.

C. Peer-to-Peer (P2P) Crowdfunding Platforms: P2P crowdfunding platforms are among the fastest-growing crowdfunding platforms. Their business model involves lending money to individuals or companies in exchange for interest. While some platforms exclusively target loans aimed at social

¹- GPFI. (2016). Global Standard-Setting Bodies and Financial Inclusion: The Evolving Landscape. Basel: Global Partnership for Financial Inclusion.

²- European Commission. (2016). Crowdfunding in the EU Capital Markets Union. Brussels: European Commission.

³- Ziegler, T., & Shneor, R. (2020). Lending Crowdfunding: Principles and Market Development. In R. Shneor, L. Zhao, & B.-T. Flåten (Eds.), *Advances in Crowdfunding Research and Practice*. Cham: Palgrave MacMillan, pp. 62-63.

⁴- Hiba Abdel Moneim, Rami Youssef Obeid, "Crowdfunding Platforms: Prospects and Regulatory Frameworks," Secretariat of the Council of Governors of Central Banks and Arab Monetary Institutions, Arab Monetary Fund, Abu Dhabi - UAE, p. 17.

⁵- Melissa. (2017). Crowdfunding as a Financing Resource for Small Businesses. Doctoral Study, College of Management and Technology, Walden University, p. 24.

⁶- [Kickstarter Stats](<https://www.kickstarter.com/help/stats>), visited on June 1, 2019.

objectives, most P2P lending platforms operate as competitive funding channels to traditional financing options through banks and other financial institutions. The **KIVA** platform is significant in this regard, offering small loans ranging from \$100 to \$100,000 to farmers, NGOs, and small to medium-sized enterprises that have a positive impact, while also aiming to support financial inclusion. The platform has provided \$1.30 billion in small loans to approximately 3.2 million borrowers in 78 countries worldwide, with a repayment rate of 97%¹.

D. Equity-Based Crowdfunding Platforms: Through this model, investors receive shares in the company that chooses this type of crowdfunding to increase its capital. Shareholders receive financial returns on their investments and a portion of the profits. It is worth noting that each country has specific regulations governing investments through equity-based crowdfunding platforms².

WeFunder is one of the notable equity-based crowdfunding platforms that has benefited from regulatory trends in the United States aimed at easing previous restrictions on corporate funding and allowing new funding channels since 2016. **StartEngine** is also one of the most important equity-based crowdfunding platforms, facilitating investors in purchasing shares in companies raising amounts up to \$50 million³.

Consequently, there are numerous benefits resulting from crowdfunding for small, medium, and startup enterprises, including the speed of fundraising and its direct impact on driving business growth, which helps companies test the market they will enter in the future, measure demand, and gather customer feedback early on without being under the pressure of an investor or owner. Despite the advantages of crowdfunding, it also carries drawbacks, including potential fraud from fraudulent entrepreneurs, platform failure leading to brand deterioration, and a lack of regulation and exit options⁴.

2. The Crowdfunding System Adopted in Algeria and Its Regulatory Framework

The Algerian state is focusing its attention on the activity of crowdfunding platforms in light of its strategy aimed at encouraging small and medium-sized innovative enterprises, which have become a new pillar of the economy as a crucial component of future development. This is to enhance investments related to innovation, technological advancement, research and development, and the adoption of artificial intelligence applications⁵.

The crowdfunding system was established in 2020 through the Commission of Organizing and Monitoring the Stock Exchange (COSOB). It is a financing system based on participatory investment, allowing the aggregation of funds for startups via online platforms. Crowdfunding is defined in the Official Gazette of the Algerian Republic No. 33, according to Article 45 of the Supplementary Finance Law 2020⁶, as: "Investing the public's funds online in contributory investment projects." It involves companies created specifically for this purpose acting as advisors in the field of participatory investment, as well as licensed intermediaries for the approved stock exchange operations to advise on the investment of transferable securities and financial products, as well as investment fund management companies. COSOB is also responsible for preparing a list that defines the conditions for licensing, practicing, and monitoring participatory investment advisors and managing public

¹- [Kiva](<http://www.Kiva.org>), visited on June 1, 2019.

²- Usha. (2014). Crowd Funding For Startups in India. IOSR Journal of Business and Management, p. 51.

³- UNDP. (2019). "Crowdfunding," Financing Solutions for Sustainable Development, June, p. 1, available at: [UNDP](https://www.undp.org/content/dam/sdfinance/doc/Crowdfunding%20_%20UNDP.pdf).

⁴- Zawaid Lzihari, Marsli Nazeera, "The Role of Crowdfunding Platforms in Financing Startup Projects in Saudi Arabia and the UAE with Reference to the Case of Algeria," Journal of Economic and Administrative Studies, University Center of Aflo, Algeria, Volume 04, Issue 01, 2022, p. 145.

⁵- Qasouri Insaf, Previous Reference, p. 448.

⁶- Article 45 of the Supplementary Law for the Year 2020, Official Gazette No. 33.

investment platforms online based on participation in investment projects¹. The establishment of these platforms is accompanied by a tax exemption system for startups and the launch of a fund dedicated to financing the pre-execution phase of their projects, as confirmed by Article 05 of the Official Gazette No. 68 for the year 2023².

While Algeria is used as an example in this field, it is important to note that crowdfunding activity in Algeria is still in the establishment phase, with proposals and legal and regulatory frameworks being developed. This does not prevent the existence of some platforms, notably “Chriky” and “Twiiiza,” which provide simple lending services for certain social projects and entrepreneurs to develop their innovations and small to medium-sized projects.

A. The Algerian Platform “Chriky”

Chriky is the first equity-based crowdfunding platform in Algeria. It is a limited liability company established in 2014 with a capital of 100,000 DZD, headquartered at 01 Ali Cherif Street - El Madania - Algeria. However, it operates in France due to the burdensome and numerous legal restrictions in Algeria³.

This platform was created by young Franco-Algerians in 2020 during the global health crisis and is managed by businessman Nacim Sebti. Its purpose is to provide funding for young entrepreneurs to overcome the constraints faced by project owners under the traditional financing system in Algeria. Currently, the site offers 15 projects in categories such as tourism, music, entrepreneurship, beauty, and technology⁴.

It is a crowdfunding platform that serves as a connection between internet users, represented by entrepreneurs or startups or projects on one side, and investors seeking returns on the other.

Regarding the services provided by the “Chriky” platform for startups, it offers several services through its official website, with the most important services being:

- The platform provides support, assistance, and advice in management for entrepreneurial project owners and startups.
- The Chriky team acts as an intermediary between investor shareholders and entrepreneurs until the company is established or its capital is increased.
- The platform allows startups to present their projects and find funding from investors, as well as to choose among entrepreneurial projects to increase their returns⁵.

B. The Crowdfunding Platform “Twiiiza”

The website twiza.com was co-founded in July 2013 by Karim Mansoura and Nadhir Alam. It represents the first Algerian crowdfunding platform, aiming to finance artistic, solidarity, sports, and entrepreneurial projects, as well as environmental initiatives.

¹- Sakhri Abdel Wahab, "Towards Enhancing Financing for Small and Medium Enterprises through Crowdfunding and Peer-to-Peer Lending," *North African Economies*, Algeria, March 2000, p. 222.

²- Decision dated September 4, 2023, approving the organization and monitoring of stock exchange operations No. 23-01 dated April 12, 2023, which sets the conditions for the accreditation and practice of advisors in the field of contributory investment and their monitoring, Official Gazette No. 68, dated October 25, 2023, p. 14.

³- Official website of the "Chirky" platform: [Chirky](<http://www.chriky.com>).

⁴- Shawqi Jabari, Zahira Qat Arni, "Crowdfunding as an Innovative Mechanism to Address the Funding Dilemma for Companies," *Journal of Economic and Administrative Studies*, Algeria, December 2022, p. 81.

⁵- Marabet Abdel Jalil, Abdel Hadi Mukhtar, "Crowdfunding Platforms as an Innovative Mechanism for Financing Emerging Institutions in Algeria with Reference to the Case of Chirky Platform," *Contemporary Economic and Commercial Studies*, Volume 07, Issue 02, 2024, p. 325.

The idea of creating this platform came to the partners through the 2012 challenge, which was themed “Challenge Nrouhou.” They met many active associations and young talents full of ideas and ambitions who struggled to find support for their projects. Thus, they wanted to offer a solution to finance good ideas with the help of internet users. The name they chose for the platform, “Twiza,” is not random; it is derived from a strong term used in Algeria that embodies the spirit and values of ancestors based on mutual assistance, solidarity, and empathy. They believed this could be a powerful motivator for interaction and raise awareness to propel the platform toward a broader international dimension¹.

The goal of the “Twiza” platform is to be able to execute Algerian projects that find financial resources through traditional channels. The platform employs a donation model with symbolic returns, as its founders see that in a country with an area of over 2 million square kilometers, it is only natural that thousands of project ideas are born every day, many of which may remain just ideas due to a lack of funding.

Currently, the website features 22 projects in the categories of solidarity, art, heritage, education, music, entrepreneurship, sports, adventure, technology, and video games, with the majority being 5 projects in entrepreneurship and 7 projects in technology².

Thus, crowdfunding is a powerful tool for financing projects, particularly small and medium-sized enterprises, and it is expected to witness accelerated growth in the coming years, with the development of legal frameworks and increased awareness of the importance of this type of funding. However, it faces several legal challenges that must be addressed to develop this sector, including:

- Insufficient legal and regulatory frameworks governing the operation of crowdfunding platforms and providing adequate protection for participants, whether they are funders or borrowers, as well as dispute resolution mechanisms among them, which negatively affects the growth of these platforms.
- Limited access to technology due to weak digital infrastructure, low internet penetration rates, limited bandwidth, and high costs.
- Weak adoption and spread of electronic payment systems, as the operation of crowdfunding platforms relies on the use of electronic payment tools.
- A lack of awareness and trust in innovative methods, as crowdfunding platforms represent a recent phenomenon in many markets, leading to limited awareness among potential users (funders and borrowers), which reduces trust in engaging with them³.

II. AN EXAMINATION OF DIGITAL READINESS INDICATORS AND GLOBAL INTEGRATION

In a transforming, changing, and rapidly evolving world saturated with information and communication technologies, it is essential to address the digital readiness of international governments by examining its indicators, based on international and national reports and their implications for digital transformation and its overall impact on governments, as well as its reflections on enhancing public services and their quality.

What supports the discussion of digital transformation globally, including in Algeria, is the package of measures and decisions taken by the international community and the Algerian government aimed at

¹- Basha Najat, Dabbah Mohamed Reda, "Crowdfunding as an Innovative Mechanism for Financing Emerging Institutions through Crowdfunding Platforms: The Twiza Model," International Conference: Incubators for Emerging Institutions in the Digital Economy - A Review of Opportunities and Challenges, University of Adrar, Algeria, 2021, p. 83.

²- Zawaidi Lzihari, Marsli Nazeera, Previous Reference, p. 158.

³- Abdel Aziz Salah al-Din, Ashouri Badr al-Din, "Crowdfunding Platforms as a Promising Alternative for Financing Emerging and Small and Medium Enterprises: A Case Study of the Algerian Chirky Platform," Journal of Economic and Administrative Studies, University Center of Aflo, Algeria, Volume 05, Issue 01, June 2023, p. 12.

establishing the concept of e-government since the beginning of the millennium within the framework of future visions. This will be studied in detail in the following two sections:

First: The Duality of Government E-Readiness and Its Intersection with the Necessities of Digital Transformation

The digital transformation of government institutions in countries is a comprehensive, crucial, and practical strategy aimed at enabling and accelerating business and services efficiently and effectively¹. Among these services is the streamlining of public service delivery, commonly referred to as e-government or smart government², as well as swift justice, which is a primary priority in most countries worldwide. Many nations have moved towards digitizing legal procedures and holding court sessions remotely. Most countries, including Algeria³, have adopted the digital transformation project for all state institutions, including the judiciary⁴. Digital transformation aims to shift from the traditional system, which is often slow and complex, to a digital system that utilizes digitization to organize the judicial system. This shift reflects the achievement of rapid justice through a set of simple procedures, and new terms have emerged that are unfamiliar in the judicial environment, such as “digital justice” and “virtual courts,”⁵ which are currently among the most commonly discussed terms in the judiciary.

1. E-Readiness of the Emirati Government

The United Arab Emirates is one of the first Arab countries to work on developing its justice system. The Emirati government has modernized the justice system using modern digital technologies in the judiciary to achieve the state’s strategic goals for digital transformation of all transactions⁶. The digital court represents one of the strategies of the judiciary sector within the general strategy for 2020 adopted by the UAE. Dubai Courts launched a package of visual communication services (remote marriage, amicable dispute resolution, Labor Court Compatibility Center). Additionally, the “Wayak” service was launched to respond to inquiries and comments from users through an electronic application, as well as the launch of the digital justice platform, which includes services for registering cases, settling disputes, hearing witnesses, and deliberating and adjudicating criminal cases⁷.

¹- Digital Economy and Society Index 2021: Overall progress in digital transition but need for new EU-wide efforts [European Commission](https://ec.europa.eu/commission/presscorner/detail/en/ip_21_5481).

²- "Digital Economy Report," an annual report reviewing the state of digital readiness in countries, United Nations Conference on Trade and Development (UNCTAD). [UNCTAD](<https://unctad.org/>).

³- Patricia J. Pascual: Conference on e-government, e-ASEAN task force, May 2003, UNDP-APDIP-p4, Available at: [APDIP](<http://www.en.apdip.net.pdf>).

⁴- Ali Lotfi, "E-Government Between Theory and Practical Application," Sixth Conference on E-Government "New Public Administration and E-Government," organized by the Arab Organization for Administrative Development, League of Arab States, Dubai, UAE, held from December 9-12, 2007, p. 8.

⁵- The concept of e-government first appeared in the United States as part of the "Reinventing Government" program, which advocated for expanding the use of modern technologies in providing public services, especially those affecting a large number of citizens. Abdul Aziz Abdullah Al-Ruqabi, "E-Government and Its Role in Providing Public Services in the Kingdom of Saudi Arabia," Master's Thesis, Faculty of Economics and Political Science, Cairo University, 2002, p. 18.

⁶- Ridwan Kheir al-Din, "Digital Transformation and Artificial Intelligence in Algeria: A Driver for Economic Dynamics and Unprecedented Innovation," published on August 28, 2024, available at: [Internews](<https://www.internews.dz/>).

⁷- Marco Velicogana, European Commission for the Efficiency of Justice, "Utilization of Information and Communication Technologies in European Judicial Systems," 2007, p. 36: on the site: [COE](www.coe.int/t/dghi/cooperation/cepei/series/Etudes7TICfr.pdf).



2. E-Readiness of the British and French Governments

Britain implemented digital litigation in 2009, which has been developed in the UK over the past four years with the assistance of HMCTS, a company specialized in the development of courts and judicial bodies under the Ministry of Justice¹.

In France, the transition to electronic management of public facilities was a response to a firm political and governmental will, closely related to the state's ambition and desire for reform and administrative development. This was expressed by the French Prime Minister in 1996, stating that the ministry's priority was to enhance informatics in the administrative field. This was integrated into the government's activity program to introduce France into the world of informatics, which was adopted by the first inter-ministerial committee on January 16, 1998, under the title of developing the administration, digitizing administrative procedures, and enhancing remote procedures. This program was implemented in four phases².

The French legislator made certain amendments to the laws, including the French Code of Civil Procedure, where Article 748 included provisions for the use of digital technology in judicial announcements and the submission of briefs, reports, and notifications in digital format.

3. E-Readiness of the Algerian Government

In Algeria, the efforts made in this area have led to the establishment and development of an internal communication network connecting the central administration with all central and decentralized entities, including judicial institutions and correctional facilities, as well as organizations under supervision, via an optical fiber network. This serves as essential infrastructure and a physical base necessary for utilizing various information systems developed by the sector's competencies³.

A. Towards Implementing Digital Justice

The adoption of electronic certification and digital signatures in the judicial field, according to Law No. 15-03, dated February 1, 2015, related to modernizing justice, has led to the establishment of a center for personalizing electronic signatures and the creation of an electronic certification authority. This allows all stakeholders in the sector to affix reliable electronic signatures to administrative documents and judicial records, with the aim of providing remote judicial services.

- Citizens are enabled to obtain the extract No. 03 for the criminal record and the nationality certificate, electronically signed, online.
- The Algerian diaspora abroad can obtain an electronically signed nationality certificate through diplomatic or consular representations.
- Algerians abroad and foreigners who previously resided in Algeria can obtain the extract No. 03 for the criminal record, electronically signed, through diplomatic or consular representations.
- Lawyers can withdraw regular copies of electronically signed judicial rulings and decisions online.
- The service for withdrawing regular copies of decisions issued by the Supreme Court and the Council of State, electronically signed, is available starting from the judicial councils, without needing to travel to the issuing judicial body.
- An electronic correction service for errors in civil status records is provided, allowing citizens to submit correction requests and accompanying documents online or at the nearest court or municipality, as well as at diplomatic or consular representations abroad.

¹- Safaa Outani, "The Electronic Court: Concept and Application," *Journal of Damascus University for Economic and Legal Sciences*, Volume 28, Issue 1, 2012, p. 170.

²- Mahmoud Ashraf, "Electronic Courts in Light of Contemporary Procedural Reality," *Journal of Sharia and Law*, Part 3, Issue 35, 2020, p. 75 and following.

³- UAE Federal Law No. 2 of 2017 concerning remote communication in criminal proceedings.



- Efforts continue to digitize the judicial file at all stages, including the electronic exchange of petitions outside sessions.
- The possibility of tracking case outcomes and accessing the ruling text via the Ministry of Justice's electronic portal is provided.
- Electronic addresses have been opened for citizens to benefit from remote judicial services, along with a service for verifying the validity of electronically signed judicial documents withdrawn online.
- A call center has been established under the justice sector to address citizens' and litigants' concerns and respond to their inquiries related to judicial and legal matters.
- Various public administrations and entities can access and withdraw the criminal record (extract No. 2), electronically signed.
- Collection methods are improved through the adoption of an automated integrated system and a national database for collecting fines and judicial expenses by judicial authorities, along with incentives for implementing judicial rulings, enabling those concerned to benefit from an installment payment system and a reduction in due amounts in cases of voluntary payment¹.

B. Establishment of an E-Learning Platform

The establishment of the electronic prosecution platform "e-nyaba" aims to enable individuals and entities (administrations, institutions, private companies, associations, etc.) to submit complaints or petitions to the prosecution remotely.

- Citizens will be able to register to benefit from the service of obtaining an electronic copy of their criminal record (extract No. 3), whether they are convicted or not.
- A "National Electronic Counter" will be established, allowing litigants and their lawyers to access case outcomes and rulings, and obtain regular copies of judicial decisions (both regular and administrative) from any judicial body across the country, thus sparing them the hassle of traveling to the issuing judicial office, along with the associated effort, expenses, and time loss. The services of this counter will also be expanded to include older judicial rulings archived.
- A digital platform will be created for submitting requests and obtaining permission to communicate with prisoners electronically online.
- A portal for Algerian law and judicial jurisprudence will be established, containing decisions from the Supreme Court and the Council of State, in addition to some legislative and regulatory texts, with the aim of promoting Algerian law at both local and international levels and benefiting scientific research in legal fields, particularly judicial decisions related to commerce and the business climate.

Creation of Two Spaces on the Official Website of the Ministry of Justice:

- "Concerns": This space will receive citizens' impressions, aspirations, and concerns remotely regarding various services of the justice facility.
- "Suggestions": This space will receive citizens' proposals and contributions remotely regarding the improvement of the quality of services provided by the justice facility.

C. Adoption of a Central Information System for Automated Processing of Judicial Activity Data:

- A unified and secure information system specific to the sector will be established to ensure consistency and compatibility of data to facilitate its utilization and avoid data duplication.
- The use of video conferencing technology in organizing remote trials at both national and international levels has significantly contributed to facilitating judicial procedures and speeding up

¹- Veronica Bradautanu, "From Digital Transformation: A Case for Online Courts in Commercial Disputes," European Bank, London, England, 2020, p. 14.

the resolution of cases by allowing remote hearings of witnesses, parties, and experts, while avoiding the transfer of prisoners. This technology is also used to organize work sessions, lectures, and training courses.

D. Development of Judicial Administration Management Methods

- An electronic management system for administrative and judicial documents, as well as civil status records maintained at the judicial councils, will be adopted to optimize the sector's archive and contribute to the realization of e-administration.
- Documents will be sent and information exchanged using the internal email system of the sector.
- An electronic mechanism for sending expert reports and exchanging documents electronically between judicial authorities and the scientific departments of law enforcement will be established.
- An electronic mechanism for sending judicial documents and procedures will be adopted to enable judicial authorities to send summons electronically instead of using traditional legal methods, and to inform the litigant about the status of their case and various relevant information via SMS.

Establishment of a Central Genetic Fingerprinting Unit

- This unit will be managed by a judge assisted by a technical cell overseeing the creation and management of a national database for genetic fingerprints¹.
- A biometric information system will be established, utilizing biometric fingerprint characteristics and a national biometric database to include all fingerprints of individuals under judicial proceedings and inmates in correctional institutions. This aims to contribute to identity recognition in a timely manner, enhance flexibility and speed in judicial procedures, facilitate the management of correctional institutions, and prevent instances of identity fraud².

Second: Strengthening Cybersecurity within Digital Transformation

The integration of cybersecurity is essential to ensure business continuity in a secure and sustainable environment. Each complements the other in achieving digital growth, but the digital transformation in cyberspace requires skilled and trained forces. The lack of training and qualification programs in advanced technology fields poses a major challenge. Cybersecurity encompasses the security measures that may be taken to defend information systems against cyber attacks³. The complexity and frequency of cyber attacks are steadily increasing, prompting most advanced countries recently to enhance the resilience of their infrastructure and establish a culture that emphasizes cybersecurity

¹- The first phase involves enabling users to obtain administrative forms via the internet by downloading them to their computer, printing them, filling them out by hand, and sending them by regular mail. The second phase involves allowing users to fill out the downloaded forms electronically and send them by regular mail. The third phase allows users to send filled forms electronically to the administration via email. The fourth phase fully transforms all procedures into a non-material form, enabling users to provide information related to their requests through an online form and receive a confirmation message and a file number from the administration to track their application status online. For more details, refer to Dr. Moussa Mustafa Shahada: "E-Government and Its Applicability in Filing Complaints Before Administrative Courts via Email," *Journal of Legal and Economic Research*, Alexandria, Issue 1, 2010, p. 548 and following.

²- [MJustice](<https://www.mjustice.dz>)

³- According to the provisions of Law No. 16-03, dated June 19, 2016, concerning the use of genetic fingerprinting in judicial procedures and identification of individuals, to ensure legal protection of genetic data preserved at its level.

in both the private and public sectors¹. They have worked to protect their critical infrastructure, as compromising it could pose serious security, economic, and health risks².

The primary goal behind the emergence of cybersecurity is the rise of what are known as severe digital attacks or resilient viruses, where individuals³ or organizations' digital systems are targeted, leading to control over sensitive data, extortion, theft, and deliberate destruction of information⁴.

As a result of the significant losses caused by these attacks, cybersecurity emerged not only to defend against harmful computer attacks but also to conduct proactive measures to discover vulnerabilities in the system and address them immediately upon discovery.

Cybersecurity is often associated with interconnected terms such as cybercrime and cyber attacks, which involve illegal planning using digital technology to control an individual's or institution's device or system⁵, utilizing advanced devices or exploiting system vulnerabilities, or relying on user ignorance and a lack of technological awareness⁶.

1. Aspects of Cybersecurity

Achieving cybersecurity is an ongoing challenge due to the evolving nature of cyber threats. Aspects of cybersecurity include:

- Securing Systems and Networks: This involves providing protection for devices and networks against cyber attacks, such as viruses, ransomware, and malicious attacks.
- Identity and Access Management: This includes regulating and managing access to systems and information to ensure that access is granted only to authorized individuals.
- Threat Analysis and Response: This encompasses monitoring and analyzing cyber activities to detect potential security threats and taking necessary measures to counter them.
- Training and Awareness: This involves educating users and technical staff about cybersecurity risks and how to prevent them.

¹- Murebai Sawsan, "Human Development in Algeria - Reality and Prospects," Master's Thesis in Management Sciences, University of Mentouri 02, 2012-2013, p. 166.


²- Cybersecurity is crucial due to the high financial costs allocated to repel various types of cyber attacks, with the average budget spent on countering attacks being \$17 million.

³- Phishing attacks: Fake emails appear to come from a trusted source, such as a company or financial institution, aiming to deceive users into opening attachments or clicking on harmful links. Malware attacks: Programs designed to damage systems or steal data, usually transmitted through infected files or harmful links. Denial of Service (DoS) attacks: Attempts to disrupt access to a system or network by overwhelming it with traffic, making it unable to handle legitimate traffic. Data breach attacks: Attempts to access sensitive data, such as customer or employee information, typically using phishing, malware, or social engineering techniques.

⁴- Recently, the world has witnessed a series of cyberattacks targeting major companies and entire governments. For example, in February, a massive cyberattack on Change Healthcare, claimed by the Russian hacker group Blackcat, caused chaos in the US healthcare system, leading to shutdowns of technical systems in various pharmacies and hospitals, costing the company a ransom of \$22 million. Nevertheless, sensitive patient health data was leaked. Article published on the following Algerian site: [HIS](<https://his.edu.dz>).

⁵- Cybercrime fundamentally consists of organized attacks that manipulate the victim's digital system and take complete control over it, known as cyberattacks. To protect the victim from these attacks, what is known as a cyber shield must be implemented. The cyber shield is defined as an effective firewall activated on the digital system, aimed at quickly detecting any vulnerabilities that could allow a serious cyberattack, enabling individuals or institutions to eventually browse the digital world freely without fear of exploitation or surveillance of their information, known as freedom of movement in cyberspace.

⁶- The Arab Organization for Communication and Information Technology, Third International Conference on Information Security and Cybersecurity (CAISEC 24) "Cyber & Information Security Exhibition & Conference," June 3-4, 2024, available at: [AICTO](<https://www.aicto.org/ar>).

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- Policy and Procedure Development: This includes establishing policies and procedures within organizations to enhance cybersecurity and ensuring their implementation.
 - Compliance Assurance: This relates to ensuring that systems and processes comply with cybersecurity laws and regulations.
 - Response Preparedness: This involves developing strategies and plans for rapid response in the event of cyber attacks or security breaches.

2. Types of Cybersecurity

Cybersecurity types encompass a range of procedures and techniques used to protect digital systems and information from cyber threats. Here are some key types:

- Network Security: This involves protecting digital networks and ensuring the integrity of data transmitted and received across networks. It includes the use of firewalls and intrusion detection systems.
- Endpoint Security: This focuses on protecting individual devices (such as computers and smartphones) and ensuring the security of the software and data stored on them. Solutions for endpoint security include antivirus software and anti-malware programs.
- Application Security: This centers on protecting software applications from threats. It includes vulnerability scanning and improving the security of data handling and communications.
- Data Security: This pertains to protecting data from leakage or unauthorized access. It encompasses data encryption, access rights management, and data loss prevention techniques.
- Identity Security: This focuses on achieving secure identity verification and effective access management. It involves the use of two-factor authentication and identity management systems.
- Cloud Security: This relates to protecting data, applications, and services hosted on cloud computing. It includes ensuring data integrity and securing access to cloud services.
- Computing Security: This involves securing computing devices and resources and protecting them from potential attacks, whether at the physical device level or the computing infrastructure level.
- Communication Security: This focuses on securing communications over networks, whether wired or wireless. It includes data encryption and the use of secure protocols to ensure communication operations.
- Web Security: This concerns protecting websites and web applications from cyber attacks, such as injection attacks and Cross-Site Scripting (XSS) attacks.
- Industrial Control Systems Security: This focuses on protecting industrial control and automation systems, such as SCADA systems, from cyber threats.

3. The Reality of Digital Transformation and Cybersecurity:

By adopting digital transformation and utilizing ICT in various international and national institutions, numerous benefits are achieved, including improved operational efficiency, automation of processes, enhancement of integrated digital services, financial inclusion, blended education, and more, provided these efforts occur in a secure environment. This can only be realized through a combination of encrypted technologies, continuous updates, and legal and security awareness.

A. Digital Transformation and Cybersecurity in Algeria:

Algeria has become capable of keeping pace with the rapid technological advancements witnessed globally¹. Algerian institutions and electronic sectors are no longer solely dependent on importing technology from abroad; they have developed their own technologies, thereby enhancing the independence of national infrastructure and placing Algeria on the global innovation map.

The impact of digital transformation extends beyond a single sector; it encompasses the daily lives of Algerian citizens. Thousands of smart applications have emerged, facilitating people's lives in various fields, from banking and electronic payments to healthcare², education³, and even online shopping⁴.

However, in light of the increasing cyber attacks worldwide, Algeria has also begun taking significant steps to enhance the cybersecurity of its sectors. These steps are part of a national strategy aimed at building a robust cybersecurity infrastructure. Among these notable steps is the opening of a new school specialized in cybersecurity, aiming to meet the growing demand for experts in this field and providing advanced educational programs covering the latest technologies and protection methods⁵. This development reflects Algeria's commitment to strengthening its capabilities in the face of cyber threats⁶.

1. Algerian Legislative Escalation to Prevent Digital Criminality

The first step taken by the Algerian government to confront what is known as cybercrime, particularly crimes related to information and communication⁷, was the issuance of Law No. 09-04 dated August 5, 2009⁸, which includes special rules for preventing and combating crimes related to information and communication technologies. Additionally, amendments were made to the Algerian⁹ Code of Criminal Procedure, as well as the Postal and Electronic Communications¹⁰ Law and the Penal Code, introduced by Law 04/05, adding a seventh chapter regarding the infringement of automated data processing systems from Article 394 bis to Article 394 bis.

2. Algeria has several structures specifically designed to combat cybercrime, primarily including:

¹- Mena Makmal, "Which Economies Top the United Nations E-Government Development Index?" dated April 20, 2023, available at: [WIPO](https://www.wipo.int/global_innovation_index/ar/gii-insights-blog/2023).

²- Law No. 04-02: Concerning currency and credit, which regulates banking operations, including the establishment of banks and financial transactions, amended by Law 23-09 dated June 21, 2023.

³- Law No. 18-05: Concerning electronic commerce in Algeria, which regulates electronic payment and defines the rights and obligations of parties in electronic payment transactions, as well as Decree 19-89 dated March 5, 2019, which specifies how to maintain records of electronic commercial transactions and send them to the National Commercial Register Center.

⁴- Law No. 08-16 concerning health, defining patients' rights and the obligations of health institutions, amended by Law 23-05 dated May 7, 2023, Official Gazette No. 32.

⁵- Economic expert Dr. Murad Bouhenia sees that "digital transformation and artificial intelligence play a pivotal role in reshaping the Algerian economy; this new dynamic is not just a passing phenomenon but an indicator of a real transformation in the structure of the national economy."

⁶- Presidential Decree 24-181 establishing a National High School of Cybersecurity, contributing to the national effort for scientific research and technological development in information systems security and providing innovative high-tech solutions.

⁷- [MFEP](<https://www.mfep.gov.dz>).

⁸- Cybercrime: Over 1,100 cases addressed in 2018 at the national level [APS](<http://www.aps.dz/ar/sante-science-technologie/63173-1100-2018>).

⁹- Law No. 09-04 dated August 5, 2009, includes specific rules for preventing and combating crimes related to information and communication technology, Official Gazette No. 47.

¹⁰- Decree No. 15-02 dated July 23, 2015, amending and supplementing Decree No. 66-155 dated June 8, 1966, which includes the Code of Criminal Procedure, Official Gazette No. 40, amended and supplemented by Law 19-10 dated December 11, 2019, Official Gazette No. 78.

- The National Authority for Preventing Crimes Related to Information and Communication Technology¹.
- The Specialized Judicial Pole for Criminal Cases².
- The National Criminal Pole for Combating Crimes Related to Information and Communication Technologies³.

B. Digital Transformation and Cybersecurity in Saudi Arabia

Cybersecurity is one of the fundamental pillars of Saudi Vision 2030, which relies on digitization and digital transformation across all sectors. Cybersecurity is essential to protect the kingdom's digital infrastructure from cyber attacks that could result in significant economic and social losses.

- Protection of Sensitive Data: Many sectors in the kingdom rely on sensitive data, such as personal and financial information. Cybersecurity is crucial for safeguarding this data from unauthorized access or theft.
- Ensuring Business Continuity: Cyber attacks can disrupt or even halt business operations. Cybersecurity is vital to ensure business continuity, even in the event of a cyber attack.
- Attracting Foreign Investment: The kingdom aims to attract foreign investments, and cybersecurity is one of the critical factors that attract foreign investors.

Saudi Arabia aims to achieve cybersecurity through the implementation of several initiatives, including:

- Developing a National Cybersecurity Strategy The national cybersecurity strategy was launched in 2020 and includes a range of initiatives to enhance cybersecurity in the kingdom.
- Establishing the National Cybersecurity Authority: The National Cybersecurity Authority was created in 2017, aiming to develop and implement policies, standards, and procedures necessary to protect the Saudi cyberspace.
- Raising Cybersecurity Awareness: The kingdom seeks to enhance cybersecurity awareness among individuals and entities through awareness campaigns and training.

Saudi Arabia is committed to achieving cybersecurity, which is considered one of the fundamental pillars of Saudi Vision 2030.

C. Digital Transformation and Cybersecurity in France

Strengthening strategic stability and French security in cyberspace is a significant priority. The French cybersecurity strategy is designed to develop cyber defense policies and support the digital transformation of French society, as well as promote European digital strategic independence. The risks and threats of cyber attacks in France have escalated from networks supporting conspiracy

¹- Law No. 03-2000 on postal and telecommunications, dated August 5, 2000.

²- Establishment of the National Authority for the Prevention and Combat of Crimes Related to Information and Communication Technologies, as previously stated in Law No. 09/04 dated August 5, 2009, which includes specific rules for preventing and combating crimes related to information and communication technologies. See: Presidential Decree No. 261-15 dated 24 Dhu al-Hijjah 1436 AH / October 8, 2015, which specifies the composition, organization, and operational procedures of the National Authority for the Prevention and Combat of Crimes Related to Information and Communication Technologies.

³- According to Articles 37, 329, and 40 of the Code of Criminal Procedure, and under Article 2 of Decree No. 21-11: the first book of Decree No. 66-155 dated 18 Safar 1386 AH (June 8, 1966) is supplemented by a sixth chapter titled "National Judicial Pole for Combating Crimes Related to Information and Communication Technologies."

theories and hackers working for foreign states, disrupting infrastructure and causing numerous crises¹.

The French government has allocated €1.6 billion for cyber defense during the period from 2019 to 2025, aiming to recruit 1,000 cyber warriors by 2025. On May 23, 2023, the Minister of Communications and Digital Transformation in France presented a bill aimed at “protecting and regulating” the digital space. This bill is likely to be added to a series of other laws in this field that attempt to adapt to the transformations and challenges imposed by a virtual space that has not taken a definitive form, complicating the situation further.

The French government is working on a new project to facilitate and expedite the blocking process and intends to target platforms and media sites that promote rumors or seek to mislead public opinion with false information. The bill stipulates expanding the powers of the regulatory authority for visual and digital media, enabling it to prevent any misleading content that contradicts European regulations².

The Paris Call for Trust and Security in Cyberspace, held on November 12, 2018, urged all stakeholders to work together to address the new threats that endanger citizens’ lives and infrastructure. This initiative revolves around nine shared principles that represent opportunities to propose ideas and take appropriate actions. The Paris Call today represents the broadest multilateral initiative in the field of cybersecurity, supported by over 1,200 stakeholders from all continents, emerging from the public and private sectors as well as civil society. Among the supporting entities are 80 countries, more than 700 facilities and professional associations, and over 390 civil society organizations, along with a range of public authorities and local administrations. The supporting entities commit to working together to implement the principles of the Paris Call and to follow responsible behavior in cyberspace.

The Dinar Declaration regarding the initiative on cybersecurity standards falls within the context of the Paris Call. It also includes the core principles and objectives of the G7 countries’ initiative to implement agreed standards and recommendations at the United Nations level, summarize lessons learned and best practices, and lay the groundwork for self-regulatory mechanisms³.

At the G20 summit, France raised the issue of private sector stakeholders taking responsibility. Based on this initiative, the Osaka Declaration recognized the importance of enhancing security in the

¹- Article 211 bis 22: A National Judicial Pole specialized in monitoring and investigating crimes related to information and communication technologies and associated crimes is established at the court of the Council of Justice of Algeria. It also has the authority to adjudicate crimes specified in this chapter if they constitute misdemeanors. Article 211 bis 23 grants extensive powers for monitoring and investigation to the judicial police, stating: The public prosecutor at the National Judicial Pole for Combating Crimes Related to Information and Communication Technologies, as well as the investigating judge and the head of the same pole, exercise their powers throughout the national territory.

²- 25% of French companies were affected by ransomware in 2020, and on July 7, 2023, a Senate investigative committee harshly criticized the video-sharing app “TikTok,” calling for its complete shutdown in France for security reasons. The committee emphasized that the government should act without hesitation to ban “TikTok” for employees in 12 sensitive sectors: state, military, justice, energy, transportation, water management, health, nutrition, finance, communications, industry, and space. The risk of foreign infiltration from conspiracy theorists or anti-vaccine activists or far-right networks active in France has increased.

³- 25% of French companies were affected by ransomware in 2020, and on July 7, 2023, a Senate investigative committee harshly criticized the video-sharing app “TikTok,” calling for its complete shutdown in France for security reasons. The committee emphasized that the government should act without hesitation to ban “TikTok” for employees in 12 sensitive sectors: state, military, justice, energy, transportation, water management, health, nutrition, finance, communications, industry, and space. The risk of foreign infiltration from conspiracy theorists or anti-vaccine activists or far-right networks active in France has increased.

digital economy, addressing some gaps, and tackling vulnerabilities in cybersecurity. The Saudi presidency announced in 2020 that the resilience of cyberspace would be one of its five priorities.

The Global Forum on Cybersecurity for Economic Prosperity has been held within the Organization for Economic Cooperation and Development (OECD) since 2018, driven by France. This forum provides an opportunity to advance France's positions regarding the responsibility of private sector stakeholders for security and stability in cyberspace.

In the Organization for Security and Cooperation in Europe (OSCE), discussions have been ongoing since 2012 within an informal working group comprising experts from participating states. This organization accomplishes significant work in establishing and implementing confidence-building measures applied in cyberspace.

In parallel, France is:

- Establishing strategic bilateral dialogues in the field of cybersecurity with its key partners. These meetings provide an opportunity to identify points of convergence in perspectives that should be highlighted in multilateral forums and to build general trust. The dialogues also pave the way for making appropriate decisions regarding the implementation of technical cooperation programs.
- Implementing bilateral cooperation programs managed by the National Agency for Information System Security, along with some foreign partners, aimed at sharing expertise and best practices on technical subjects, such as threat analysis methods, information sharing, problem resolution, protecting critical infrastructure, and ensuring the security of major events. The Ministry of Justice and the Ministry of the Interior also conduct bilateral cooperation programs between intelligence and judicial agencies addressing cybercrime issues.

CONCLUSION:

It can be said as a conclusion to the study that digital transformation represents a fundamental step for smart governments towards developing public services and achieving sustainable development. Digital transformation mechanisms allow for improved efficiency and the provision of innovative services that meet citizens' aspirations and enhance governmental transparency. However, the success or failure of these transformations depends on the availability of robust technical infrastructure and the commitment to a legal and security framework that protects data and supports transparency and accountability.

Global experiences show that success indicators, such as digital interaction, efficiency, and accessibility, require a comprehensive effort from the government to ensure that digital services are inclusive for all and to develop digital competencies among individuals.

Thus, digital transformation becomes more than just the adoption of technology; it is a comprehensive process that requires a clear strategic vision and ongoing collaboration among various frameworks to achieve a sustainable impact that enhances community welfare and improves the quality of life.

Some Recommendations to Enhance Digital Transformation Mechanisms in Smart Governments and Achieve Targeted Success Indicators:

1. Develop a Comprehensive Legal Framework: Establish clear laws and policies that regulate digital transformation in smart government, covering personal data protection, enhancing transparency, and adherence to cybersecurity standards. These laws should be flexible enough to keep pace with technological innovation without compromising individual security.
2. Enhance Privacy and Data Protection: Emphasize the need for legislation to protect citizens' personal data privacy within governmental digital systems, ensuring secure storage and usage in accordance with international standards that protect individuals from cyber risks.



3. Bridge the Digital Divide: provide support for underprivileged segments to access technology, whether through comprehensive digital infrastructure or by offering training and technical skills to keep pace with digital transformation. Legislators can allocate budgets and policies to improve digital access for all community sectors.

4. Activate a Unified Digital Identity: Adopt a reliable digital identity system that allows citizens secure access to digital services and enhances the credibility of electronic transactions. Legislation should support this system while ensuring security and privacy.

5. Enhance Transparency and Accountability: Establish legal mechanisms to ensure transparency in managing public data and accountability for decisions made using smart systems. These mechanisms can be included in a regulatory framework that defines the responsibilities of each governmental entity.

6. Encourage Partnerships Between the Public and Private Sectors.

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