

**Algeria's Potential to Attract Foreign Direct Investment and Localize Technology through Smart Industrial Cities
Shenzhen as a Model for the Transformation from a Developing City into an Advanced Industrial Hub**

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Abstract:

This research addresses the importance of integrating the industrial and digital environment within a sustainable system that attracts capital and contributes to knowledge transfer and technology localization. Shenzhen is considered the superior model of a smart industrial city that is linked to trade and advanced industries connected to databases and 5G networks, in addition to multimodal logistical connectivity within the largest global supply chains. The research aims to highlight Algeria's natural potential, logistical advantages, and geo-economic location that enable it to accommodate the smart industrial zones model. In our research, we relied on an analysis of foreign direct investment flows and international trade in Shenzhen, and we concluded that smart industrial zones increase the attraction of foreign direct investment, international trade, and achieve accelerated economic growth.

Keywords: Smart industrial cities – Logistics and maritime capabilities – Foreign direct investment – Technology localization – Integration of smart industrial zones in Algeria.

Jel Classification Codes : O1, O23, O33

1. INTRODUCTION :

Innovative industrial smart zones aim to convert a developing city into an advanced metropolis by implementing an integrated system that enhance trade and attract foreign investment, connecting sophisticated digital infrastructure with multimodal logistics systems to streamline the movement of goods and elevate service quality. These zones exhibit significant flexibility, allowing for rapid adaptation to advances and contemporary technologies that enhance their technological capabilities. The experience of Shenzhen in China exemplifies the significance of aligning a sophisticated environment with investment.

Algeria is ideally positioned to host smart industrial cities owing to its unique geographical and economic attributes. Its strategic position establishes a direct connection between Europe and Africa, rendering it an essential center for transcontinental commerce. The extensive and varied natural resources, encompassing energy, minerals, and agriculture, provide a robust basis for any comprehensive industrial development initiative. In recent decades, Algeria has endeavored to enhance its infrastructure in transport and logistics, encompassing seaports, international airports, road networks, and railways, thereby positioning itself favorably to implement the innovative industrial zone model that connects local production to global supply chains. This method enhances the efficiency of international trade and facilitates technology localization and knowledge transfer via sophisticated industrial partnerships with global partners, especially prominent institutions in innovation and contemporary technologies. Global experiences, such as those from Shenzhen, demonstrate that the efficacy of any smart industrial zone is contingent upon its capacity to establish an integrated system that amalgamates research and development, local talent cultivation, and the attraction of high-quality international investment. In this context, facts and statistics on international commerce and foreign direct investment in Shenzhen are utilized to evaluate performance and analyze global market trends, aiding in the formulation of more sustainable and prosperous economic policies. The profound interdependence between capital and knowledge constitutes a fundamental element of this model's efficacy, as foreign direct investment can evolve from a simple financial influx into a strategic instrument for enhancing national capacity and fortifying the industrial sector via the establishment of research and development centers, support for start-ups, and funding of renewable energy initiatives. By following this trajectory, Algeria can diversify its economic framework, channel investments into manufacturing and technology sectors, and thereby expedite economic reform initiatives. This approach will convert structural constraints into sustainable development prospects and broaden the industrial export base. This will enable Algeria to strengthen its position in the industrial landscape as a regional hub for advanced production and technology, aligning with its goal of establishing a diversified national economy.

Consequently, we may articulate the primary research question as follows :

How significantly can the concept of a bright smart industrial city enhance the appeal of foreign direct investment and expedite technology localization in developing economies, particularly in Algeria ?

Sub-queries:

What are the structural and functional attributes of smart industrial cities that render them efficient conduits for attracting foreign direct investment and facilitating technology localization?

What strategies can Algeria implement to establish smart industrial cities that attract foreign investment and facilitate technology localization?

To what degree has Shenzhen's experience been effective in attracting foreign investment and enhancing its status as a hub for international trade?

Hypotheses for research:

This issue statement includes a series of hypotheses, specifically:

Enhanced logistical connectivity amplifies foreign direct investment inflows and industrial exports.

Algeria's implementation of a holistic strategy to establish smart industrial cities founded on modern digital infrastructure will facilitate international investment and encourage technology localization, thus fostering sustainable economic growth.

Shenzhen's unique attributes, such as its strategic geographic location and sophisticated infrastructure, have significantly facilitated the attraction of foreign direct investment and solidified its status as a worldwide hub for international trade.

Objectives of the research:

To delineate the principal attributes of smart industrial cities and their preparedness to attract foreign direct investment, emphasizing the significance of these attributes in augmenting their competitiveness.

To assess Algeria's resources and competencies for establishing intelligent industrial cities that can attract foreign direct investment and facilitate technology localization.

To assess the applicability of Shenzhen's experience in Algeria, enabling the transference of its effective methodologies for creating smart industrial cities and augmenting their investment appeal.

Significance of the research:

The significance of the study lies in providing a comprehensive perspective on the development of smart industrial cities that can attract foreign direct investment and facilitate technology localization, using Shenzhen as a practical model that exemplifies the attraction and localization mechanisms characterized by sophisticated logistical connectivity, advanced digital infrastructure, and systems of innovation and scientific research. The study aims to extract applicable lessons for the Algerian context by identifying key determinants for the success of smart industrial cities and offering practical strategies to boost their competitiveness and transform them into drivers of sustainable economic growth.

Research Methodology and Tools :

The research employs a deductive methodology, transitioning from overarching notions of smart industrial cities and their attraction and localization mechanisms to their implementation in Algeria, bolstered by a case study of Shenzhen, accompanied by descriptive and comparative analyses utilizing tables and graphs.

2. Intelligent industrial cities their concept, emergence, and attributes that attract foreign direct investment

2.1. Concepts about intelligent industrial cities

Smart industrial cities signify a transformative evolution in global economic development, transcending traditional industrial clusters to become expansive, integrated urban areas that encompass diverse industries, sophisticated logistics infrastructure, and residential and tourism services that augment their appeal. These cities utilize contemporary technologies, such as the Internet of Things, artificial intelligence, and big data analytics, to facilitate intelligent management of infrastructure, energy, transportation, and logistics. (Mingqiang Xu, 2024)

Recent studies indicate that smart industrial cities serve as strategic platforms that integrate industrial production and technological innovation with quality of life, thereby playing a crucial role in economic development and attracting foreign direct investment (Mohsen, 2024), which can be utilized to localize and advance technology.

An integrated smart industrial city is characterized as a multifunctional cultural and industrial center that incorporates digital transformation technologies, including artificial intelligence and the Internet of Things, with production management and logistics services. This model is defined by the integration of industrial sectors with an innovative logistics system and social services,

underpinned by an advanced information infrastructure that improves operational efficiency, investment appeal, and sustainability of living, thereby reinforcing its capacity to contribute significantly to economic development and technological transformation (V. Omelyanenko*, 2025).

2.2. The inception and historical development of intelligent industrial cities

The concept of a "smart industrial city" gained prominence with the proliferation of information and communication technology toward the end of the 20th century, building on older paradigms of planned industrial cities from the 19th and 20th centuries. The city of New Lanark in Scotland, established by David Dale in 1785, aimed to create an integrated community rather than just a factory by uniting workers and factories in a conducive working environment that addressed their living challenges amid the prevailing deteriorating working conditions. In this location, the foundational concept of an integrated industrial city, amalgamating labor, residential areas, and services, was established despite the lack of digital technology at the time. Siméon, 2012

Since the 1990s, the digital revolution has transformed traditional models into a new technological and informational framework, wherein the utilization of the internet and big data has become indispensable for information exchange and the management of industry and services. Consequently, smart industrial towns have historical foundations, evolving from the concept of an integrated industrial city encompassing economic and social aspects to a digitally innovative city, enhancing its sustainability and appeal for foreign direct investment.

The trend in integrated industrial cities has progressively transformed into the smart industrial city, which amalgamates industrial production, logistics, and digital services within a cohesive, sustainable framework. Nijkamp, 2011

The evolution of the smart city has progressed through three phases: (Wu, 2018)

Phase 1: Preparation for the pilot and conceptual development (1990s to 2009)

Phase 2: Propagation of the concept and execution of preliminary experiments

Phase 3: Shift to a cohesive, intelligent urban framework

Table 01: Distinctions between conventional industrial cities and smart industrial cities

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Conventional industrial cities	smart industrial cities
Diverse manufacturing, food, and textile sectors	Advanced sectors include renewable energy and electronics, as well as electrical and mechanical industries.
Minimal, labor-intensive, and economical.	Grounded in innovation, research and development (R&D), and technology transfer.
Mechanical apparatus and conventional manufacturing methods	Internet of Things, artificial intelligence, robotics, and big data
Restricted (basic accommodation, community markets)	Comprehensive ecosystem (contemporary residential areas, education, healthcare, tourism, sophisticated logistics).
Target markets are confined to specific local or regional areas.	Incorporation into global value chains and exportation of advanced technological products.
Restricted to regional shows or commercial representatives	Intelligent international marketing using internet channels and global exhibitions.
Inadequate logistics connectivity	Consolidated supply chains

Compiled by researchers

The table outlines the key differences between conventional industrial cities and smart industrial cities across multiple critical dimensions. Conventional cities focus on manufacturing, food, and textile sectors, exhibit low productivity, and rely on labor-intensive tasks utilizing rudimentary technologies. Smart cities prioritize advanced sectors like renewable energy and electronics, relying on innovation and research and development, and employing innovative technology such as the Internet of Things and artificial intelligence. Smart cities offer a cohesive environment encompassing contemporary housing, education, and healthcare, and pursue global marketing via digital platforms, whereas traditional cities are confined to local markets.

Logistics interlinks industries, production hubs, and export centers by establishing efficient networks for the transportation of supplies and goods, thereby accelerating the production process and minimizing costs. These networks utilize several transportation modes, including trucks and railways, with intelligent storage systems that guarantee the prompt availability of supplies. Supply chain management systems strengthen cooperation between suppliers and manufacturers, hence enhancing production efficiency and augmenting firms' capacity to satisfy worldwide market demands.

2.3. Intelligent industrial cities as a strategy for attracting foreign direct investment

The emergence of smart industrial cities, distinguished from traditional areas, indicates that their capacity to attract foreign direct investment is contingent upon fundamental mechanisms, primarily advanced digital infrastructure, transparent economic governance, industrial integration via logistical interconnectivity, and an appealing living environment. These factors indicate that smart industrial cities extend beyond their function as production hubs, evolving into important regions that are swiftly assimilating into the global economy and enhancing their capacity to attract foreign investment.

Smart industrial cities offer a compelling investment climate via sophisticated digital infrastructure, including intelligent transportation systems, sustainable energy solutions, and electronic service platforms, which diminish operational expenses and enhance efficiency. The implementation of digital governance in investment and licensing processes improves transparency and diminishes bureaucracy, hence augmenting investor trust. Beyond economic considerations, the quality of life and associated services significantly influence the attraction of talent and money, as these cities combine industry, housing, education, healthcare, and tourism. Recent studies suggest that this integration enhances the ability of smart industrial cities to assimilate into global value chains and facilitates the attraction of foreign investment.

- **Attributes of intelligent industrial cities:**

Smart industrial towns contrast with conventional industrial models through attributes that demonstrate their technological and economic integration, rendering them an optimal setting for technology localization and innovation promotion.

Smart industrial cities are evolving beyond mere production zones into cohesive systems that amalgamate industry, technology, and urban services. They embody multifaceted entities wherein digital infrastructure amalgamates with components of environmental sustainability, and smart supply chains converge with logistics operations, thereby enhancing their appeal to foreign direct investment and fostering innovation and technology localization. They are distinguished by the following characteristics: (Mangan, 2023)

Functional integration: amalgamating industry and logistics while connecting them to residential amenities and other tourism activities under a unified urban framework.

Digital infrastructure: Dependence on the Internet of Things, artificial intelligence, sophisticated information systems, and cloud computing to oversee and manage production, transportation, and energy operations.

Environmental sustainability: Utilize renewable energy, manage waste effectively, and comply with sustainable economic criteria.

Transparency and digital governance: Streamlining administrative processes using electronic platforms, diminishing bureaucracy, and enhancing investor trust.

Integration of industrial logistics: Linking diverse sectors with intelligent supply chains that improve efficiency and minimize expenses.

Quality of life: Creating an appealing living environment through housing, education, and healthcare to attract human talent.

Scalability and innovation: Facilitating research and development (R&D) and collaborations between academic institutions and industry.

3. Algeria's capacity for the development of intelligent industrial cities

Establishing Smart industrial communities in Algeria is a strategic decision to enhance foreign direct investment, expedite technology localization, and develop a national knowledge repository. The Algerian economy, historically dependent on the oil sector for hard currency, requires structural diversification to facilitate its integration into global value chains. In this context, intelligent industrial cities can serve as catalysts for transformation by attracting advanced foreign enterprises, facilitating the development of local products by universities and research institutions, and enhancing the capabilities of young Algerians.

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the Mediterranean Sea, linking the European and African continents, thereby enabling the development of a comprehensive logistics system via its seaports and extensive road and rail networks. Due to these advantages, Algeria may assume a crucial role in investments and capabilities in maritime transport, storage, and digital logistics services, thereby enhancing its status as a developed regional and worldwide industrial hub.

Algeria possesses an abundance of natural resources, particularly in solar and wind energy, enabling it to emerge as a leader in the production of clean hydrogen as a sustainable substitute for fossil fuels. This hydrogen can serve as fuel for several transportation methods and in heating and cooling systems, as well as in ammonia synthesis and refining operations. This method also facilitates the establishment of intelligent industrial towns by fostering the growth of sophisticated and eco-friendly industries.

The national proficiency at the Centre for the Development of Advanced Technologies (CDTA) serves as a robust and dependable basis for the advancement of Smart industrial zones in Algeria. The center includes over forty technological specializations, such as robotics, embedded systems, microelectronics, nanotechnology, and industrial engineering, along with technical platforms for initial design, additive manufacturing, and 3D digital scanning. (Ntic-Dz, 2023)

The Algerian government, via the Ministry of Post and Telecommunications and in collaboration with the Regulatory Authority for Post and Electronic Communications (ARPCE), has initiated concrete measures to implement fifth-generation (5G) technology by issuing a formal call for tenders for operating licenses on 29 May 2025, with the intention of granting provisional licenses in July of that year. Eight provinces have been selected as initial pilot regions: Algiers, Oran, Constantine, Setif, Skikda, Ouargla, Tlemcen, and Blida. Commercial operations in these regions are set to commence in the third quarter of 2025, with a subsequent gradual expansion to additional provinces and industrial zones. This method validates, as per the ARPCE regulatory authority report, that investment in 5G constitutes a strategic initiative to facilitate smart city applications necessitating high data rates and minimal latency (Ousmati, 2025).

Foreign direct investment (FDI) serves as a crucial conduit for technology transfer to developing nations. In Algeria, foreign direct investment inflows have remained below 1.5% of GDP in recent years, indicating the necessity for a more appealing investment climate. The establishment of intelligent industrial towns has the potential to convert these investments from simple financial transactions into conduits for technology and information dissemination, especially in fields like electronics and renewable energy. United Nations Conference on Trade and Development, 2023

Algeria's capacity for energy transition serves as a crucial gateway for technological localization. At now, renewable energy sources constitute merely 5% of overall energy production. The establishment of intelligent industrial cities that can support solar and wind energy initiatives may elevate this proportion to 20–25% by 2030, hence enhancing local technological production capabilities instead of reliance on imports (IEA, 2022).

Embracing the smart industrial city paradigm might result in a significant advancement, with projections indicating that foreign high-tech investment and research and development expenditures may rise through the establishment of innovation centers affiliated with universities.

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The renewable energy industry presents a significant opportunity, as the integration of solar and wind energy installations into smart industrial city systems could elevate their contribution to 25% by 2030.

The output of constrained manufacturing sectors could be enhanced by incorporating innovative value chains driven by technology and industrial intelligence.

Advancement of information and communication technology utilizing artificial intelligence and data centers.

Table 02: Risks Associated with the Establishment of Smart Industrial Cities in Algeria and Strategies for Mitigation

Hazards Identified	Probability of risk occurrence	Risk Mitigation Strategies
Infrastructure	20%	Coordinated infrastructure comprising roadways and logistical centers that link production zones to one another, as well as to ports, airports, and various transportation modalities.
Digital technology	15%	Diversification of industrial sectors and emphasis on advanced industries
Sectoral Domains	20%	Comprehensive system to facilitate research and development while connecting universities and manufacturing facilities
Innovation and entrepreneurship	15%	Dependence on renewable energy to eradicate carbon emissions
Enduring advancement	10%	A cohesive urban environment featuring residential and social

		services designed to entice investment.
City planning	10%	Investment inducements and adaptability in trades and collaborations
Capital Allocations	10%	Compiled by academics utilizing official metrics and data pertinent to the respective sectors

Compiled by researchers

The percentages presented in the table above delineate the risk priority associated with the initiative to develop smart industrial cities in Algeria. Infrastructure ranked highest at 20%, as the inadequate connectivity between production zones and ports and airports is deemed the primary impediment to the movement of goods and the attraction of investment, particularly in light of the average evaluations of the logistics performance index. The industrial sector constitutes around 20% of the Algerian economy, which remains significantly reliant on hydrocarbons. Consequently, the urgent imperative for enhanced industrial diversification is to mitigate dependency on a singular resource. Digital technology, innovation, and entrepreneurship each contribute 15%, since inadequate digital infrastructure and insufficient connections between universities and industries impede the shift to a smart industrial city centered on artificial intelligence and research and development. Sustainable development constitutes 10%. Despite being a crucial pillar, Algeria has made considerable advancements in renewable energy, hence diminishing the level of risk. Ultimately, urban planning constitutes 10% since Algeria possesses a commendable urban experience; yet, sustaining welfare and housing services to attract talent presents an ongoing difficulty necessitating additional efforts. This distribution indicates that the primary problems are infrastructure development and industry diversification, succeeded by digital transformation and innovation support, but sustainability and urban planning issues are comparatively less dangerous, though strategically significant.

Table 03: Logistics Performance Index for Algeria (LPI 2023)

Performance Measurement	Overall Logistics Performance Index	Customs	Infrastructure	International Shipments	Logistics Competence	Timeliness
Score indicates an average level)	2.5	2,3	2,1	3	2.2	2.6

Compiled by researchers based on the cited source : (BANK, 2025)

The table illustrates Algeria's logistics performance index, which is average both regionally and internationally, with significant variances among its components. Algeria attained a score of 2.5 on the overall logistics performance index, positioning it within the median range relative to worldwide benchmarks. The highest score was in the international freight category, reflecting a comparative ability to manage external freight flow and facilitate international communication channels. Conversely, deficiencies are apparent in logistics efficiency (2.2) and infrastructure (2.1), indicating an immediate necessity to enhance transport networks and facilities to facilitate the more efficient movement of commodities. Customs (2.3) and timeliness (2.6) indicate a median standard need enhancement in procedural efficiency and adherence to time constraints. These results indicate that Algeria requires strategic investments in infrastructure and logistics governance to enhance efficiency and reduce the disparity with economies exhibiting superior logistics performance.

3.2 Algeria's Digital Transformation Strategy 2030

Algeria's Digital Transformation Strategy 2030 is an ambitious national framework designed to expedite the digitization of many sectors and foster a knowledge-based economy, thereby modernizing public services and facilitating innovation through various components: (hcn, 2024)

Enhancing government services and improving accessibility through the implementation of a thorough and efficient digital transformation.

Fostering and endorsing start-ups while advancing innovation.

Formulating robust plans for the safeguarding of data and information via national oversight of digital infrastructure.

Modifying rules and regulations to align with the demands of digital transformation.

Establish communication and information networks while enhancing capacity and efficiency for improved services.

Develop and educate personnel to improve digital skills.

Facilitating research and development helps expedite innovation and localize technologies.

Connection of the national strategy to intelligent industrial cities

Algeria's Digital Transformation Strategy 2030 aligns with the prerequisites for developing smart industrial zones by establishing dependable communication networks linking factories to logistics centers and offering digital governmental and administrative services that streamline investment and export processes. It also functions to cultivate a digitally proficient workforce capable of supporting smart manufacturing technologies and the Internet of Things. Moreover, the strategy

fosters an atmosphere of innovation and scientific inquiry, urging enterprises to create intelligent and sustainable solutions. This strategy consequently serves as the foundation for developing cities and industrial zones that can attract investment and facilitate the localization of innovative technology.

4. Shenzhen's paradigm as a prototype for the evolution into a global smart industrial metropolis

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adjacent to Hong Kong, recognized as China's Silicon Valley. This provides a geographical and cluster advantage associated with international commerce networks. It is predicated on technology and innovation, utilizing digital infrastructure to enhance quality of life and living standards. Shenzhen possesses three integrated logistics hubs: a seaport and an airport. A multimodal logistics hub in the south integrates maritime, aerial, and rail transport. In 2022, there were 188 cross-border train transfers to Schengen Europe, transporting around 132,000 tons of cargo and 17,504 containers. (Daily, 2022)

This indicates that the objective extends beyond constructing buildings; it encompasses the creation of an advanced and interconnected technology network that facilitates sophisticated industries and links the city to the capital and global markets with high efficiency.

Economic and digital performance metrics in Shenzhen:

In 2023, GDP reached 3.46 trillion yuan, reflecting a 6% increase.

The city's exports and imports totaled 3.87 trillion yuan.

A 5G network comprising over 70,000 stations and 13 million users, facilitating a "digital operating network" for manufacturing and logistics. (News, 2023)

Air freight: 1.6 million metric tonnes through Bao'an Airport in 2023.

China-Europe Rail Services: Routes to and from Shenzhen (2023)

Port operations are projected to handle around 29.9 million TEUs in 2023, positioning it among the world's most advanced.

A varied industrial foundation encompassing mechanics, electrical engineering, batteries, and solar cells. These components render the industrial zone virtually synonymous with the economic capital due to its direct connectivity to ports, airports, and railways, eliminating dependence on external transportation. (Li, 2024).

In March 2024, Shenzhen revised its strategy for industrial cluster development, targeting an enhancement of strategic emerging industries' value to exceed 1 trillion yuan. The government's strategic plan emphasizes the establishment of significant industrial clusters valued in the trillions and hundreds of billions of yuan, encompassing advanced sectors such as high-definition displays and artificial intelligence. The city's innovation ecosystem harmoniously interacts with its industrial chains, facilitating new strategic industries to attain around 1.45 trillion yuan in 2023, constituting nearly 41.9% of GDP (Fung, 2024).

4.2. Objectives of Shenzhen:

Establish e-government platforms to enhance and expedite data interchange.

Guarantee the accessibility of sophisticated communication networks.

Monitor business operations by developing big data platforms and utilizing artificial intelligence, automation technologies, Internet of Things sensors, and smart device management systems.

Facilitate the establishment of an open government data site.

Implement regulations to guarantee data confidentiality and privacy protection.

A three-tiered smart city framework comprising infrastructure, digital architecture, and technology and innovation architecture.

Promote eco-friendly development by implementing environmental strategies that ensure sustainability and protect biodiversity.

Facilitating the interconnection of port logistics over decades, allowing the city to commercially expand and enhance supply chains (Weixin Wang, 2023) and technology within a cohesive smart industrial city framework.

Technical education in Shenzhen, China, has enhanced scientific standards by expediting the proliferation of electric vehicles and strengthening logistical connections throughout value chains, encompassing battery production, storage, and distribution. This has positively influenced export growth, assembly operations, and after-sales services. Alexandre De Podestá Gomes, 2022.

Table 04: International Trade, Exports, and Imports in Shenzhen

Duration	Export value in trillion yen	Import value in trillion yen	Total ¥ trillion

2015	1.60	1.10	2.70
2022	2.19	1.48	3.67
2023	2.46	1.41	3.87
2025	1.31	0.859	2.169

Compiled by researchers based on the cited source : (ceicdata, 2021)

The table illustrates the evolution of foreign trade in Shenzhen, directly indicating its performance as a prototype smart city that employs innovation and technology to enhance its economic standing. Over the span of a decade, total exports and imports increased from 2.70 trillion yuan in 2015 to a peak of 3.87 trillion yuan in 2023, demonstrating the city's capacity to utilize its superior technology infrastructure and intelligent logistical networks to facilitate commerce. The table indicates that exports have continuously surpassed imports in all years, affirming Shenzhen's high-tech manufacturing sectors' capacity to produce a sustainable trade surplus through 2025. Despite a significant reduction in total commerce to 2.169 trillion yuan, exports (1.31 trillion) surpassed imports (0.859 trillion), demonstrating the economy's resilience and capacity to sustain its competitive advantage amid global market fluctuations.

This enduring trade performance demonstrates the efficacy of Shenzhen's smart city model in fostering a dynamic economic landscape conducive to innovation and adaptability, solidifying its status as a global exemplar for future cities.

Figure 01: The value of foreign trade (exports and imports) in Shenzhen from 2015 to 2025

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Compiled by researchers in accordance with the aforementioned table

Shenzhen exemplifies the effective implementation of the smart city idea to facilitate swift economic expansion and draw substantial international investment. Since its designation as a special economic zone, it has established a business climate predicated on innovation and modern digital technology, encompassing highly efficient logistical infrastructure and an e-government services system that minimizes costs and accelerates operations. These factors have established Shenzhen as a strategic center for global corporations pursuing an advanced technological foundation and a vibrant market in central China, drawing substantial foreign direct investment across diverse sectors, including advanced electronics, telecommunications, green industries, and artificial intelligence. The success in obtaining investment validates the smart city model's capacity to maintain its allure for international investors, as evidenced by the trends in foreign direct investment flows from 2015 to 2023.

Table 05: Foreign Direct Investment in Shenzhen from 2015 to 2023

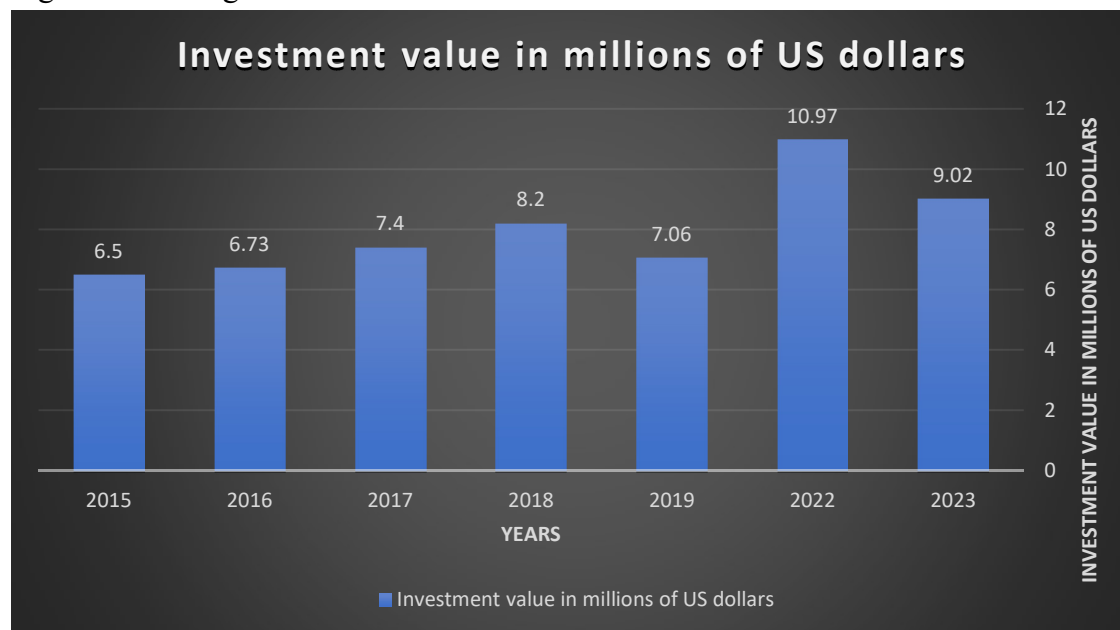
Annual period	Investment valuation in millions of US dollars
2015	6.50
2016	6.73
2017	7.40
2018	8.20
2019	7.06
2022	10.97

2023	9.02
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Compiled by researchers utilizing source: (Data, 2021)

The table above illustrates the evolution of foreign direct investment in Shenzhen from 2015 to 2023, emphasizing the crucial significance of smart cities in attracting international capital. From 2015 to 2018, inflows increased from \$6.50 million to \$8.20 million, indicating consistent growth that demonstrates investor confidence in a contemporary corporate landscape characterized by digital infrastructure and intelligent government services. In 2019, investments experienced a minor decrease to \$7.06 million as a result of the COVID-19 crisis; nevertheless, they subsequently surged, reaching a zenith of \$10.97 million in 2022, illustrating the city's capacity to draw investment in high-tech industries despite a prior downturn. In 2023, investments totaled \$9 billion. This trend underscores the efficacy of the smart city model in fostering an innovative environment and digital governance that promotes sustained investment and bolsters Shenzhen's status as a premier worldwide hub for advanced technology.

Figure 02: Foreign Direct Investment Inflows 2015-2025



Compiled by researchers according to the aforementioned table

5. Conclusion:

Algeria possesses significant potential to implement the smart industrial city model as a key mechanism for technology localization. The present situation in Algeria demonstrates limited foreign direct investment, research and development, and renewable energy; however, the implementation of this model is expected to markedly enhance these metrics and elevate the industrial sector's contribution to the national economy. Shenzhen has demonstrated that integrating knowledge transfer via foreign direct investment with the enhancement of the digital landscape and the encouragement of local innovation offers Algeria a significant opportunity for technical advancement and the transformation to a robust and competitive economy. Considering Algeria's adaptability and capacity to integrate the elements necessary for success, the potential for transitioning to a smart industrial city model seems optimistic and attainable.

Outcomes:

The research indicates that enhancing multimodal logistics connectivity is directly associated with heightened exports, inflows of foreign investment, and the growth and integration of supply chains by linking industrial zones to maritime, terrestrial, and aerial ports, thereby expediting trade flows and augmenting labor mobility throughout different production phases, alongside the localization of factories and technologies, which further intensifies industrialization.

The study demonstrated that digital density has enabled factories to connect with supply chains, fostering an environment conducive to technology localization. The availability of data and high-speed network coverage facilitates knowledge transfer, information exchange, coordination with suppliers, and responsiveness to market fluctuations.

The integration of these competencies with sophisticated industrial environments featuring advanced infrastructure fosters the formation of start-ups that may leverage this technology and employ specialists in artificial intelligence, digital industries, and manufacturing.

Recommendations:

Drawing from the experience of Shenzhen Smart City, the model can be implemented in Algeria by establishing a smart city initiative that fosters the localization of technology in critical sectors such as electronics, electric vehicles, and alternative energies, by enticing prominent international firms with incentives for knowledge transfer and the establishment of local production facilities.

Optimal integration between academia and the industrial sector can be realized by engaging universities and their students with foreign investor enterprises to promote knowledge transfer. The integration of academic proficiency with sophisticated industrial settings fosters a climate conducive to the formation of start-ups that may use cutting-edge technology and engage

specialists in artificial intelligence, digital industries, and advanced manufacturing. Smart industrial communities are bolstered by research and development centers that foster sustainable economic growth and enhance local innovation.

Investing in networks, data centers, and digital platforms to expedite knowledge transfer and optimize factory operations, while localizing artificial intelligence and Internet of Things technology.

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