

TRENDS IN THE DEVELOPMENT OF THE PHARMACEUTICAL INDUSTRY

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Abstract

This article examines the key trends in the development of the pharmaceutical industry in the Republic of Uzbekistan, considering the influence of globalization, competitive dynamics, state regulation, and technological advancements. The study highlights the rapid transformation of the global pharmaceutical market and the increasing role of innovation in ensuring the industry's sustainable growth. Special attention is given to the localization processes within the pharmaceutical sector, emphasizing the government's role in promoting domestic production. The paper analyzes the factors affecting pharmaceutical enterprises, including research and development (R&D) expenditures, market risks, and the challenges of high-tech drug production.

Keywords: Pharmaceutical industry, globalization, innovation, state regulation, localization, research and development (R&D), high-tech drug production, competitive dynamics, economic growth.

Introduction

Globalization, changes in the structure of competition and increasing competitiveness, state regulation of the industry (drug registration, intellectual property protection), the development of new directions and technologies (biotechnology, pharmacogenomics), the aging global population, and the emergence of new diseases are the key trends shaping the pharmaceutical industry.

In recent years, the global pharmaceutical market has undergone rapid, unprecedented, large-scale, and complex changes. Today, the pharmaceutical industry is one of the most inventive, innovative, and profitable "high-tech" sectors of the economy. Due to globalization, the industry is experiencing periods of significant and profound transformation. The pharmaceutical sector is increasingly adapting to market trends and demands, integrating the vast potential of human innovation. However, it remains a highly complex, multifaceted, and high-risk industry, where success in bringing a new drug to market and achieving profitability is never guaranteed.

To develop and maintain their market positions, pharmaceutical companies must invest substantial resources in marketing and sales. Fundamental research and development (R&D), along with marketing and commercial activities, are the two most crucial aspects of the global pharmaceutical industry, attracting massive investments from pharmaceutical enterprises.



Literature Review

Foreign researchers M. Zizka et al. (2018) have long proven the impact of clusters on the innovative activities of industrial enterprises. In their study, they examined whether clusters have a significant influence on the innovation performance of member enterprises. The research included a selection of innovative enterprises within a cluster and those operating outside of a cluster in the same region. The primary objective of the study was to test the hypothesis that enterprises within a cluster organization demonstrate higher innovation performance compared to those outside the cluster.

An analysis of the pharmaceutical industries of China and India shows that clusters have played a crucial role in the development of the pharmaceutical sector. To create favorable conditions for both domestic and foreign enterprises in Uzbekistan, the first innovative scientific and industrial pharmaceutical cluster, "Tashkent Pharma Park,"² was established in the Zangiata district of the Tashkent region by a presidential decree. The main objective of establishing a pharmaceutical cluster in the country is to develop the scientific and educational potential of Uzbekistan's pharmaceutical sector by creating an integrated system for training and preparing highly specialized professionals, facilitating their employment, and enhancing their qualifications within a unified innovative pharmaceutical cluster.

The research methodology includes both quantitative and qualitative assessment of government regulation in the pharmaceutical industry, as well as the identification and analysis of factors influencing research and development activities in the pharmaceutical sector of the republic.

Main Part

The success of pharmaceutical companies depends on various factors. It is also important to note the significant role of state regulation in the industry. The government plays a key role in initiating localization efforts within the pharmaceutical sector.

An analysis of both foreign and domestic pharmaceutical industries in recent years highlights that the sustainable development of the industry is largely driven by innovation. Today, the pharmaceutical industry in the Republic of Uzbekistan is experiencing substantial growth, with increased production volumes due to modernization and the re-equipment of existing production facilities.

A comprehensive application of innovative tools will enable the creation of high-tech pharmaceutical products that meet international standards. The implementation of these tools should be carried out both at the level of individual enterprises and within specially designated zones, such as clusters and free economic zones.

An analysis of the current state of the pharmaceutical industry in the Republic of Uzbekistan shows that improving localization processes in the sector plays a crucial role in the accelerated

¹ Miroslav Žižka, Vladimíra Hovorková Valentová, Natalie Pelloneová, Eva Štichhauerová. The effect of clusters on the innovation performance of enterprises: traditional vs new industries. *Entrepreneurship and Sustainability Issues*, 2018, 5 (4), pp.780 - 794. 10.9770/jesi.2018.5.4(6)

² Постановлением Президента от 28.01.2020 г. №ПП-4574 «О создании инновационного научно-производственного фармацевтического кластера «Tashkent Pharma Park»



and sustainable development of the national economy. Localization contributes to reducing the country's dependence on external factors and facilitates the introduction of new, efficient technologies into production processes.

The use of local raw materials and production factors to increase the volume of competitive products is the foundation of localization processes aimed at industrial development in Uzbekistan. The country has established all the necessary conditions for the formation and implementation of localization processes for the production of high value-added goods, including a well-developed regulatory and legal framework.

At the current stage of Uzbekistan's economic development, territorial factors play a key role in structural transformations, ensuring the dynamics and pace of modernization and growth. Localization in the pharmaceutical industry is primarily based on the country's vast resource potential. The localization process in the pharmaceutical sector is aimed at providing the population with high-quality domestically produced medicines, increasing employment and overall well-being, developing regional infrastructure by relocating production facilities to different regions, and enhancing export potential.

The localization of finished product manufacturing, components, and materials through industrial collaboration, as well as the establishment of a production chain from raw material processing to the creation of high-tech pharmaceutical products, is the ultimate and primary goal of localization. The formation of a value chain in the pharmaceutical industry can be achieved through the development of pharmaceutical clusters and special economic zones.

Today, clusters are considered one of the key tools for regional economic development and are used to establish regional innovation systems. Since the 1990s, the concept of clusters has evolved. Initially, clusters were understood as the geographic concentration of companies, universities, research institutes, professional organizations, and regional development agencies within a specific geographic area, benefiting participants through agglomeration economies. However, modern cluster organizations are now purposefully created based on cluster development strategies.

The formation of cluster organizations is often initiated by government authorities and supported with public funding. In this context, efficiency refers to the ability to achieve the goals of subsidized support, namely enhancing the innovative performance of cluster enterprises. Efficiency, in this case, is defined as achieving these objectives with minimal costs. In a highly competitive environment, enterprises tend to localize within specific geographic areas³. The concept of cluster formation is closely linked to various innovation systems. Porter's cluster theory has sparked debates across multiple academic disciplines, ranging from spatial planning and economic geography to public administration and economic development. Over the past two decades, there has been a significant surge of interest in clusters among experts and policymakers, with cluster support becoming a dominant strategy for regional development⁴. Clusters have now evolved into a modern form of industrial collaboration, and

³ Akhmetshin, E. M.; Kolpak, E. P.; Sulimova, E. A.; Kireev, V. S.; Samarina, E. A.; Solodilova, N. Z. 2017. Clustering as a criterion for the success of modern industrial enterprises, *International Journal of Applied Business and Economic Research* 15(23): 221-231.

⁴ Fang, L. 2015. Do Clusters Encourage Innovation? A Meta-analysis, *Journal of Planning Literature* 30(3): 239–260.



their innovative nature is regarded as one of the key sources of regional and national competitive advantages⁵.

A pharmaceutical cluster is a geographically localized group of interconnected innovative drug development firms, manufacturing companies, equipment and component suppliers, specialized service providers, and infrastructure facilities such as research institutes, universities, technology parks, business incubators, and other organizations. These entities complement one another and enhance the competitive advantages of both individual companies and the cluster as a whole.

Conclusions and Recommendations

The establishment of a pharmaceutical cluster will elevate Uzbekistan's pharmaceutical industry to a new level of development. It will serve as the foundation for advancing research and development (R&D) capabilities, integrating international expertise into the biopharmaceutical sector, and training local personnel in accordance with globally recognized standards and requirements. These steps are crucial for the successful development of new pharmaceutical products and medical devices.

A key priority is to attract Big Pharma companies to the cluster and create a favorable environment for their successful operation. Achieving this goal requires an efficient cluster management system, an improved regulatory framework, streamlined drug registration processes, enhanced intellectual property protection, preclinical medical trials, and the establishment of substance production facilities.

The Concept for the Development of Uzbekistan's Pharmaceutical Industry envisions an innovation-driven transformation of the sector, aligning with the broader vision of a New Uzbekistan. However, building a robust and self-sufficient pharmaceutical industry is a long-term, resource-intensive, and costly endeavor. To support this growth, it is essential to establish conditions for the localization of pharmaceutical and medical product manufacturing using cutting-edge technologies and in compliance with Good Manufacturing Practice (GMP) international standards. This strategic approach will ensure the sustainable development of Uzbekistan's pharmaceutical sector and its competitiveness in the global market.

Globalization and the expansion of the global market impose new challenges on enterprises, requiring increased efficiency in industrial production and active growth in the export of high value-added products.

The establishment of free economic zones (FEZs) in Uzbekistan significantly contributes to the localization process and the overall improvement of regional infrastructure. These zones facilitate the modernization and technological advancement of the pharmaceutical sector, the development of innovative and high-tech pharmaceutical products, the expansion of pharmaceutical exports, and the promotion of cutting-edge scientific and technical innovations. Additionally, they help reduce the country's dependence on foreign markets.

⁵ D'Alise, C.; Giustiniano, L.; Peruffo, E. 2014. Innovating Through Clusters, International Journal of Engineering Business Management 6(28): 1–14.



Uzbekistan has established several pharmaceutical FEZs, including: Sirdaryo-Pharm, Zomin-Pharm, Nukus-Pharm, Boysun-Pharm, Andijan-Pharm, Parkent-Pharm, Kosonsoy-Pharm, Bustonlik-Pharm.

The creation of these zones aims to attract additional investments, establish new production facilities, promote technology transfer, foster innovation, and implement international standards in manufacturing.

The adoption of Good Manufacturing Practice (GMP) standards plays a crucial role in ensuring the production of high-quality pharmaceutical products. This, in turn, accelerates the development of Uzbekistan's pharmaceutical industry and strengthens its position in the global pharmaceutical market in terms of both product quality and diversity.

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