

The Impact of Digital Transformation on the Competitiveness of Small and Medium-Sized Enterprises in Algeria

أثر التحول الرقمي على تنافسية المؤسسات الصغيرة والمتوسطة في الجزائر

BOUKHEDIR Wahid

Badji Mokhtar-Annaba

University Algeria

wahid.boukhedir@univ-annaba.dz

HECINI Ibtissem

Mohamed Khider

University of Biskra-
Algeria,

ibtissem.hecini@univ-biskra.dz

***ALMI Hassiba**

Badji Mokhtar-Annaba

University Algeria,

hassiba.almi@univ-annaba.dz

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Abstract :

Digital transformation affects Algerian SMEs' sales, cash collection, customer management, and operations. Recently released Algerian statistics and academic papers are used to assess that effect. It follows the Algerian definition of SMEs as 1–250-person enterprises. The data shows a market shift. Algeria received 5.58 million TPE payments worth DZD 44.56 billion, 19.59 million internet payments worth DZD 51.95 billion, and 58.47 million mobile payments worth DZD 43.59 billion in 2024. In 2025, ARPCE reported 54.87 million active mobile users in the second quarter, with 88.80% on 4G, and Algerie Telecom had 2.5 million fibre subscribers by September. The competitive effect is uneven. Only 19,275 of 77,512 deployed terminals were active in July 2025, according to GIE Monetique. SME competitiveness improves with payment digitalization, process digitization, staff training, and business data utilization.

Key words: digital transformation, SMEs, competitiveness, electronic payments, digital infrastructure.

JEL classification codes:O33;L25 ; G23.

1. Introduction

Small and medium-sized enterprises (SMEs) play a key role in the Algerian economy due to their number, the number of people they employ, and their role in stimulating the local market. However, these institutions operate in an environment characterised by intense competition, rapid technological change, and evolving customer behaviour and payment and marketing methods. In this context, digital transformation has become a direct factor in improving efficiency, enhancing service, expanding market access and accelerating decision-making. This issue is becoming increasingly important in Algeria, given the expansion of the digital infrastructure, electronic payment services and internet access. In recent years, there has been growth in the number of telephone and high-speed internet subscriptions, as well as an increase in the number of electronic and mobile payments. This transformation opens up new opportunities for small and medium-sized enterprises to improve their competitive performance by digitising transactions, organising internal processes, strengthening customer relationships, and basing management on data. The study is based on the main issue that digital transformation has become an important condition for improving the competitiveness of SMEs, but its impact in Algeria is still uneven between one company and another. This variation is linked to several factors, including poor digital readiness, limited training, high adoption costs in some cases, and varying levels of access to infrastructure and digital services. Thus, the research problem is formulated as follows: To what extent does digital transformation enhance the competitiveness of SMEs in Algeria, and what are the most important factors that support or limit this effect?

The study is based on the following hypotheses:

The first hypothesis is that digital transformation contributes to improving the competitiveness of SMEs in Algeria by enhancing productivity, reducing transaction costs, and accelerating service delivery.

The second hypothesis is that the impact of digital transformation on competitiveness increases when the company combines digitalisation of payment methods, digitalisation of internal processes, and training of human resources.

The third hypothesis is that some organisational, technical and human obstacles limit the positive impact of digital transformation on the competitiveness of SMEs in Algeria.

This study aims to achieve a number of objectives. The first objective is to present the conceptual framework for digital transformation and competitiveness within small and medium-sized enterprises. The second objective is to analyse the reality of digital transformation in Algeria based on indicators of electronic communication, payment and digital services. The third objective is to clarify the impact of digital transformation on the competitiveness of SMEs in terms of operational efficiency, market access, service quality and sustainability. The study also aims to identify the main difficulties that hinder this transformation and propose practical approaches to support the competitiveness of these institutions.

The study uses a descriptive analytical approach. This approach involves presenting up-to-date official data on digital infrastructure, electronic payments and small and medium-sized enterprises in Algeria, and then analysing and linking it to the results of recent literature on the subject. The study also refers to national reports and statistics, as well as academic studies that have addressed the relationship between digital transformation and competitive performance.

2. Literature review

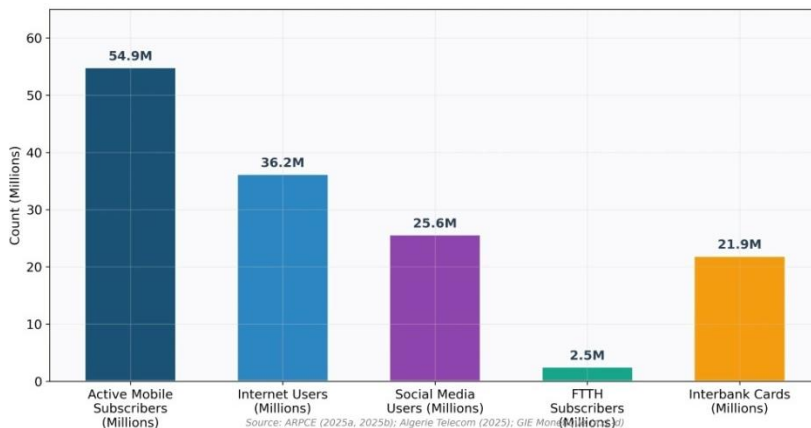
Recent academic work defines digital transformation as a strategic and operational shift that affects external relationships, internal processes, and resource allocation.(Kahveci, 2025)identifies four linked drivers of success: digital awareness, digital strategy and roadmap, digital adoption and implementation, and continuous improvement.(Sagala & Ori, 2024) reach a similar conclusion through a systematic literature review, showing that SMEs need an aligned strategy, gradual implementation, and continuous learning.(Gyamerah, Afshari, & Asante, 2025) add that leadership and employee digital capabilities shape the quality of transformation outcomes. (World Economic Forum, 2024)reports that appropriate digital adoption associates with productivity gains of up to 25 percent and cost reductions of up to 30 percent.This literature helps frame the Algerian case. If digital transformation works, you should expect three signs. First, a steady rise in digital transaction activity. Second, a wider sectoral spread of digital use beyond a narrow service base. Third, a link between digital adoption and everyday business tasks such as payment collection, stock control, invoicing, and customer follow-up. The Algerian data already show the first two signs. The third depends on what firms do inside the business.

The Fourth Industrial Revolution (4IR) presents a broader framework for SME digital upgrading. (Adegbite & Govender, 2021) show that productivity gains, innovation, and internationalization materialize when IIoT, smart manufacturing, and data-enabled decision-making combine with supportive governance and finance ecosystems. For Algerian SMEs, this is not a distant aspiration. It is a frame for reading the payment and connectivity data below.

3. Algeria's Digital Setting for SME Transformation

The institutional setting became more supportive in 2024 and 2025. The Presidency approved the National Strategy for Digital Transformation 2025 to 2030, anchored by five axes: ICT infrastructure, human capital, digital governance, the digital economy, and the digital society(Slaimi & Ouennas, 2026). The strategy sets a target of 80 percent digital adoption by SMEs and a 20 percent contribution of the digital sector to GDP by 2030. The Bank of Algeria issued Regulation No. 25-02 in 2025 to define licensing and operating conditions for payment service providers. These policy moves reduce legal uncertainty and shift the discussion from access to implementation. Algeria's digital infrastructure expanded markedly. Figure 1 shows the key infrastructure indicators for 2025.

Fig 1. Algeria's Digital Infrastructure Key Indicators (2025)

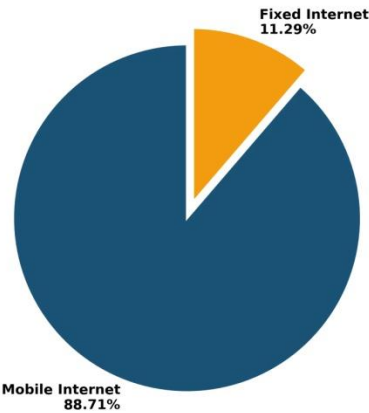


Source: (ARPCE, 2025) ; (Algerie Telecom, 2025)

By early 2025, the country counted 36.2 million internet users, representing a penetration rate of 76.9 percent. Active mobile connections reached 54.8 million, representing a penetration rate of

116 percent. Figure 2 shows how that internet subscriber base breaks down by connection type.

Fig 2. Distribution of Internet Subscribers by Connection Type in Algeria (Q2 2025)



Source: (ARPCE, 2025)

Mobile internet dominates with 88.71 percent of subscribers. Algeria advanced 15 places in the ITU's ICT Development Index in 2025, reaching 74th place globally. Table 1 presents the core digital readiness indicators.

Table 1. Digital Readiness Indicators for SME Transformation in Algeria

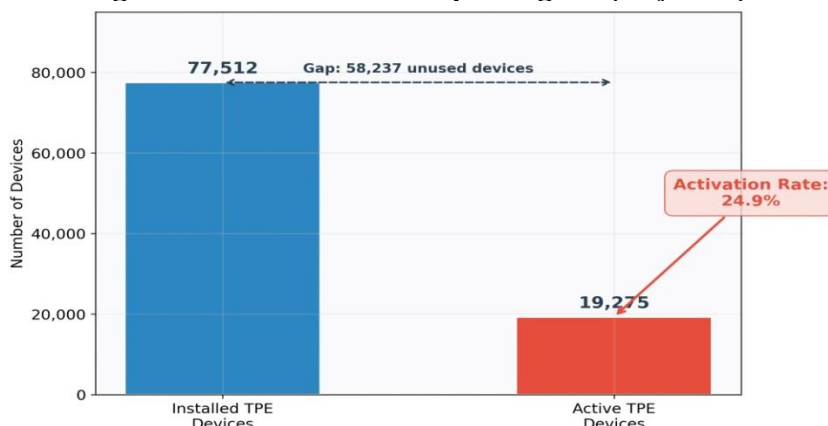
Indicator	Latest Official Value
Share of internet subscribers on mobile	88.71%, Q2 2025
Share of internet subscribers on fixed	11.29%, Q2 2025
Active mobile subscribers	54,874,360, Q2 2025
Share of 4G in the mobile base	88.80%, Q2 2025
FTTH subscribers	2.5 million, September 2025
Interbank cards in circulation	21,899,581, December 2025
Installed TPE devices	77,512, July 2025
Active TPE devices	19,275, July 2025

Source:(ARPCE, 2025) ; (Algerie Telecom, 2025).

Table 1 reveals two facts. First, Algeria has a broad digital access base. 4G is standard for most active subscribers, and fibre expansion

moved fast. Second, business use still lags behind infrastructure. Figure 3 makes this gap concrete.

Fig3. The TPE Activation Gap in Algeria (July 2025)



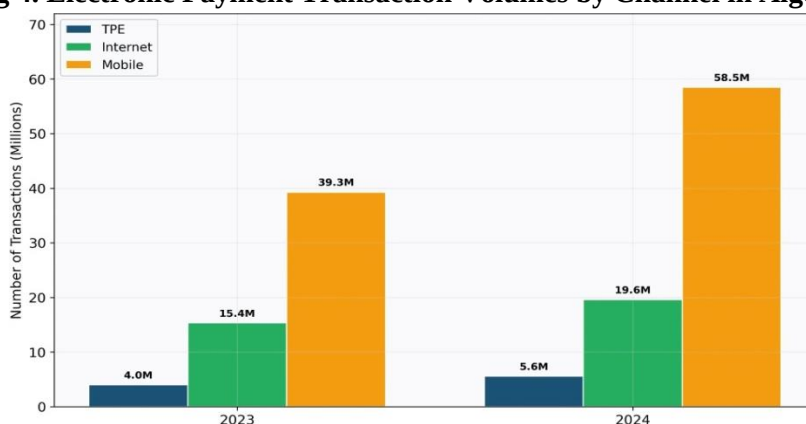
Source: prepared by authors based on (GIE Monetique, 2025)

Algeria had 77,512 installed TPE devices in July 2025, but only 19,275 were active, an activation rate of 24.9 percent. The main issue is no longer access alone. It is activation inside the firm, staff routine, and customer-facing execution.

4. Statistical Evidence on Digital Adoption in Algeria

Electronic payment data provide the clearest measure of actual digital commercial behavior. Customers pay through three distinct channels, each with its own business logic. Figure 4 shows transaction volumes for 2023 and 2024 across all three channels.

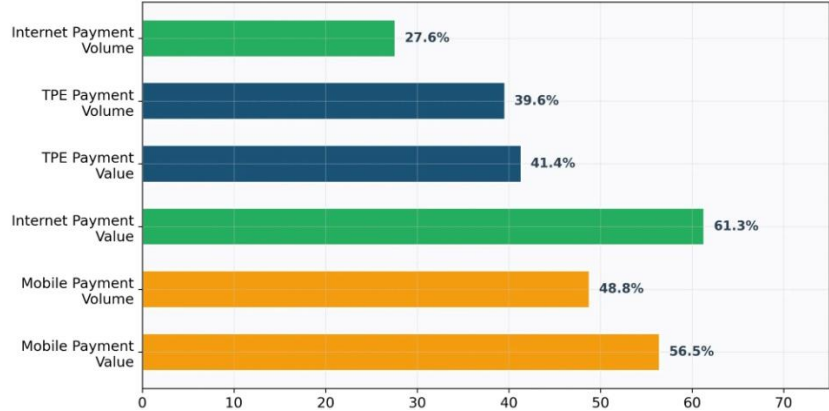
Fig 4. Electronic Payment Transaction Volumes by Channel in Algeria



Source: prepared by authors based on (GIE Monetique, 2025)

Figure 5 shows the year-on-year growth rates that drove these volumes.

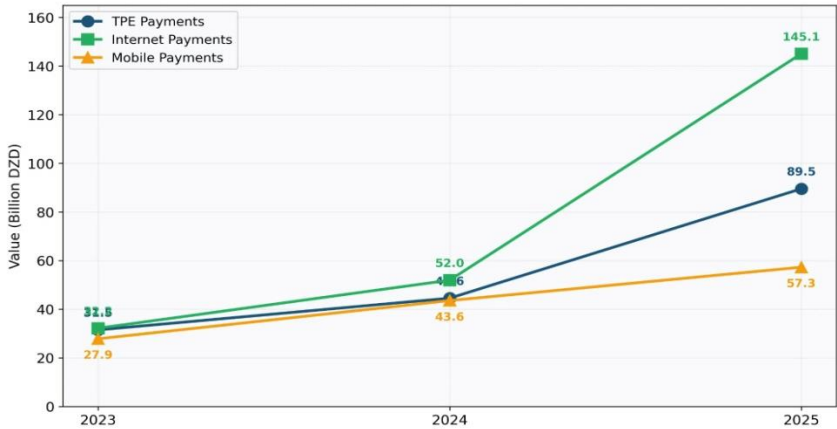
Fig5. Year-on-Year Growth Rates of Electronic Payment Channels



Source: prepared by authors based on (GIE Monétique, 2025)

The 2024 growth rates were already strong. TPE volume rose by 39.6 percent and value by 41.4 percent. Internet payment volume rose by 27.6 percent and value by 61.3 percent. Mobile payment volume rose by 48.8 percent and value by 56.5 percent. Figure 6 shows how payment values evolved from 2023 to 2025 across all three channels.

Fig 6. Evolution of Electronic Payment Values by Channel in Algeria



Source: prepared by authors based on (GIE Monétique, 2025)

The 2025 results strengthened the same direction. TPE value reached DZD 89.5 billion, internet payment value reached DZD 145.1 billion, and mobile payment reached DZD 57.3 billion. Table 2 presents the full data set.

Table 2. Electronic Payment Activity in Algeria by Channel

Channel	2023 Volume	2023 Value	2024 Volume	2024 Value	2025 Value
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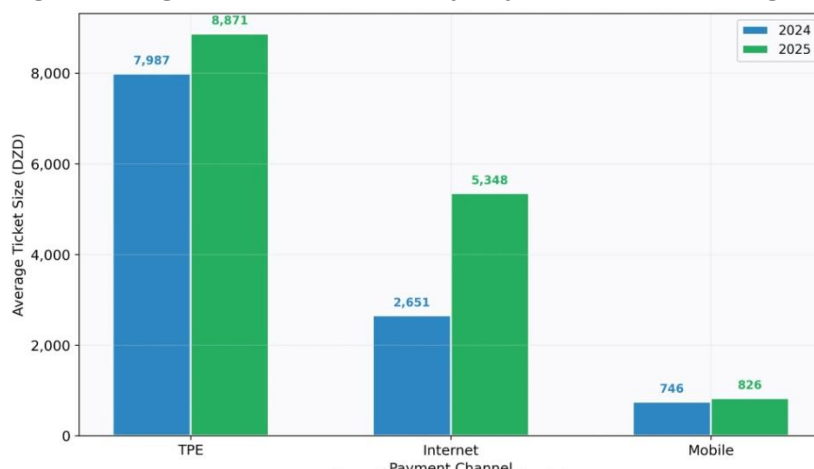
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TPE	3,997,165	DZD 31.52 bn	5,579,708	DZD 44.56 bn	DZD 89.54 bn
Internet	15,351,364	DZD 32.20 bn	19,594,482	DZD 51.95 bn	DZD 145.07 bn
Mobile	39,283,478	DZD 27.86 bn	58,465,858	DZD 43.59 bn	DZD 57.30 bn

Source: prepared by authors based on (GIE Monetique, 2025)

This pattern signals a broader change in customer behavior. Algerian consumers increasingly accept digital payment in-store, online, and through the phone. An SME that does not meet this shift loses speed, data, and part of the market. The three channels carry different average ticket sizes, which matter for SME strategy. Figure 7 compares them across 2024 and 2025.

Fig 7. Average Transaction Value by Payment Channel in Algeria



Source: prepared by authors based on (GIE Monetique, 2025)

Table 3 translates these figures into a competitive reading by matching each channel to SME business types.

Table 3. Average Ticket Size by Payment Channel and Likely SME Fit

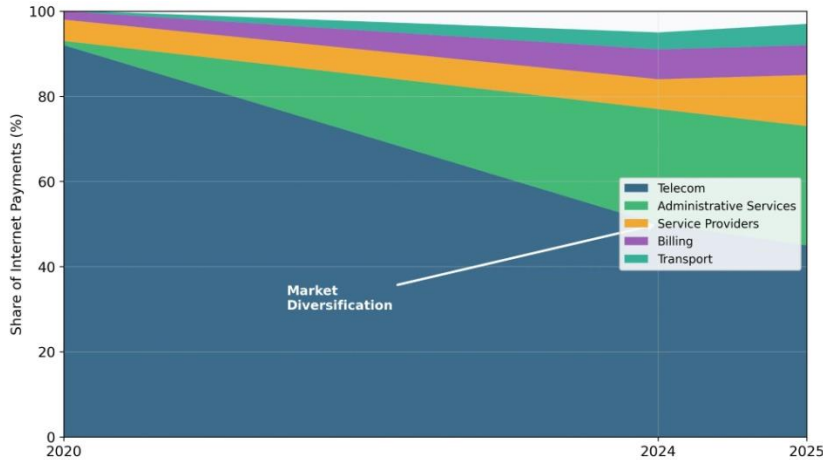
Channel	2024 Avg. Ticket	2025 Avg. Ticket	Likely Business Fit
TPE	DZD 7,986.79	DZD 8,870.89	In-store retail, restaurants, hospitality, pharmacies
Internet	DZD 2,651.03	DZD 5,348.44	Bookings, invoices, online orders, remote services

Mobile	DZD 745.57	DZD 825.79	Daily low-value sales, delivery, micro-retail, QR payment
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Source: author's interpretation.

TPE fits businesses that sell face to face and handle medium-value baskets. Internet payment fits firms that sell remotely or invoice at a distance. Mobile payment fits rapid, small, frequent purchases. These channels are complementary tools matched to customer behavior, not substitutes. The fastest gains often come from a simple fit between tool and transaction pattern, not from a large technology budget. A second trend appears in the composition of internet payments. Figure 8 shows how online payment in Algeria moved away from a narrow telecom base.

Fig 8. Sector Composition of Internet Payments in Algeria (2020-2025)



Source: prepared by authors based on (GIE Monetique, 2025)

In 2020, telecom represented 92 percent of internet payment activity. By 2025, that share fell to 45 percent. Administrative services rose from 1 percent to 28 percent. Service providers rose from 5 percent to 12 percent. Table 4 shows the detailed breakdown.

Table 4. Sector Shares in Internet Payment Activity in Algeria

Sector	2020	2024	2025
Telecom	92%	50%	45%
Administrative services	1%	27%	28%
Service providers	5%	7%	12%

Billing	2%	7%	7%
Transport	0.2%	4%	5%

Source: prepared by authors.

This diversification has a direct implication for SMEs. Public platforms helped normalize remote payment behavior. SMEs benefit from that new habit when they add booking links, remote invoices, subscription payment, and online ordering. Public digital use creates trust. Private firms need to convert that trust into business flow.

Mobile payment also moved into a new phase. GIE Monetique reports that the national mobile switch became operational in June 2024. Interbank mobile payment, branded DZ Mob Pay, launched officially in January 2025 with seven pilot banks. Figure 9 shows account adoption as of January 2026.

Fig 9. DZ Mob Pay Account Adoption (January 2026)



Source: prepared by authors based on (GIE Monetique, 2025)

By January 2026, the system counted 98,519 individual mobile accounts and 14,994 merchant accounts, an individual-to-merchant ratio of 6.6:1. This remains small relative to Algeria's total connected consumer base. The upside for merchant growth therefore remains substantial, especially for SMEs with low ticket values and rapid service cycles.

5. How Digital Transformation Affects SME Competitiveness in Algeria

5.1. Operational Efficiency

Digital payment reduces cash handling, shortens payment confirmation time, and improves traceability. That helps small firms control errors, daily reconciliation, and informal leakage. The effect is strongest when digital payment links to simple accounting and

stock records. Research consistently reports measurable productivity and cost effects when SMEs adopt suitable digital tools (Kahveci, 2025); (World Economic Forum, 2024). Case evidence supports this. A food production SME in northern Algeria that implemented ERP, IoT sensors, and a B2B e-commerce platform reported a 30 percent improvement in operational efficiency and a 25 percent reduction in stock issues within 24 months.

5.2. Market Access

Internet payment growth shows that Algerian customers increasingly accept remote transactions. That matters for training firms, repair services, tourism operators, private clinics, consultants, delivery businesses, and e-commerce sellers. A business that receives payment remotely expands its market beyond the walk-in customer. In a country where mobile internet dominates total internet access, this change has direct commercial value. Condor Electronics, an Algerian electronics manufacturer that invested in digital marketing and its own e-commerce platform, reported a 40 percent increase in online sales within two years.

5.3. Customer Experience

Mobile payment already supports a high number of low-value transactions, suiting the daily rhythm of many Algerian SMEs in retail and services. Faster checkout means shorter waiting time and more completed sales. TPE also matters here because the average ticket is much higher than in mobile payment. A firm that offers both channels serves more customer segments with less friction.

5.4. Managerial Control

Digital transformation becomes competitive when it creates usable records. A payment trace tells you what sells, when demand peaks, which customers repeat, and where stock or service delays appear. (Gyamerah, Afshari, & Asante, 2025) show that leadership and employee digital capability strongly influence whether firms turn digital tools into routines and performance gains. In SMEs, the owner-manager remains decisive. The tool matters. The manager's follow-through matters more. Research on Algerian F&B SMEs confirms that knowledge management improves firm performance, with trust acting as a significant moderating variable (Dahinine, Chouayb, & Bensahel, 2023).

5.5. Resilience

Digitally enabled firms faced a 4-percentage-point lower decline in sales during the COVID-19 crisis compared to digitally constrained firms (IMF, 2020). Post-crisis evidence shows that firms adopting teleworking, e-commerce, and electronic information systems built stronger foundations for future resilience. Digital adoption is not

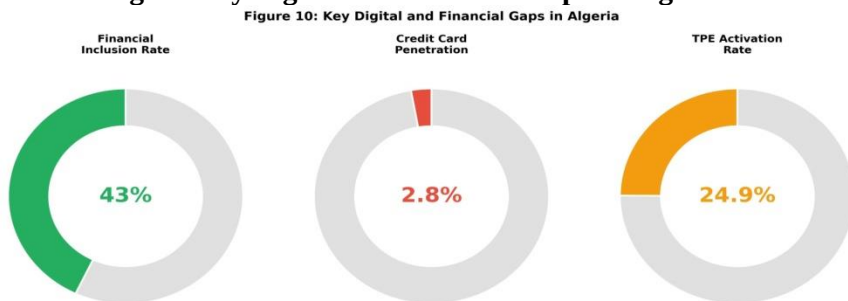
simply a competitive gain in normal times. It is a survival mechanism in turbulent ones.

6. Why the Competitive Effect Remains Uneven

The first barrier is incomplete merchant activation. Algeria has a large connected customer base and a large card base. Yet the TPE network still shows weak active use relative to installed capacity, as Figure 2 shows. That gap means some firms invested in equipment without changing daily practice. They still prefer cash, fail to train staff, or fail to communicate digital payment options to customers. Infrastructure exists but competitiveness does not improve. The second barrier is capability. Research on SMEs repeatedly points to digital literacy, strategy, and continuous learning as basic conditions for success (Sagala & Ori, 2024). A study of 94 Algerian enterprises identified cultural resistance as a major obstacle, a complex phenomenon mixing cultural, organizational, and behavioral factors (ASJP, 2024). The competitive gap between adopters and non-adopters widens even when access improves for everyone.

The third barrier is fragmented adoption. Many firms accept digital payment but stop there. They do not connect payment to inventory, bookkeeping, customer files, delivery tracking, or after-sales. A fragmented approach increases visibility a little but does not change competitiveness much. (Dahinine, Chouayb, & Bensahel, 2023) show that knowledge management improves firm performance most when combined with high internal trust and cross-functional collaboration. The fourth barrier is financial inclusion. Figure 10 quantifies the three core gaps in Algeria's digital and financial ecosystem.

Fig 10. Key Digital and Financial Gaps in Algeria



Source: Fintech Times (2025); GIE Monetique (n.d.-c)

Source: (Fintech Times, 2025)

Financial inclusion stands at 43 percent of adults. Credit card penetration stands at just 2.8 percent. The TPE activation rate is 24.9 percent. These three figures together explain why the digital market remains smaller than infrastructure would suggest. They also define where policy investment has the highest return.

7. Policy and Managerial Implications for Algeria

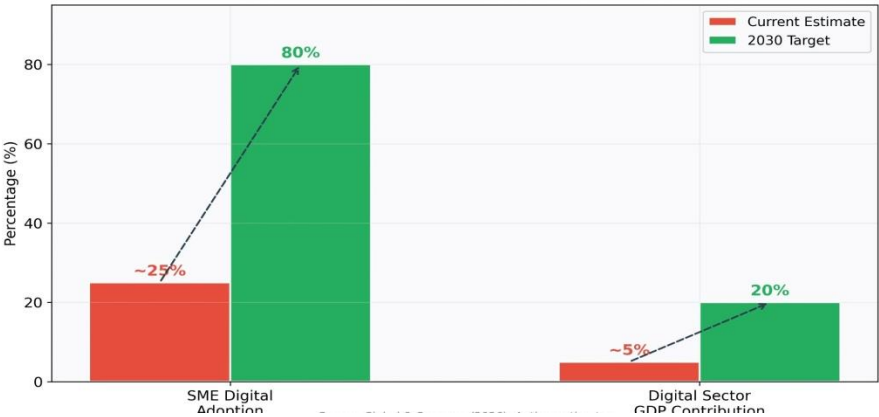
If you run an Algerian SME, start with one business problem that costs you money every week. It may be slow collection, lost remote orders, long checkout time, stock confusion, or poor repeat sales. Then pick the digital tool that fits that problem. Table 5 presents a practical roadmap organized around common business problems.

Table 5. Digital Transformation Roadmap for Algerian SMEs

Business Problem	First Digital Move	ExpectedEffect	First KPI
Slow collections	Add TPE or a payment link	Faster cash cycle	Share of sales paid digitally
Lostremoteorders	Add online catalog and internet payment	Wider marketreach	Online conversion rate
Long checkout time	Add QR or mobile payment	Faster service, more completed sales	Average service time
Poor stock visibility	Link sales to simple inventory	Fewer stockouts and errors	Stock accuracy rate
Weak repeat sales	Keep customer records and follow up	Better retention	Repeat purchase rate
Low staff adoption	Train owner and frontline staff	Fewer daily routine failures	Digital tool usage rate

Source: Author synthesis based on (Kahveci, 2025) ; (Sagala & Ori, 2024) Figure 11 shows the distance between current reality and the 2030 targets of the National Digital Transformation Strategy.

Fig 11. National Digital Transformation Strategy Targets vs Current Reality (2025-2030)



Source: (Slaimi & Ouennas, 2026).

SME digital adoption stands at roughly 25 percent today against a 2030 target of 80 percent. The digital sector contribution to GDP stands at roughly 5 percent against a target of 20 percent (Slaimi & Ouennas, 2026). Public policy should now move from hardware expansion toward active use and business integration. Algeria already has the policy basis. The national digital strategy exists. The Bank of Algeria updated the regulatory base for payment service providers and digital banking. The Ministry of Industry states that its SME support institutions work on modernization, innovation, and competitiveness. The 2025 Law on Digital Trust, approved by the government in November 2025, grants full legal value to digital documents, signatures, seals, and timestamps. It introduces a national digital identity system and defines conditions for trust service providers. This reform is expected to boost confidence in the digital economy and stimulate investment in financial technologies for SMEs (Ecofin Agency., 2025). The next gain will come from merchant activation, sector-specific training, basic cybersecurity support, and simple digital management tools for inventory, invoicing, and customer records. This is where infrastructure becomes productivity.

8. Conclusion

The Algerian evidence points in one direction. Consumers already use digital channels at scale. Infrastructure expanded. Regulation moved. Payment volumes rose across physical, internet, and mobile channels. Yet competitive advantage appears when the firm converts these tools into daily routines.

The SME that combines digital payment, basic data discipline, staff training, and channel fit gains speed, reach, and control. That is where digital transformation affects competitiveness in Algeria today. The SMEs that still prefer cash, skip training, and leave installed TPE terminals inactive fall further behind, not because technology is absent, but because the internal change never happened.

The framework of the National Digital Transformation Strategy 2025 to 2030 is ambitious and well-structured. The targets for 80 percent SME digital adoption and 20 percent GDP contribution from the digital sector set a clear direction. The gap between those targets and current reality is large, but the trajectory is positive. The payment data, the fibre rollout, the regulatory updates, and the emergence of fintech platforms all point to a market that is moving. The firms that move with it will compete. The firms that wait will not.

9. Bibliography List:

- Adegbite, W., & Govender, C. (2021). Emerging roles of small and medium enterprises in the fourth industrial revolution in Africa. *Mediterranean Journal of Social Sciences*, 12(6), 151.
- Algerie Telecom. (2025). *Algerie Telecom reaches 2.5 million fibre optic subscribers*.
- ARPC. (2025). *Observatoire du marche de l'Internet du 2eme trimestre 2025. and Observatoire du marche de la telephonie mobile du 2eme trimestre 2025*.
- Dahinine, B., Chouayb, L., & Bensahel, W. (2023). Knowledge management and firm performance in Algerian F&B SMEs: The role of trust as a moderating variable. *Sustainability*, 15(13), 10074.
- Ecofin Agency. (2025). *Algeria updates digital services and online identity law*. Retrieved from <https://www.ecofinagency.com/news-digital/0511-50150-algeria-updates-digital-services-and-online-identity-law>
- Fintech Times. (2025). *Algeria's fintech ecosystem in 2026: Building momentum*. Retrieved from Fintech Times: <https://thefintechtimes.com/algerias-fintech-ecosystem-in-2026-by-building-momentum/>
- GIE Monetique. (2025). *Activite paiement mobile, Internet and TPE*.
- Gyamerah, S., Afshari, L., & Asante, D. (2025). Digital transformation in the SME context: The nexus between leadership, digital capabilities and digital strategy. *International Small Business Journal: Researching Entrepreneurship*, 43(3), 303-328.
- IMF. (2020). *Harnessing digital technologies to promote SMEs in the MENAP region*. Social Science Research Network.
- Kahveci, E. (2025). Digital transformation in SMEs: Enablers, interconnections, and a framework for sustainable competitive advantage. *Administrative Sciences*, 15(3), 107.
- Sagala, G., & Ori, D. (2024). Toward SMEs digital transformation success: A systematic literature review. *Information Systems and e-Business Management*, 22, 667-719.
- Slaimi, F., & Ouennas, A. (2026). Digital Algeria 2030: An analysis of the digital transformation strategy. *MEST Journal*.

World Economic Forum. (2024). *Digital transformation for SMEs: A strategic framework*.

10. Appendices

Fig12. Key Macroeconomic Indicators for Algeria (2024)

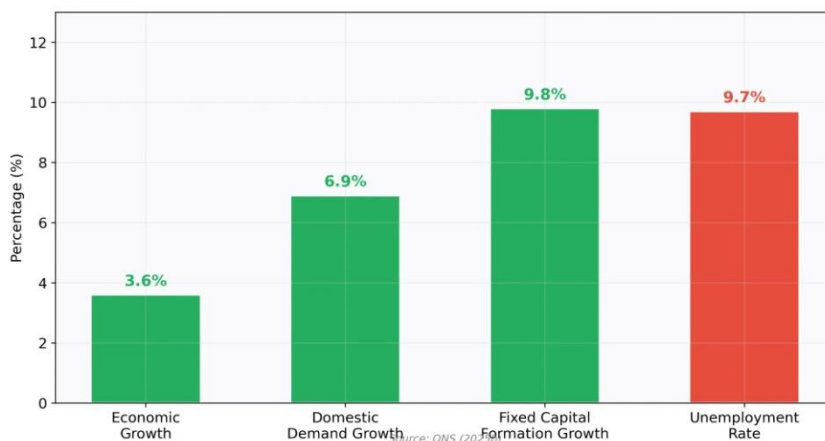


Figure 13. Structure of the Algerian SME Sector (2022)

