LEX LOCALIS-JOURNAL OF LOCAL SELF-GOVERNMENT
ISSN:1581-5374 E-ISSN:1855-363X
VOL. 23, NO. 11(2025)

THE ENTREPRENEURIAL LANDSCAPE IN ALGERIA: CRITICAL ANALYSIS OF OPPORTUNITIES, CONSTRAINTS, AND DEVELOPMENTAL CHALLENGES

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Received: 11/12/2024 ; Accepted : 15/09/2025

Abstract:

Rapid advancements in technology and knowledge-based innovations have fundamentally reshaped work practices, organizational structures, and patterns of economic competition, thereby fostering the rise of digital entrepreneurship. These transformations create significant opportunities for innovation, value creation, and economic diversification.

In the Algerian context, however, entrepreneurs continue to confront persistent challenges, including limited access to financial and technical resources, complex regulatory frameworks, and constrained market opportunities. Despite the existence of government support mechanisms and legal structures aimed at facilitating entrepreneurship, these challenges reveal systemic gaps within the national entrepreneurial ecosystem.

This study, based on a survey of 150 entrepreneurs, aims to identify the principal barriers hindering entrepreneurial activity in Algeria and to examine the strategies and interventions proposed by key stakeholders within the national economic framework. The findings highlight that effective government support combined with the adoption of information and communication technologies (ICT) is essential to fully leverage entrepreneurial potential and to enhance the overall performance and competitiveness of the Algerian economy.

Keyword : Entrepreneurs, ecosystem, Startups, TIC
Jel Classification codes: O30, L26, O14.

Introduction

The use of Information and Communication Technologies (ICT) encompasses a range of processes related to employment, reemployment, innovation, and technical efficiency, aiming to identify the most effective and accurate methods of operation. The concept of systematic ICT usage, emphasizing precision and stepwise processes, has historical roots in military applications, dating back to the First World War (Michel D.C., 1990).

Algeria's interest in ICT and innovative industries dates back to the 1970s. During this period, public institutions allocated budgets for research and development, and numerous personnel were trained in developed countries. However, early results were limited and required periodic adjustments, the first major one occurring in 1994 (Abdelkader D., 1992).

In the early 2000s, following the implementation of Law N° 2000 of 03/08/2000, initiatives aimed at digital transformation multiplied (Journal, 2000). The strategic digitization program "E-Algeria 2008–2013," structured around 13 axes, was implemented, supported by the creation of the FAUDTIC Aid Fund. Simultaneously, technology parks and incubators were established to promote innovation and provide assistance to digital entrepreneurs. To accelerate the modernization of various sectors, new legislation was introduced to ensure continuity in digitization efforts (CNUCED, 2019).

Given the strategic importance of ICT as a source of competitive advantage for Algerian SMEs, this study seeks to identify the key factors influencing ICT adoption. Accordingly, our research question is formulated as follows: What is the effect of external determinants on ICT usage among entrepreneurs in Algeria? The main objective of this study is to examine both internal and external determinants affecting ICT adoption.

This study seeks to address the following research questions:

"What factors influence Algerian entrepreneurs' ability to grow and succeed within the national economic ecosystem?"

To answer this question, the study adopts an explanatory theoretical framework based on analyses situations in different activities, the study proposes the following hypotheses:

H 1: In Algerian economy, the entrepreneurs are not uniform, reflecting variability across different contexts and enterprises.

H 2: there are internal and external determinants impact on entrepreneur's development.

I. Theoretical framework of the research:

I.1 – entrepreneurship:

William Gartner is considered one of the pioneering researchers on entrepreneurial responses. He contributed to numerous studies examining the environmental, cultural, economic, and even political factors that can influence the output generated by entrepreneurs. Gartner particularly focused on the research conducted by Mintzberg regarding the fundamental principles of establishing a new enterprise[1].

Schmitt (2008) proposed the hypothesis that an entrepreneur cannot be defined solely by personal traits. Instead, it is essential to consider the surrounding environment, including supportive family members and workplace partners. The environment plays a crucial role, as it can either enable or hinder the entrepreneur's ability to produce results[2].

I-2 Classification of Entrepreneurs:

Entrepreneurs can be classified according to the type of activity they engage in as well as the prevailing economic system. In developing countries, entrepreneurs are still predominantly active in traditional crafts and simple industries, whereas in developed countries, they tend to specialize in advanced agricultural industries, technology, and innovation. Each country can be categorized based on the aggregation of enterprises according to their products and the sector in which they operate. Consequently, the following classification can be observed[3]:

Table (1-1): Classification of Entrepreneurs

Authors	Year	Classification of entrepreneurs
Smith	1967	1. Craft Entrepreneur 2. Opportunistic (Chance) Entrepreneur
Collin and Moore	1970	1. Managerial Entrepreneur 2. Independent Entrepreneur
Laufer	1975	1. Innovative Entrepreneur 2. Production-driven Entrepreneur 3. Efficiency-driven Entrepreneur 4. Craft Entrepreneur
Miles and snow	1978	1. Developer Entrepreneur 2. Innovative Entrepreneur 3. Monitor Entrepreneur 4. Reactor Entrepreneur

[1] Emile-Michel H, 1995**" L'Entrepreneuriat comme processus "**Article, Revue internationale PME, P 108

[2] Laviolette E, 2015 " **Leadership entrepreneurial : une analyse comparée du leadership et de l'entrepreneurship** " Article, Journal of Research gate, P 03.

[3] L.J.Fillion, 2000, Typologie d'entrepreneur - Est-ce vraiment utile, Cahier de recherche no 2000-14 P4

Vesper	1980	1. Independent Entrepreneur 2. Team Member Entrepreneur 3. Independent Innovator 4. Stimulator Entrepreneur 5. Peace Economy Entrepreneur 6. Capital Accumulating Entrepreneur 7. Acquiring Entrepreneur 8. Trading Entrepreneur 9. Manufacturing and Construction Entrepreneur 10. Prominent Entrepreneur 11. Value-Driven Manager
Julien	1987	1. Sustainability, Profitability, Growth 2. Growth, Leadership, Sustainability
Carlandn hoy and Carland	1988	1. Entrepreneur 2. Owner of a Small or Medium Enterprise
Lafuente and Salas	1989	1. Craft Entrepreneur 2. Adventurer Entrepreneur 3. Family Business Entrepreneur 4. Businessman
Filion	1998	1. Applied Entrepreneur 2. Guided Entrepreneur
Marchesnay	1998	1. Isolated Entrepreneur 2. Natural Entrepreneur 3. Recognized Entrepreneur 4. Adventurous Entrepreneur
Duchéneaut	1999	1. Adventurer (28%) 2. Mature Entrepreneur (41%) 3. Enlightened Entrepreneur (25%) 4. Novice Entrepreneur (6%)

Source : L.J.Fillion, 2000, Typologie d'entrepreneur - Est-ce vraiment utile, Cahier de recherche no 2000-14, P4

1-3. Entrepreneurship in Algeria:

1. **Entrepreneurship in the Post-Independence Period (1962–1979) :**

During this period, Algeria adopted a socialist economic system, with approximately 70% of the economic structure consisting of state-owned enterprises operating primarily in heavy industries. The private sector was largely confined to traditional crafts, food production, and the distribution of goods within limited family networks. Consequently, the contribution of the private sector remained limited and not yet clearly visible. According to Peneff (1982), three distinct types of industrialists emerged during this phase: [4]

a. Commercial Entrepreneurs

This category includes traders engaged in the sale of consumer goods (such as merchandise, textiles, etc.) to individuals or workshops. Most of these entrepreneurs were middle-aged or elderly and benefited from the 1966 Investment Promotion Law. They were predominantly from regions such as Tizi Ouzou, Beni Mzab, and Oran, due to the ease of sourcing goods from Morocco and Europe. A second subgroup consisted of distributors or exporters who managed the products supplied either by the first group or by local workshops, redistributing them across other regions of the country. Most of these distributors came from Beni Mzab, Oued Souf, M'sila, and Biskra and often engaged in trade with partners in Tunisia and the southernmost areas of Algeria.

b. **Non-Managing Entrepreneurs:**

[4] Peneff J1982," **Carrières Et Trajectoires Sociales Des Patrons Algériens** " Article , Revue Actes de la recherche en sciences sociales, vol 4 P 63

This type refers to partnerships between property or capital owners and individuals with managerial expertise, whether Algerian or foreign, who operated the factories or workshops.

c. Employee Entrepreneurs

This group comprised employees from the government or military sectors who entered entrepreneurship to supplement their income and improve their standard of living. They were primarily active in industrial maintenance and targeted lower-income populations.

2. Entrepreneurship during the (1980–2000) Period

During this phase, Algeria experienced a significant shift in its economic system, marked by early signs of market liberalization and support for the private sector, particularly following the 1986 economic crisis. The International Monetary Fund (IMF) imposed legal and financial measures to encourage partnerships with state-owned enterprises and foreign investment, aiming to foster competition and improve product quality. The entrepreneurial trend became particularly evident after the 1997 Finance Law, which activated mechanisms to support entrepreneurship through institutions such as ANJEM, ENSEJ, and CNAC. According to Benachenhou (2007), individuals engaged in entrepreneurship during this period can be classified into five types[5]:

1. **Retired Entrepreneurs:**

This group consisted of retired managers from national enterprises who possessed extensive managerial experience. Their motivation was either to supplement their pensions or driven by a passion for work.

2. **External Entrepreneurs:**

These were entrepreneurs returning from abroad who established business partnerships within Algeria.

3. **Young Entrepreneurs:**

These individuals inherited family industries and sought to modernize traditional production techniques to preserve their craft, such as in the case of the soft drinks industry (e.g., Hamoud Boualem).

4. **Temporary Worker Entrepreneurs:**

Comprising laid-off employees or those whose contracts had ended, these individuals were compelled to enter trade as a means of securing income during periods of forced unemployment, particularly during the 1988–1992 economic crisis.

5. **Imitative Entrepreneurs:**

This group included entrepreneurs who copied existing products or business techniques with the goal of generating quick profits, frequently changing their business activities.

2. Entrepreneurship during the (2001–2019) Period:

This period can be divided into two phases. The first phase corresponded to an economic boom, driven by a rise in oil prices, which reached $120 per barrel in 2003[1].

This growth encouraged numerous government economic programs aimed at supporting youth and reducing unemployment. Measures included the reactivation of youth employment agencies, the establishment of support funds, and the provision of short-term loans. University graduates were specifically targeted and granted facilitation to establish diverse projects, resulting in an increase in the number of small enterprises from 43,213 in 2000[2] to 777,259 in 2013 [6]

The second phase was characterized by a decline in oil prices, particularly from 2016, leading to economic fluctuations that persisted until 2019[7]. This situation led to the decline of many entrepreneurial ventures due to increased competition and existing structural barriers. However, the

[5] Benachenhou, A, 2007 **" les entrepreneur Algériens "**, livre, Edition alpha désigh, page 68
[6] Bulletin d'information statistique de la PME, N°25.Novembre 2014 P09
[7] https://fr.statista.com/statistiques/564926/prix-annuel-du-petrole-de-l-opep-1960-2020

development and adoption of digital platforms facilitated the emergence of new enterprises, resulting in a total of 1,171,945 active businesses across various sectors by 2019

Overall, despite the availability of support programs and institutions promoting various forms of entrepreneurship, their contribution to the national economy remains limited. Moreover, these supports are heavily dependent on oil revenues, which experienced significant declines between 2013 and 2019, causing the GDP growth rate to fall from 3.8% in 2013 to 0.7% in 2019[8].

Simultaneously, amid a challenging global economic environment, Algeria faced an internal political crisis that delayed the implementation of numerous projects. This was subsequently compounded by a global crisis in the form of the COVID-19 pandemic. The pandemic's rapid spread coincided with advancements in fifth generation (5G) technologies, notably developed by companies such as Huawei. Countries with advanced information and communication technologies leveraged these innovations, employing artificial intelligence and real-time data tracking to develop effective solutions for monitoring and controlling the outbreak[9].

Algeria, with an import-dependent economy and facing dual crises, was compelled to implement strict containment measures as the pandemic worsened. The country had to seek alternative approaches to education and work, placing small enterprises at high risk of bankruptcy. This situation revealed the fragility of Algeria's economic fabric, with GDP contracting by -5.2%[10] This situation compelled the government to provide financial support to both large and small enterprises, effectively pushing them toward digital transformation.

I.2 Support Institutions for Algerian Entrepreneurs in the Field of Information and Communication Technology (ICT) :

1- Cyber-Parc Sidi Abdellah

Located in Algiers, Cyber-Parc Sidi Abdellah is the first national technology park in Algeria, established in 2009. It provides a variety of incentives for small and medium-sized enterprises, start-ups, and innovative entrepreneurs operating in technology sectors. The park hosts initiatives supported by major companies such as GE, Siemens, and Huawei, particularly in fields like solar panels and underground fiber optic cables.

Within the park's facilities, there are 35 small enterprises and a Mobilis contact center (ATM) connected to a fiber optic network. In addition, the Information and Communication Technology Research and Studies Center (CERTIC) is located on-site. CERTIC's mission is to consolidate all research and studies in the ICT field. It is equipped with a high-performance computing center to meet the substantial computational needs of certain start-ups, particularly those operating in the meteorology sector[11].

Regarding support provided by technology parks, opportunities arising from partnerships with the European Union were leveraged by the National Agency for the Promotion and Development of Technology Parks (ANPT). Within its 2010–2014 five-year development plan, ANPT aimed to establish three additional regional technology parks in Ouargla, Annaba, and Oran, respectively.

2- The Ouargla Technology Park, established in 2012[12], It serves as a tool to promote industrial activities related to hydrocarbons and electronics. In 2018, an innovative incubator was established within the park, hosting approximately 16 student entrepreneurs with innovative projects[13].

[8] Confédération, 2020, rapport sous thème : « Rapport Economie d'Algérie », département des affaires étrangers, Suisse. p

[9] www. elArabia.com/covid-19/ae/2020.

[10] Banque mondial 2020

[11] Rapport Jumelage 2010-2014, www.anpt .dz

[12] https://anpt.dz/projet-detail/technoparc-regional-ouargla consulter le 02/05/2020

[13] https://anpt.dz/projet-detail/technoparc-regional-annaba , consulter le 02/05/2020

3- **The Annaba Technology Park**, established in 2011[14] Its mission is to strengthen existing industrial centers in eastern Algeria, particularly those active in biotechnology, metallurgy and steel production, and petrochemicals.

4- **The Oran Regional Technology Park (Technobridge)** :

focuses on strengthening existing industrial centers in western Algeria, particularly in petrochemicals, textiles, plastics, and agro-food sectors. Additional technology parks are planned for other regions, including Sétif, Batna, Constantine, and Boughezoul, as part of the mission to promote entrepreneurship and innovation. These initiatives are supported through business incubators and university-based entrepreneurship centers[15]. All of these facilities store their data in the agency's cloud data center and are equipped with advanced cybersecurity technologies.

I.4 The Shift of Algerian Entrepreneurs Toward Information and Communication Technology (ICT) During the Pandemic :

According to a study conducted by the Evidencia Foundation (2020), in the year 2020, 22% of small and medium-sized enterprises (SMEs) in Algeria laid off their employees as a result of the losses incurred due to lockdown measures, border closures, and travel restrictions, which led to a 68% decline in their turnover[16].

For its part, the World Bank reported on the situation of startups in Algeria in 2021 and how they coped with the pandemic, noting a 58% decrease in sales compared to the same month in 2020. This indicates that more than half of them (51%) incurred losses exceeding 50%, and many of these firms were unable to withstand the crisis[17].

Furthermore, the General Association of Algerian Contractors (AGEA) confirmed that in 2021 alone, 5,700 small enterprises were forced to close, leading to the layoff of 150,000 workers. Additionally, 21% of firms did not resume their activities and postponed them until after the crisis, while 12% of the enterprises that resumed operations laid off 12% of their workforce[18].

In an exploratory study conducted by CREAD (2020), startups operating in the categories of trainees and self-employed professionals were the most affected by job losses. Specifically, 20% of trainees, 14% of self-employed workers, 7% of employees, and 6% of employers surveyed lost their jobs since the onset of the pandemic[19].

1.5 Policy measures adopted by Algeria to alleviate the impacts of the pandemic crisis :

Corrective measures were rapidly introduced from multiple directions. The Managed Youth Center proposed to the Ministry of Industry and Mines a framework for supporting and assisting enterprises facing difficulties. These measures were organized into three groups to be implemented across two phases: during the lockdown, to ensure the payment of workers' wages, and after the lockdown, to enable enterprises to restart their activities.

Regarding enterprises experiencing specific difficulties, the proposed measures included the provision of allowances financed by the National Unemployment Insurance Fund or a special COVID-19 fund, the maintenance of social security contributions and health insurance coverage until

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[14] https://anpt.dz/projet-detail/technoparc-regional-oran Consulter le 02/05/2020

[15] Oxford business groupe, 2018, **" Algérie 2018"** , Rapport sur https://oxfordbusinessgroup.com/ consulter 02/06/2020

[15] KAOUANE H, 2020, **"Covid-19 Une opportunité pour développer l'écosystème Algérien "**, Rapport PNUD https://www.undp.org/fr consulter 02/06/2020

[16] Théodore Levitt, 2020 **"Impact Économique Du Coronavirus Sur Les Entreprises Algériennes"**, Rapport Evidencia , Business Academy, Espagne, p 09.

[17] Rapport PNUD2021 p 12

[18]https://www.reporters.dz/leffet-covid-sur-le-tissu-entrepreneurial-en-2020-mesure-par-le-cread-entreprises-algeriennesle-choc-pandemique/

[19] Rapport CREAD2020 p 412.

June 2020, and the postponement of loan installment payments until 1 September 2020 for loans granted to workers, with repayment rescheduled over a period ranging from 0 to 12 months.
These measures also involved state-backed facilitation mechanisms enabling firms to meet their financial obligations. The value of such loans could be set between 20% and 25% of the enterprises' turnover for the year 2020[20].
On the other hand, the authorities postponed the payment of taxes and social security contributions, extended reporting deadlines, and introduced tax rate reductions, as well as exemptions from or waivers of late payment penalties and, in some cases, advance payments. Specifically, these support measures included:

1- Exemption of startups from the Apprenticeship Tax (APR), Value Added Tax (VAT), Personal Income Tax (IRG), Corporate Income Tax (IBS), and the Single Flat Tax (IFU) during the first three years of actual operation. Article 42 of the Supplementary Finance Law for 2020 provides for an amendment to Article 69 of the Finance Law, which addresses tax exemptions granted to startups.

2- A three-year exemption from the start of activity for startups when acquiring the equipment necessary for the implementation of their investment projects (computer equipment, office equipment, etc.).

3- It should be noted that the Finance Law for 2020 subjects electronically conducted sales transactions to a reduced value-added tax rate of 9%, in accordance with Article 42 of the 2020 Finance Law. This provision also applies to deliveries made by a taxable person established outside Algeria[21].

In order to ensure survival for as long as possible, the majority of entrepreneurs turned to online marketing through social media platforms[22].

In order to ensure business survival for as long as possible, most entrepreneurs turned to electronic marketing through social media platforms. For instance, the Yassir application, developed by the transportation company Yassir, which was launched in 2017, succeeded during the pandemic in enhancing its application and expanding its services beyond transportation to include goods delivery, food purchasing, and the transportation of medical personnel, among others. As a result, the company found itself facing rapid competition by mid-2020 [23].

Statistics regarding small enterprises in 2021 show the following:

Table (3-1): Indicators of Small Enterprises in Algeria During the Pandemic

Year	Total Enterprises (Public – Private)	Public	Private	New Enterprises	Workforce
2020	1,209,491	239	1,209,252	15,720	2,920,769
2021	1,267,220	225	1,267,220	33,758	3,083,503

Source : https://www.industrie.gov.dz/IMG/pdf/Bulletin_PME_N_35_vf.pdf

[20] https://www.aps.dz/ Consulter juillet 2020
[21] Loi de finances 2020 P13.
[22] Fond monétaire, 2021, Rapport sous thème : « Consultation de 2021 au titre des articles IV -Communiquer de presse – Rapport des services du FMI- Déclaration de l'administration pour l'Algérie », Fond Monétaire international, Washington. P4.
[23] https://www.jeuneafrique.com/1324997/economie/algerie-plus-de-750-start-up-labellisees/ 2022 consulter qvri 2022

During the pandemic, the number of private small enterprises **increased by 1,084% compared to 2019**, before decreasing to **1,011% between 2020 and 2021**. These enterprises were mainly concentrated in the **services, industry, and technology sectors**. This growth is largely attributed to the use of **social media platforms for digital marketing** during the pandemic. However, many of these enterprises can be considered **"opportunistic" ventures**, aiming to generate some income rather than being part of a genuine industrial or commercial sector.

II. Literature review

Research shows that entrepreneurs to compete grow, especially for start-ups and SMEs. Studies highlight that both personal traits (self-efficacy, personality, intuition, competitiveness) and functional traits (education, skills, access to devices and networks) strongly influence an entrepreneur's intention and ability to adopt digital technologies. So ICT is the important to survive, we fiand Trianggoro Wiradinata (2017) found that personal and functional traits directly affect start-ups' s evolution in another hand the study od Muhammad Ragil Fahriawan (2020) showed that, device availability, and mobile networks significantly drive m-commerce adoption among SMEs to continue their development. Also Zaremohzzabieh et al. (2015) demonstrated that the one solution for rural young entrepreneurs, is to developpe their skills in technology for surviving with this crisis.

III. Discussion results:

1- Entrepreneurs' Field Experience:

To examine whether there are differences in respondents' opinions regarding the determinants influencing their use of ICT, the study considered the entrepreneurs' field experience categorized as: less than 3 years, 4–5 years, 6–10 years, and more than 10 years. The same procedure described previously was followed, including testing for normality to determine the appropriate statistical test.

A. Test of Normality

The normality of the data was tested using Kolmogorov-Smirnov and Shapiro-Wilk tests at a significance level of 0.05.

Table (4-1): Normality Test Results by Entrepreneurs' Field Experience

Field Experience	Kolmogorov-Smirnov Significance	Shapiro-Wilk Significance	Result
Less than 3 years	0.000	0.000	Non-normal
4–5 years	0.000	0.000	Non-normal
6–10 years	0.000	0.000	Non-normal
More than 10 years	0.000	0.000	Non-normal

Source: Prepared by the author based on SPSS v26.0 outputs

The results indicate that only the specialized technical position among six job categories showed a significance level greater than 0.05 (Kolmogorov-Smirnov = 0.200; Shapiro-Wilk = 0.064), implying normal distribution. All other categories had significance levels below 0.05, indicating non-normality. Thus, for most categories, H0 is rejected in favor of H1.

B. Kruskal-Wallis Test

To determine differences in opinions among respondents regarding determinants influencing ICT use according to field experience, the Kruskal-Wallis test was applied.

Table (4-2): Kruskal-Wallis Test Results by Field Experience

Dependent Variable	Field Experience	N	Mean Rank	Kruskal-Wallis Statistic	df	Significance
Determinants influencing ICT use	<3 years	3	196.17	2.508	3	0.474
	4–5 years	30	146.67			
	6–10 years	63	149.02			
	>10 years	223	164.41			

Source: Prepared by the author based on **SPSS v26.0 outputs**

Since the test statistic (2.508) corresponds to a significance level of 0.474, which is greater than 0.05, H0 is accepted. This indicates no statistically significant differences in opinions regarding determinants influencing ICT use based on entrepreneurs' field experience in the study sample.

2. Use of Modern Devices

To assess differences in opinions based on whether entrepreneurs use modern devices, normality tests were conducted first, followed by the appropriate non-parametric test.

Table (4-3): Normality Test Results by Use of Modern Devices.

Use of Modern Devices	Kolmogorov-Smirnov Significance	Shapiro-Wilk Significance	Result
Yes	0.000	0.000	Non-normal
No	0.000	0.000	Non-normal

Source: Prepared by the author based on SPSS v26.0 outputs

B. Mann-Whitney Test

The Mann-Whitney U test was used to compare opinions between entrepreneurs who use modern devices and those who do not.

Table (4-4) : Mann-Whitney Test Results by Use of Modern Devices

Dependent Variable	Device Use	N	Mean Rank	Sum of Ranks	U	Significance
Determinants influencing ICT use	Yes	277	167.60	46424.50	3712.50	0.000
	No	42	109.89	4615.50		

Source: Prepared by the author based on SPSS v26.0 outputs

Since the U value corresponds to $p = 0.000 < 0.05$, H0 is rejected in favor of H1. Entrepreneurs using modern devices support the ICT determinants framework more strongly than those who do not.

3. Websites and Software Used

To evaluate differences based on the type of websites and software used (corporate website, social media, e-transaction apps, specialized software, diverse communication tools), normality was first tested.

Table (4-5): Normality Test Results by Website/Software Used

Website/Software	Kolmogorov-Smirnov Significance	Shapiro-Wilk Significance	Result
Corporate website	0.000	0.000	Non-normal
Social media	0.000	0.000	Non-normal
E-transaction apps	0.000	0.000	Non-normal
Specialized software	0.000	0.000	Non-normal
Diverse communication tools	0.000	0.000	Non-normal

Source: Prepared by the author based on SPSS v26.0 outputs

B. Kruskal-Wallis Test

Table (4-6): Kruskal-Wallis Test Results by Website/Software Used

Dependent Variable	Website/Software	N	Mean Rank	Kruskal-Wallis	df	Significance
Determinants influencing ICT use	Corporate website	30	159.60	31.144	4	0.000
	Social media	27	156.43			
	E-transaction apps	190	176.72			
	Specialized software	39	147.87			
	Diverse communication tools	33	81.36			

Source: Prepared by the author based on SPSS v26.0 outputs

Since **p = 0.000 < 0.05**, H0 is rejected. A **post-hoc Mann-Whitney test** identified the sources of differences:

- Corporate websites vs. diverse communication tools
- Social media vs. diverse communication tools
- E-transaction apps vs. diverse communication tools
- Specialized software vs. diverse communication tools

The empirical findings partially support the hypotheses regarding the influence of entrepreneurs' personal and functional characteristics on the producers of their projects.

1. Influence of Functional vs. Personal Characteristics:

which proposed that entrepreneurs' functional characteristics (field of activity, position, number of employees, work experience, use of modern devices, websites, and software) affect the volume of production and efficacity of process, whereas personal characteristics (gender and age) have no significant effect. This suggests that operational competencies' resources play a more critical role than demographic factors in entrepreneurial practices.

2. Relationships between external Determinants and internal determinants :

Which significant positive determinants affecting entrepreneurs activities include: reliability of ICT, government support incentives and entrepreneur's competence .

IV. Conclusion

The results of this study confirm that entrepreneurs in Algeria are sctive in theirs sectors influenced by, personal skills and policy support and technological infrastructure are key to promoting ICT integration, whereas demographic factors and individual competencies play a secondary role.

In conclusion, the actual entrepreneurs in Algeria follows a cumulative process: reliability and supportive incentives. These findings partially confirm the research hypotheses and highlight the importance of functional and contextual factors in entrepreneurs' activity and surviving.

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