

Digital Transformation in Entrepreneurship and Startups as a Result of Good Governance

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Abstract---This study explores the concept of digital transformation in entrepreneurship, analysing its impact on start-ups and highlighting the opportunities and challenges faced by entrepreneurs in this context alongside the features of artificial intelligence. The study examines the necessity of digital transformation in the modern business environment, as well as its potential to promote startup growth. The research addresses the concept of digital transformation and its significance, as well as the supporting technologies, such as artificial intelligence. The research discusses how digital transformation can improve operational efficiency, reduce costs and expand market reach. It also reviews the challenges that start-ups encounter when adopting digital transformation, such as high costs, a lack of digital skills, and cybersecurity risks. Finally, the study presents strategies that can enable startups to achieve effective digital transformation.

Keywords---digital transformation, startups, modern technology, operational efficiency, artificial intelligence, cybersecurity.

Introduction

Digital transformation is a developmental tool for countries that are prominent in the global economy. The term emerged in developing countries at the beginning of the millennium, alongside the advent of the internet and modern technologies. Some countries decided to keep pace with technological advancements in digitisation in order to address the rapid evolution of technology in management and economics.

After adopting digital policies, these countries witnessed changes in the world of work and start-ups. Digital transformation undoubtedly has numerous advantages and disadvantages. On the positive side, it enables quick access to information and communication, facilitates money transfers and the rapid

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initiation of projects, and has an impact on foreign trade and the exchange of goods, as well as scientific and professional experiences.

However, disadvantages include the overwhelming amount of information and its sources, the potential for organisations to be breached by unidentified electronic entities, and the leakage of confidential company and organisational information. Significant obstacles include the high cost of technological equipment and the lack of the financial and human resources necessary for the practical implementation of digital transformation.

Thus, we pose the following question: To what extent can start-ups in entrepreneurship be modernised through digital transformation and good governance?

Research Plan:

First section: Concept of digital transformation

First requirement: definition of digital transformation and its impact on entrepreneurship.

Second requirement: the role of digital transformation in developing start-ups and enhancing competitiveness.

Second Section: Challenges facing startups in digital transformation

First requirement: strategies for adopting digital transformation in start-ups.

- Second requirement: requirements for successful digital transformation in start-ups.

Third Section: Prospects for Developing Digital Transformation in Startups

First requirement: the role of innovation and modern technology in establishing digital transformation.

- Second requirement: government policies and initiatives supporting digital transformation

Conclusion

First section: The concept of digital transformation and entrepreneurship, and its reflection on startups

In light of rapid technological advancement, digital transformation has become imperative for startups and entrepreneurs, rather than just an option. This involves adopting digital technologies such as artificial intelligence, cloud computing, the Internet of Things and big data, with the aim of improving processes and enhancing competitiveness. Digital transformation provides entrepreneurs with the opportunity to develop innovative business models, enhance customer experience and boost operational efficiency, enabling them to expand into local and international markets. However, this transformation presents challenges relating to technical infrastructure, cybersecurity, and the need to adapt to ongoing technological changes.

First requirement: Definition of digital transformation and its impact on entrepreneurship

Digital transformation is the process of integrating digital technology into all areas of business, leading to improved performance, increased efficiency, and the innovation of new business models based on data and modern technologies¹.

Digital transformation is the process by which organisations integrate digital technology into all areas of their business. A digital transformation programme reshapes operational processes within an organisation, enhancing efficiency and paving the way for the faster adoption of new technologies in future. Integrating advanced digital technologies, such as machine learning, into transformation projects helps organisations to meet customer expectations and to compete effectively in the market².

As digital transformation will look different for each company, it is difficult to define a one-size-fits-all approach. However, we generally define it as the integration of digital technology into all areas of business, resulting in fundamental changes to how companies operate and deliver value to customers. Furthermore, it is a cultural shift that requires organisations to continuously challenge the status quo,

¹- Maha Khalil Shihada: 'Digital Transformation and Digital Entrepreneurship'. Rmah Journal for Research and Studies, Issue 62, 2024.

²- <https://aws.amazon.com/ar/what-is/digital-transformation/>

experiment frequently and adapt to failure. This sometimes means moving away from long-standing business processes on which entrepreneurship has been built³.

Entrepreneurship is defined as the process of creating and managing new projects based on innovation, while bearing financial and administrative responsibilities, with the aim of offering products or services that meet market needs and achieve economic growth⁴.

1. The impact of digital transformation on entrepreneurship

Digital transformation is fundamental to the growth and sustainability of start-ups. It improves operational efficiency by streamlining processes, reducing costs and enhancing productivity. It creates opportunities for market expansion and increased competitiveness via digital platforms, while improving customer experience through artificial intelligence and data analysis. Furthermore, it allows organisations to make informed decisions based on big data, giving them greater flexibility to adapt to changes. Conversely, entrepreneurship plays a vital role in fostering innovation.

2. Contributions of Digital Transformation to Entrepreneurship

Digital transformation provides new solutions that meet market needs, creating job opportunities and supporting local and global economies. Furthermore, entrepreneurship contributes to sustainability and growth by developing scalable business models that rely on modern technology and building strong partnerships with investors and tech companies.

Therefore, combining digital transformation with entrepreneurial thinking empowers start-ups to achieve rapid and sustainable growth in a competitive and dynamic business environment.

For instance, the Volkswagen Group used Amazon Q Business to link 4,000 job descriptions to 3,200 roles in its global template system. The project was completed efficiently and on time, and an application was created using Amazon Q to formulate a solution in just one day⁵.

Second requirement: The Role of Digital Transformation in Entrepreneurship and Start-ups

Digital transformation is pivotal in enhancing entrepreneurship and supporting start-ups, as it enables companies to leverage modern technology to improve performance and expand their business scope. It reduces operational costs, increasing the efficiency of start-ups and their ability to compete in local and global markets. Additionally, digital transformation provides new opportunities for innovation through the use of:

1. Artificial intelligence and big data analysis.

These technologies facilitate more accurate decision-making, enhance customer experiences and streamline creative industrial and commercial processes⁶.

Many companies are pursuing digital transformation for various reasons, but the most compelling reason is often necessity — it is a matter of survival. In the wake of the pandemic, an organisation's ability to adapt quickly to supply chain disruptions and the time pressures of bringing products to market has become crucial⁷.

Today's customers expect to be able to manage their businesses, perform their tasks and live their lives using the latest technological advancements. They expect this capability to be accessible wherever they are and at any time, on their chosen device, with all the relevant information and personalised content at their fingertips.

The ultimate goal of digital transformation is to meet these expectations⁸.

³- <https://enterprisersproject.com/what-is-digital-transformation>

⁴- Al-Baz, Mohammed. 'Entrepreneurship: The Concept and Importance'. Journal of Economics and Business, Vol. 15, No. 3, 2023.

⁵- <https://aws.amazon.com/ar/what-is/digital-transformation/>

⁶- Khalid Al-Ruwaili. 2021. 'Digital Transformation and Entrepreneurship: Development Strategies and Challenges'. Dar Al-Fikr Al-Arabi, Cairo.

⁷- <https://enterprisersproject.com/what-is-digital-transformation>

⁸- <https://www.ibm.com/think/topics/digital-transformation>

2. The necessity of digital transformation

Digital transformation also empowers entrepreneurs by providing them with access to technological resources and tools that can enhance project development. These include digital platforms, e-commerce and digital marketing. It also fosters flexibility and sustainability within start-ups, enabling them to adapt to market changes and respond quickly to fluctuating demand. Therefore, in an increasingly technology-driven world, digital transformation is no longer just an option; it has become a necessity to ensure the growth and continuity of entrepreneurship.

Second Section: Challenges and Strategies for Successful Digital Transformation in Entrepreneurship and Startups

Start-ups face significant challenges in their daily operations, making it essential to develop strategic plans to tackle these challenges in the competitive landscape of free market businesses. In this environment, constant presence and daily updates on rapidly evolving technological information are demanded.

First requirement: Challenges facing startups

Startups are among the most vital economic drivers in the modern era as they provide opportunities for innovation and create new job positions. They generate considerable financial revenues in a short time and help to reduce unemployment, particularly since the industries in which they operate do not require significant resources and can generate decent returns. However, they face a series of challenges that hinder their development and sustainability.

The most prominent challenges include:

1. Weak financing and difficulty in accessing capital:

Entrepreneurs encounter significant difficulties in convincing investors of the viability of their projects, particularly during the initial stages of establishment when the level of risk is high and bank guarantees are limited⁹.

2. Regulatory and legal environment:

The complexity of administrative procedures, prolonged licensing periods and weak tax incentives make the business climate less attractive for investment¹⁰ and are one of the main obstacles to the growth of startups¹⁰.

3. Lack of qualified human resources

There is a shortage of qualified personnel in the fields of modern management, digital marketing and technology, which restricts the ability of start-ups to compete in open markets¹¹. Additionally, the weak culture of innovation within small enterprises restricts their opportunities for expansion and achieving economic sustainability¹².

4. The Challenge of Digital Transformation

Digital transformation has become an urgent necessity for start-ups as they struggle to adopt modern technological solutions due to weak digital infrastructure and high operational costs¹³.

Consequently, the international community is striving to provide internet access to developing and impoverished countries, enabling them to keep pace with technological and digital advancements, especially as we approach 2026. According to 2023 statistics from the World Bank, there is an urgent need to support these countries:

'About one-third of the world's population, or 2.6 billion people, were still unconnected to the internet in 2023'. While over 90% of individuals in high-income countries used the internet in 2022, only one in four in low-income countries had internet access. Furthermore, 850 million people lack any form of

⁹- Mohammed Al-Arabi. 'Challenges of Entrepreneurship in Sustainable Tourism.' Dar Al-Fikr Al-Arabi, Cairo, 2020, p. 52.

¹⁰- Al-Shamma, Ahmad. 'Entrepreneurship and Sustainable Development: Modern Insights and Applications'. University Publishing House, Cairo, 2021, p. 47.

¹¹- Abu Zeid, Nasser. Managing Small and Medium Enterprises in the Arab World. Dar Al-Safa Publishing, Amman, 2019, p. 88.

¹²- Khalil, Sami. Entrepreneurship and Innovation in the Contemporary Economy. Anglo-Egyptian Library, Cairo, 2022, p. 113.

¹³- Adel, Rami. 'Environmental Tourism and Sustainable Development: An Introduction to the Green Economy'. New University Publishing, Alexandria, 2020, p. 37.

identification. The global community must exert more effort to help developing countries access the internet and utilise technology and digitalisation¹⁴”.

Therefore, addressing these challenges requires the adoption of national policies that support entrepreneurship and facilitate financing, as well as the development of legislation that aligns with the nature of start-ups. Additionally, investing in the development of digital and innovative skills among young people is essential¹⁵.

Second requirement: Strategies for success in digital transformation

Digital transformation is one of the most important drivers of administrative and economic development in the modern era. It is a cornerstone of improving institutional performance and enhancing the competitiveness of countries and organisations. To succeed in this transformation, it is crucial to implement integrated strategies that ensure the sustainability and effectiveness of the digital process at various administrative and organisational levels.

1. Leadership and a clear digital vision

Strong leadership with a comprehensive digital strategic vision is fundamental to the success of digital transformation. Effective leadership can direct efforts towards achieving digital goals that align with the organisation's capabilities and available resources. A recent Algerian study indicates that a lack of unified vision among different administrative bodies is one of the main challenges facing public institutions, leading to a slowdown in the digital transformation process¹⁶.

2. Investment in Human Capital and Development of Digital Skills

Human resources are one of the most important pillars of digital transformation. Adopting modern technology without providing adequate training for individuals can create a disparity between technical capabilities and human skills. Therefore, efforts should focus on developing digital competencies through continuous training programmes and promoting a culture of self-learning. A national study has confirmed that weak digital skills are one of the main obstacles facing Algerian institutions on their journey towards digital transformation¹⁷.

3. Change Management and Building a Supportive Organisational Culture

Change management lies at the heart of any successful transformation, since the digital process necessitates a shift in institutional mindset and behaviour. Involving employees in the transformation process and encouraging them to innovate and take the initiative can help to reduce resistance to change. One study indicated that traditional management culture and bureaucracy remain significant obstacles to the effective implementation of digital transformation in Algeria¹⁸.

4. Developing digital infrastructure and enhancing cybersecurity

A strong and secure digital infrastructure is essential for the success of digital transformation. This includes high-efficiency communication networks, modern information systems and effective data protection mechanisms. An evaluative study shows that the digital infrastructure gap in Algeria still limits the speed of transition to a comprehensive digital economy¹⁹.

5. Innovation and data-driven analysis

Digital innovation and intelligent data analysis are key to ensuring the sustainability and efficiency of digital transformation. Institutions that use digital analysis to inform their decision-making processes are better able to respond to changes. An Egyptian study indicated that integrating digital analysis into

¹⁴ <https://www.worldbank.org/en/topic/digital/overview>

¹⁵ Hala Mansour. 'Digital Transformation and Entrepreneurship in Emerging Economies.' Dar Al-Nahda Al-Arabiya, Beirut, 2023, p. 95.

¹⁶ Khira Shaoushi and Zahra Khoulouf. 'Digital Transformation in Algeria: Presentation and Experience.' Journal of Accounting and Auditing, Algeria, 2023.

¹⁷ ASJP Journal. 'Digital Transformation in Algeria: Reality and Challenges'. Algeria, 2023 <https://asjp.cerist.dz/en/article/2640603>.

¹⁸ Khira Shaoushi and Zahra Khoulouf. 'Digital Transformation in Algeria. Previous reference.

¹⁹ Ben Yza, Youssef. 'Evaluating the Path of Digital Transformation in Algeria (2020–2023).' Arab Journal of Research and Studies in Human and Social Sciences, 2023.

institutional strategies contributes to achieving institutional excellence and improving overall performance²⁰.

The Role of Artificial Intelligence as a Tool for Digital Transformation:

Artificial intelligence (AI) has become an important tool for start-ups and scientific and technological research thanks to its features and advantages, which accelerate production processes, marketing products and facilitating quick communication with competing firms in global markets. AI also enhances knowledge and solves technical problems encountered in the fields of digitalisation and technology.

As industries evolve and customer expectations rise, companies are under increasing pressure to use emerging technologies like AI to innovate and avoid being left behind. Digital transformation is no longer optional; it has become a necessity. According to a report by the International Data Corporation (IDC), 53% of organisations have enterprise-wide digital transformation strategies.

To succeed in today's rapidly changing market, it is essential to evaluate your organisation's approach to operations, decision-making and customer interaction, and adapt to and capitalise on digital transformation opportunities²¹.

AI transformation processes utilise machine learning and deep learning models, such as computer vision, natural language processing (NLP) and generative AI, along with other technologies, to create systems that can:

- automating manual tasks and repetitive administrative work;
- updating applications and IT systems through code generation;
- providing data-driven insights and supporting decision-making using analytics²².

In an interview with a U.S. audio channel, UN expert Danny Wazn highlighted the importance of AI, stating that using AI in organisations does not mean replacing workers with machines, but rather assisting them in overcoming professional obstacles.

He explained to UN News that the focus should be on adaptation, noting that 'some jobs will change and some will emerge anew using these technologies, which will also be more effective'. Figures show that nearly 27% of jobs will be 'assisted' by AI in the coming years, meaning that humans will have technologies to enhance their efficiency rather than being completely replaced²³.

6. Partnerships and institutional integration

Digital transformation requires effective partnerships between various stakeholders, including government organisations, the private sector and universities. Integrating these entities accelerates the transformation process and reduces technological gaps. Studies in Algeria indicate that poor coordination between institutions is one of the main challenges to the success of digital initiatives²⁴.

To succeed in digital transformation, organisations must implement specific strategies. These strategies begin with establishing a clear vision and comprehensive plan involving all stakeholders. It is also necessary to build a strong digital culture that encourages innovation and provides employees with the necessary training.

A focus on customer experience is also essential, with digital technologies being used to meet customer needs and provide personalised services. This involves collecting and analysing customer data, and providing effective digital communication channels.

Selecting the right technologies and investing in modern solutions such as artificial intelligence and cloud computing is also crucial. Data must also be managed effectively to ensure its security and facilitate informed decision-making.

²⁰- Ismail, Salahuddin. 'The Role of Digital Transformation Strategy in Achieving Institutional Excellence'. Scientific Journal of Business Research and Studies, Egypt, 2023.

²¹- <https://online.hbs.edu/blog/post/ai-digital-transformation>

²²- <https://www.ibm.com/sa-ar/think/topics/ai-transformation>

²³- <https://news.un.org/ar/audio/2025/09/1143469>

²⁴- ASJP Journal. 'Digital Transformation in Algeria. Previous reference.

Measuring performance and making continuous improvements through key performance indicators helps to identify strengths and weaknesses, and make necessary adjustments. Strategic partnerships can also be established to leverage external expertise and resources.

Finally, effective leadership is vital for directing efforts, encouraging open communication and celebrating successes²⁵.

Third section: Prospects for Developing Digital Transformation in Startups

Startup owners have a promising future in entrepreneurship, digital transformation and artificial intelligence. This vast field offers opportunities for innovation, creativity and hard work in all areas. Therefore, it is essential to embrace digital transformation in entrepreneurship and abandon the traditional system completely.

First requirement: The Role of Innovation and Modern Technology in Establishing Digital Transformation

Innovation and modern technology are two of the most important pillars on which digital transformation in start-ups relies. Together, they are the main driver for improving institutional performance and achieving productivity and entrepreneurial efficiency. Innovation reflects the ability to find new solutions that meet the demands of the digital age, while modern technology provides the practical means for organisations to implement these solutions and achieve tangible results in economic and social contexts.

In the Algerian market, for instance, there have been clear efforts in recent years to encourage start-ups to adopt modern digital technologies as a fundamental pillar for building a knowledge-based economy. Recent studies indicate that technological innovation has become a critical factor in enabling these institutions to overcome traditional obstacles related to financing, skill shortages and limited markets. Furthermore, digital solutions enhance performance flexibility and improve service quality, enabling organisations to establish an effective presence in both local and international markets²⁶.

In recent years, Algeria has witnessed a series of legal and regulatory reforms aimed at enhancing the investment climate and supporting start-ups. The authorities issued Law No. 22-18 on 24 July 2022 concerning investment, which provides various financial, tax and customs incentives to encourage local and foreign investors to invest in production sectors and entrepreneurship²⁷. Additionally, Law No. 23-17, dated 6 August 2023, regarding economic real estate intended for investment, complements this by organising the process of allocating and transferring economic real estate to investors, thereby ensuring transparency and ease of access to properties intended for investment²⁸.

Against this backdrop, the National Observatory for Startups was established to monitor innovation and evaluate entrepreneurial project performance. Furthermore, public authorities have emphasised the necessity of providing logistical and financial support to project owners through a series of executive decrees designed to overcome administrative and financial obstacles²⁹.

The Ministry of Higher Education and Scientific Research has initiated the establishment of university business incubators to enable graduating students to commercialise their research projects, granting them patents in coordination with the Ministry of Startups and the Knowledge Economy. The latter supports them financially and technically in the early stages of launching their projects³⁰.

In addition, the National Agency for Youth Employment has been transformed into the National Agency for Support and Development of Entrepreneurship (NASSDA). This new institution is

²⁵ Bakkah Learning, 'Requirements and steps for digital transformation and its stages.'

²⁶ Qassem, M. and Boudawood, S. 'The reality of start-ups in Algeria (challenges and barriers).' University of Ouargla, 2023.

²⁷ Official Gazette of the People's Democratic Republic of Algeria. Law No. 22-18, dated 24 July 2022, regarding investment. Issue 50, 2022.

²⁸ Official Gazette of Algeria, Law No. 23-17 dated 6 August 2023 regarding economic property directed for investment, Issue 51, 2023.

²⁹ Official Gazette of Algeria, Executive Decree No. 21-454, 14 December 2021, concerning the establishment of the National Observatory for Startups, Issue 92, 2021.

³⁰ Ministry of Higher Education and Scientific Research, 'Official Statement on the Establishment of University Incubators and Supporting Graduates' Patents', published on the official website mesrs.dz.

responsible for supporting and financing start-ups and small to medium-sized enterprises as part of a comprehensive national policy aimed at enhancing the digital economy and entrepreneurial innovation³¹.

Some studies suggest that digital transformation cannot be achieved solely by adopting technology; rather, it requires fostering a culture of innovation within the organisation and activating the potential of young people with creativity and initiative. Empowering these talents enables the development of local applications that align with the specifics of the Algerian market, and helps to build a national economic model based on knowledge and creativity³².

Field research highlights that organisations which have adopted technological innovation and benefited from institutional support through incubators and digital accelerators have become more competitive and capable of expansion. Governmental support structures, such as the National Agency for the Promotion of Technological Parks, have fostered an environment conducive to digital transformation by encouraging collaborations between universities and entrepreneurs, as well as providing funding and support programmes for emerging digital projects³³.

Thus, it becomes clear that innovation and modern technology are an integrated strategic vision aimed at transforming start-ups from entities with limited capabilities into effective economic actors in a rapidly changing and increasingly competitive market, not merely technical tools. This approach establishes the foundations of digital transformation as a sustainable development option, enabling Algerian startups to keep pace with global developments and integrate into the modern digital economy.

Second requirement: Government policies and supporting initiatives for digital transformation

The Algerian government is placing an increasing focus on integrating digital transformation into start-ups, recognising the importance of this trend in diversifying the national economy and strengthening the competitiveness of local enterprises. This interest has materialised through the launch of a series of policies and initiatives aimed at supporting entrepreneurs and providing a stimulating digital environment that combines innovation, modern management and smart financing.

These policies have been outlined since the establishment of the Ministry of the Knowledge Economy and Startups, which has made digital transformation a central focus of its programmes. The ministry's objectives include facilitating the establishment of start-ups, providing a support system comprising incubators and digital accelerators, and developing a digital infrastructure capable of keeping pace with global technological advancements. The ministry also works to enhance partnerships between the public and private sectors in the field of digitisation to encourage the transfer of knowledge and technology to start-ups³⁴.

A study by Fartas Fatiha (2023) reveals that the Algerian government has adopted a policy based on the principle of 'institutional nurturing of innovation', providing national programmes to support innovative projects and offering tax and customs incentives to enterprises operating in the field of modern technology. The establishment of the National Agency for the Promotion of Technological Parks is an important step in developing a national digital system that enables start-ups to access electronic markets and enhance digital competencies³⁵.

Conversely, Belkhir Maysoun and Al-Aid Gharbi (2023) contend that the government's current policies are intended to foster a comprehensive ecosystem for startups, linking research centres and universities with investors and economic stakeholders. This connection enables start-ups to benefit from the results

³¹- Official Gazette of Algeria, Executive Decree No. 22-254, 28 June 2022, regarding the transformation of the National Youth Employment Support Agency into the National Agency for the Support and Development of Entrepreneurship (NASSDA), Issue 47, 2022.

³²- Fartas, Fatiha. 'Startups facing challenges in the environmental support system in Algeria.' *Journal of Scientific Research Papers*, Vol. 10, No. 2, 2023. Available on the ASJP platform.

³³- Belkhir, Maysoun and Al-Aid: 'Supporting structures and mechanisms for start-ups in Algeria.' University of El Oued, 2023.

³⁴- Ministry of Knowledge Economy and Startups. National Strategy for Digital Transformation in Algeria. Algeria, 2023.

³⁵- Fartas, Fatiha. Startups Facing the Challenges of the Algerian Ecosystem. *Journal of Scientific Research Notebooks*, Volume 10, Issue 2, 2023, ASJP Platform.

of applied research, contributing to the development of national digital solutions for both the productive and service sectors³⁶.

National initiatives also include creating digital platforms for registering start-ups and monitoring their activities. These platforms facilitate administrative support processes and provide an up-to-date database on start-up operations. Additionally, programmes have been launched to train human resources in digital fields, with the aim of bridging the technological gap and enhancing the capabilities of local talent capable of leading digital transformation projects. These initiatives represent a practical step towards achieving a knowledge-based, innovative economy that aligns with Algeria's sustainable development goals.

It can therefore be said that government policies and national initiatives form the institutional framework that creates a conducive environment for digital transformation in start-ups. However, ongoing updates to economic legislation, improvements to financing mechanisms and expansion of international partnerships for technology transfer are required for these efforts to succeed, thereby enhancing the competitiveness of Algerian institutions at regional and global levels.

Conclusion

In summary, it is clear that digital transformation is no longer an optional extra for start-ups; it has become a strategic necessity driven by competition in an era of unprecedented technological acceleration. This study has demonstrated that the adoption of modern digital technologies, particularly artificial intelligence, enhances operational efficiency, improves service quality and expands market reach. This enables startups to achieve a sustainable competitive advantage, strengthening growth and sustainability opportunities.

However, digital transformation involves more than merely introducing technology into daily operations. It represents a profound cultural and managerial shift that requires organisations to adopt a strategic vision based on flexibility, innovation and continuous learning. This involves investing in the development of digital competencies and creating an organisational environment that encourages experimentation and initiative.

To maximise the impact of digital transformation and ensure the success of start-ups on this path, the following set of practical recommendations can be proposed:

Enhance the legislative and regulatory framework for digital transformation by enacting clearer laws regarding the digital economy, data protection and electronic transactions.

Develop national digital training programmes aimed at entrepreneurs and young professionals in collaboration with universities and the Ministry of Startups.

Support applied scientific research in areas such as artificial intelligence, big data and fintech, thereby linking universities to their economic environment.

- Improve digital infrastructure and expand high-speed internet coverage to rural areas to enable all start-ups to benefit from digital opportunities.
- Encourage partnerships between the public and private sectors to accelerate digital transformation in the productive and service sectors while facilitating access to innovative financing for digital projects.

Activate the role of university business incubators and connect them with support platforms for start-ups, such as the National Agency for Support and Development of Entrepreneurship (NASSDA), to ensure ongoing monitoring and support.

Start-ups that succeed in integrating digital transformation into their developmental strategies will be better positioned to achieve leadership and contribute to building a diverse and sustainable national digital economy. Therefore, it is recommended that innovation and technology policies continue to be

³⁶ Belkhir, Maysoun, and Gharbi, Al-Eid. Supporting Structures and Mechanisms for Startups in Algeria. University of El Oued, 2023.

supported in order to build a future economy based on knowledge and comprehensive digital transformation in Algeria.

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