The Emergence of Pharmaceutical Entrepreneurship in Algeria: A Case Study of a Cosmetics Company

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Summary: This exploratory study examines how the cosmetics sector can promote the emergence of pharmaceutical entrepreneurship in Algeria, focusing on the start-up "IMENIUM BIO", based in the Mascara province and specializing in natural cosmetics. It uses a qualitative approach based on interviews with the company's director and an analysis of information from its official website. The study highlights the importance of scientific capital, investment in R&D and artificial intelligence in stimulating innovation. The conclusion highlights the importance of adopting incentive policies and developing training programs for students in the health sciences, as well as encouraging research into local medicinal plants, which represent an opportunity for economic diversification. By embarking on these initiatives, Algeria could not only revitalize its pharmaceutical and cosmetic sectors but also diversify its economy, moving away from its dependence on hydrocarbons.

Keywords: cosmetic; startup; pharmaceutical industry; entrepreneurship; emergence
Jel Classification Codes : L65, L26

I- Introduction :

The pharmaceutical industry has gained increasing attention, particularly in the aftermath of the COVID-19 pandemic(Jou et al, 2024; Jou &Datoussaid, 2023; Jadhav et al., 2021; Ranjit et al. 2020; Fabien Deruelle, 2022), which highlighted the unequal access to essential medicines, especially in developing countries(Hamadi et al. 2021). The global health crisis exposed vulnerabilities in the supply chains and the dependence of many nations on a few pharmaceutical giants (Jou et al, 2024). As a result, many countries, particularly in the Global South, were deprived of timely and affordable access to life-saving medications and vaccines. This has spurred a renewed focus on developing local medicinal industries to reduce reliance on external suppliers and ensure equitable access to healthcare products in future crises (Datoussaid et al., 2021). In this new context, the entry of startups into the pharmaceutical industry has been relatively modest compared to other sectors (startup ranking, 2024). While there, has been notable innovation in areas such as biotech and health technology, the Pharma industry remains dominated by large, established companies with significant financial and research capacities. Startups often face high barriers to entry, including the need for substantial capital, regulatory approvals, and long development cycles for new drugs (Alan, 2008). However, the growing demand for affordable and accessible medicines, especially in emerging markets, has started to create opportunities for startup to carve out niche roles in the industry, particularly through partnerships with larger firms or by focusing on technological advancements such as AI-driven drug discovery and personalized medicine (Chaitanya et al. 2024).

In Algeria, the Pharma Manufacturing is expanding rapidly and aims to increase local production to meet the growing needs of the national market and reduce dependence on imports (Hamadi& Datoussaid, 2015). By 2023, around 68% of the pharmaceuticals consumed in Algeria were

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produced locally, primarily in the form of generics (Hamadi, 2013; Hamadi et al., 2017), largely due to the involvement of the SAIDAL Group. Although this production is growing, the sector faces major challenges, particularly in terms of quality (Tareck, 2022), compliance with international standards and research and development (Nasreddine, 2020). Given the substantial capital required in the Drug-related field, Algerian startup are increasingly redirecting their investments toward the less costly cosmetics manufacturing to meet evolving consumer expectations. Consumers are showing a growing interest in vitamin-enriched cosmetic products, reflecting significant cultural and behavioral shifts. Simultaneously, the Algerian government supports the Drug-related sector through incentive policies aimed at encouraging investment, modernizing infrastructure, and promoting international partnerships, providing growth prospects in response to rising demand. In this context, our paper seeks to explore the following primary question: How can the cosmetics sector promote the emergence of pharmaceutical entrepreneurship in Algeria?

The structure of the article is as follows: The first section provides a literature review on startup in the pharma manufacturing, specifically within the cosmetics sector. The second section outlines the methodology used in this study. The third section presents a discussion of the empirical results, while the final section offers recommendations and a conclusion that highlights how the cosmetics sector can serve as a catalyst for the blossoming of pharmaceutical entrepreneurship in Algeria.

I. Literature review: Start-ups in the Pharmaceutical and Cosmetics Industry

I.1. the pharmaceutical industry in start-ups: a global view

The medicinal industry has witnessed significant growth worldwide, driven by the increasing demand for medications and healthcare products. This sector stands out as the top spender on research and development, allocating 16% of its revenues to R&D efforts (Fabrizio, Federica, 2021). In comparison, companies in the technology and telecommunications sectors invest 13% of their revenues in research and development (Fabrizio C et al., 2021). This substantial investment in innovation underscores the critical role of the medicinal industry manufacturing in advancing medical treatments and meeting global healthcare needs. The COVID-19 pandemic prompted Drug-related companies to embrace open innovation, fostering greater collaboration and knowledge-sharing across the industry (Jou et al, 2024). Faced with urgent global healthcare challenges, many companies partnered with research institutions, governments, and even competitors to accelerate the development of vaccines and treatments, highlighting the importance of collective efforts in addressing public health crises (Robcke at al., 2020).

Startup, given their unique characteristics compared to other companies—such as their reliance on innovation, rapid market entry, entrepreneurial culture, and readiness to face potential risks and new challenges—are considered promising players in the pharma manufacturing (Alan, 2008). However, what limits their entry into this sector is the lack of resources and brand credibility. This necessitates forming partnerships with other companies to scale their operations (Filson, Oweis, 2010). Statistics indicate that 68% of the world's largest 500 public companies have partnerships with startup (Bonzom, Netessine, 2016). Some startups, in order to overcome the challenge of limited financial resources, may turn toward other pharmaceutical-related activities, such as cosmetics production, or rely primarily on government support (Puglieri et al., 2022). However, the literature addressing the shift of startup towards the pharmaceutical manufacturing is relatively limited compared to other sectors (Fabrizio et al., 2021; Siota et al., 2020; Prats et al., 2019). Moreover, the literature specifically focusing on the shift of startup towards the cosmeceutical industry is almost nonexistent.

I. 2. Algerian Startups in the Cosmetics Industry: Current state of play

Algeria holds an important position in the global ranking of start-ups, having been classified among the top 20 countries in the world. As of 2023, it ranks 17th globally and first in Africa, with 812 start-ups. This achievement places Algeria ahead of several developed countries, such as Japan and Sweden, as well as emerging countries like China (Starup Ranking, 2023).The establishment of start-ups in Algeria has witnessed a significant increase in recent years, with their number rising by 228% between 2021 and 2023.In the ranking of the top 100 start-ups in the world, Algeria was not included in this list. Open AI (Aydın, Karaarslan 2022; Konstantinos, Roumeliotis, 2023) topped the global ranking, while the India (03 companies), United States (02), the United Kingdom (02), Australia (01), Switzerland (01) and Bulgaria (01) dominated the top 10 start-ups worldwide. The

top start-up in Algeria was ranked 765th globally, which is the company Yassir, followed by the companies Siamois QCM, legal doctrine, Herd Academy, Zawwali, Talabastore, Batolis, MdinJdida, Dzostad.com and Spart, making up the top five Algerian start-ups (Ranking, 2024).

In Algeria, both Siamois QCM and Assista-Soins are considered the leading companies specializing in healthcare. In this context, Siamois QCM holds the second-best ranking in Algeria. However, startups in the pharmaceutical manufacturing are nearly nonexistent (startups Ranking, 2024). Despite the significant number of start-ups in Algeria, including those in the healthcare sector, the pharmaceutical field remains underdeveloped. This lack of attention is particularly striking given the challenging period Algeria faced during the COVID-19 pandemic, similar to the rest of the world (Labiad & Datoussaid, 2021; Datoussaid et al, 2020). The pandemic highlighted the critical need for robust pharmaceutical capabilities, yet the sector continues to lag behind, receiving far less focus and investment compared to other industries. This gap calls for urgent efforts to prioritize and strengthen pharmaceutical innovation in the country (Alexander et al., 2013, Linghui et al., 2022).

II– Methods and Materials:

To address the research question of the study, we adopted a qualitative approach by selecting a startup in the cosmetics manufacturing located in the Mascara province, specifically the "IMENIUM BIO" company, which is the only active enterprise in the pharmaceutical sector in general. We relied on a combination of oral interviews and information obtained from the official website of the enterprise for data collection.

The study is divided into three main sections:

- **Emergence of the Startup's Activity**
- **Challenges**
- **Blossoming & Positioning of the Company**

Each section branches out into sub-questions, as shown in Table 01 below.

Table (1): Data Collection Guide

Main sections	questions
Emergence of Startup's activity	name of the startup
	What is the main reason for choosing this activity
	What were your reasons for turning to the cosmetics sector rather than the pharmaceutical industry?
Challenges	Do you rely on innovation in your activity?
	Do you use artificial intelligence in your products?
	Do you have a research and development unit or center?
Blossoming & Positioning of the Company	Are you considering forming partnerships with national companies, or have you received offers of this kind?
	Are medicinal herbs and plants primary ingredients in your products?
	What is the target audience that uses your product the most?
	What economic factors make cosmetics production more financially accessible than pharmaceutical production?

The source : by researchers

III- Results and discussion :

III.1. General Insights

After conducting an interview with the manager of a startup specializing in cosmetics production, it became evident that the company deliberately chose to focus on this sector rather than the pharmaceutical business, despite the manager being a qualified pharmacist. The primary reason behind this decision is that the pharmaceutical industry demands significant financial resources, which are often challenging to secure (Fabrizio et al. 2021). As a result, the startup shifted its attention toward cosmetics manufacturing, which is more financially feasible.

Moreover, the cosmetics business presents unique advantages, particularly in terms of innovation (FACCIO, 2020). Cosmetic products are inherently creative and allow for the development of new and exciting formulations (Francisca et., 2015). Additionally, marketing these

products is facilitated by social media platforms, which provide effective channels for reaching a broader audience. The regulatory landscape for cosmetics is also less complex than that of pharmaceuticals, making it easier for start-up to navigate the legal and organizational challenges associated with product development and market entry (Bom et al., 2019).

The startup primarily relies on digital marketing channels to promote its products, utilizing platforms such as WhatsApp, Viber, Telegram, and phone communications. Additionally, it markets its offerings through an official website "IMENIUM BIO" created specifically for this purpose (IMENIUM, 2024), along with an official Facebook page "imeniumShop". This digital approach allows the company to effectively target the national market. It is important to note that the primary target audience is women, as the products are specifically designed for beauty and skincare (imeniumShop page, 2024).

Contrary to what was stated in the theoretical background regarding the tendency of start-up to seek partnerships with large companies due to limited resources (Fabrizio et al. 2021), the case study of this startup reveals a different perspective. While it is true that financial constraints are a common reason for start-up avoiding the pharmaceutical business, this does not necessarily lead to partnerships with major corporations. Instead, the startup has chosen to focus on a sector that has pharmaceutical characteristics—cosmetics—while still operating with limited and accessible financial resources.

This strategic shift allows the startup to engage in activities that are related to pharma practices without the burden of extensive financial investment required in the traditional Drug-related sector. By concentrating on cosmetics, the company can innovate and develop products within a framework that is more manageable in terms of costs, thereby aligning its operations with available resources while still tapping into a market that values quality and effectiveness in beauty and skincare products (Caprin et al., 2021).

Upon examining the startup's official website and Facebook page, it is evident that the company is still in the early stages of developing innovative products. Currently, the product "AquaSel Eau Thermale" is the most promoted offering and is positioned as a natural product, similar to the rest of their product line. However, the company is actively working to introduce new products, specifically "BeeZz" and "Magicae" as part of its ongoing commitment to expanding its range of offerings and enhancing its presence in the cosmetics market.

Although the "IMENIUM BIO" relies on innovation for its products, it has not yet incorporated artificial intelligence into its operations. However, the possibility of utilizing AI in the future remains open, especially considering the ongoing technological advancements related to the pharmaceutical business. As the landscape of technology evolves, the startup may explore the integration of AI to enhance product development and improve operational efficiency, aligning with emerging trends in the sector.

It is crucial to highlight an important aspect regarding the implicit knowledge that has been transformed into explicit knowledge (Datoussaid et al, 2024; Datoussaid, 2019) within the startup. The owner of the startup is a pharmacist, which means he possesses implicit knowledge in the Clinical field. This expertise has been converted into explicit knowledge, contributing significantly to the company's operations and strategy (Datoussaid, 2015). This transformation not only enhances the quality and effectiveness of the products but also represents an intangible asset in the sense of (Bounfour, 1998), that adds value to the startup. The owner's background in pharmacy provides a solid foundation for understanding business standards and consumer needs, ultimately driving innovation and ensuring the company's competitive edge in the market.

III.2 Recommendations for Blossoming Pharmaceutical Entrepreneurship

III.2.1Investment in intangible capital:

In Algeria, unfortunately, there is a lack of understanding of the concept of intangible capital (Labiad & Datoussaid, 2021). As mentioned in the general observations about the company, the director has transformed his implicit knowledge into explicit knowledge and leveraged it to invest in the natural cosmetics business and enter the medicinal market. The scientific background aligned with the startup's activity is considered an intangible capital, as it leverages knowledge in the production of innovative products. This was evident in the pharmacist's decision to focus on cosmetics industry instead of clinical, given his familiarity with this field. Therefore, one of the key determinants for start-up' inclination toward the pharma business is prior knowledge of the Drug-related sector, alongside providing incentives for pharmacists to invest in this area (Diefenbach,

2006; Datoussaid, 2019). In this new case, the intangible investment is very crucial to develop this type of campanies (Datoussaid & Labiad, 2022).

III.2.2 R&D, AI and Innovation Support:

Currently, Research and development is one of the main determinants driving the focus on the medicinal (Zhang et al, 2023; Yuntian Xia, 2024; B Munos, 2010), particularly considering that innovation is a key strength of start-up. The COVID-19 pandemic underscored the pressing need for this sector to innovate and develop new medications rapidly to address global health challenges (Datoussaid et al, 2021). This urgency not only highlighted the critical role of research in producing effective treatments but also revealed the industry's reliance on innovative strategies to adapt to unforeseen circumstances (Datoussad, 2021). Studies have shown that machine learning (ML) is the dominating AI technology currently used in clinical R&D, and start-up can provide more specific AI services to address special issues in the drug-discovery space (Schuhmacher, 2021)

Moreover, the significance of artificial intelligence in this field cannot be overstated. AI technologies facilitate the drug discovery process, enabling companies to analyze vast amounts of data efficiently and identify potential therapeutic candidates more rapidly (Ajeet et al., 2022). By integrating research and development with AI, start-up can enhance their capacity for innovation, streamline their processes, and ultimately contribute to the advancement of this sector, positioning themselves competitively in a rapidly evolving market (Shoukat et al., 2023).

III.2.3 streamlining legislative and financial policies

Administrative and legal facilitation is essential for the development and encouragement of start-up in the bio-pharma (Dhainaut et al., 2020). Simplified processes can reduce barriers, making it easier for new businesses to enter and grow in this complex sector. Financial incentives, such as tax benefits and financial aid, further support these start.ups by easing their financial burden, allowing them to focus more resources on research and development. Together, these measures create a supportive environment that drives innovation and strengthens the competitiveness of this field.

III.2.4 promoting an entrepreneurial culture among pharmacy and medical students:

Promoting an entrepreneurial mindset among university students, particularly those in the fields of pharmacy and medicine is essential for fostering innovation in the pharmaceutical. Implementing entrepreneurship training specifically tailored for pharmacy and medical students can equip them with the necessary skills and knowledge to navigate the complexities of establishing and managing a business in this sector. By offering workshops and training programs focused on pharmaceutical entrepreneurship, institutions can encourage students to explore the intersection of healthcare and business. Such initiatives will not only enhance their understanding of market dynamics but also inspire them to develop innovative solutions to address current challenges in the business. Cultivating this entrepreneurial culture will empower future healthcare professionals to become proactive contributors to the medicinal landscape, ultimately leading to the creation of more start.ups and advancements in health-related products and services (Henry et al., 2024; Mubarak, 2023).

III.2.5 investing in medicinal plants and herbs to enhance the pharmaceutical industry:

Investing in medicinal plants and herbs is essential for enhancing the Drug-related. Algeria has a unique opportunity to leverage its natural resources and benefit from the successful global models of countries like China (Yuntian Xia, 2022), Brazil (Hasenclever, 2017) and India (Nidhi et al., 2021), which have built thriving industries around medicinal plants. By adopting best practices from these nations, Algeria can boost its clinical sector, reduce reliance on imports, and foster innovation in natural medicine (Jou et al, 2024; Claudio , Setzer, 2023), positioning itself competitively in the global market.

III.2.6 Collaboration with national companies through alliances:

Establishing alliances and partnerships between start.ups and national companies can significantly enhance the growth of these emerging businesses. National companies can benefit from the research, development, innovation, and patents generated by start.ups, fostering a

collaborative ecosystem that drives progress (Darren, 2010; Eder et al., 2024). The presence of a prominent company like "SAIDAL" in Algeria can further encourage start.ups to engage in the clinical, providing a valuable platform for knowledge sharing and resource access, ultimately leading to a more dynamic and prosperous sector (Hamadi, & Datoussaid, 2019).

IV- Conclusion:

In conclusion, the growth of start-ups in the medicinal industry is based on several key factors, including scientific capital, investment in research and development, and the use of artificial intelligence technologies to accelerate innovation. Nevertheless, the importance of incentive policies and entrepreneurship training for students in the health sciences is crucial to increasing their involvement in the sector. The case study of the focus on cosmetics illustrates how financial and regulatory barriers can influence investment choices. Furthermore, the valorization of medicinal plants, whether for cosmetic, bio-pharma, or food applications, represents a unique opportunity to promote Algerian agricultural products, not only at the national level but also in the international market. This type of marketing opens new revenue perspectives beyond the hydrocarbon sector. With nearly 4,000 species and subspecies of vascular plants, Algeria possesses a rich phylogenetic reservoir that can energize this expanding market. By supporting these initiatives, the emergence of pharmaceutical entrepreneurship could transform into a flourishing sector, leading to a stimulating impact on the growth of the pharmaceutical and cosmetic industries while contributing to economic diversification.

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