IMPROVING THE MANAGEMENT MECHANISMS OF SCIENCE AND TECHNOLOGY PARKS TO ENHANCE THE PERFORMANCE OF INDUSTRY

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Science and technology parks serve as critical ecosystems that facilitate the transfer of technology, foster collaboration between academia and industry, and stimulate industrial growth. New Uzbekistan has made significant steps for the industrial development over the past years, which bring to the status of one of the fastest-growing economies in Central Asia. The industrial sector contributed approximately 33% to the national GDP in 2023 [1], with a gradual increase in industries like textiles, automotive, and chemicals. Particularly, the textile industry accounted for 2 billion USD in exports, driven by government initiatives to decrease raw cotton exports and promote value added finished goods manufacturing. In the automobile industry, under the wise policy of the President Sh. Mirziyoyev the BYD Uzbekistan plant in Jizzakh was established which is BYD's first Factory outside of China. In its first phase, the investment of $160 million and created 1,200 jobs. In this factory process starts from welding and painting to final assembly. In short-term period production capacity is going to be increased 500 thousand cars per year [2]. Furthermore, after the acceptance of "Localization Program" for domestic production of automotive components, dependency of imports reduced by 25% over the last five years [3].

Uzbekistan is on the way of being a member of the World Trade Organization (WTO) which marks a pivotal moment for its industrial policy. Joining the WTO will expose the country's industries to global competition, requiring higher standards in production, innovation, and sustainability. Without increased focus on R&D and innovation, industries risk falling behind in the competitive international market. This highlights the urgency of creating policies and mechanisms to foster innovation and improve industrial resilience.

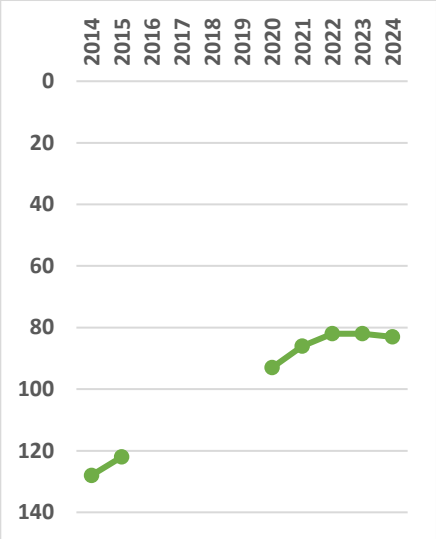
In this context, science and technology parks (STPs) serve as crucial enablers of industrial innovation. These parks provide a platform for collaboration between academia, industry, and government, facilitating the commercialization of research and the adoption of cutting-edge technologies. However, the effectiveness of STPs depends heavily on robust management mechanisms. Establishing clear governance structures, streamlining funding allocation, and encouraging public-private partnerships are essential to maximize their impact. Thus, enhancing the management mechanisms of STPs is critical to ensuring that they fulfill their potential as drivers of industrial growth and innovation.

There has been made enormous steps for the improvement of innovative ecosystem during the recent years in new Uzbekistan. Particularly two laws "On science and scientific activity" and "On innovative activity" [4] were approved which states regulation in innovative ecosystem. The first time in the history of the country terms of innovative infrastructures, venture funds, startups etc. were introduced which resulted in establishing facilities for talented young innovators and scientists. As a result of these efforts, Uzbekistan has seen significant advancements in its innovative capacity, positioning itself as a growing hub for innovation in the region. The country's progress in creating a more inclusive and supportive environment for research and innovation is

evident in the increased activity of startups, the establishment of venture capital funds, and the overall dynamism of its scientific community.

As a result, Uzbekistan has made impressive strides in fostering innovation, and the Global Innovation Index (GII) which is announced annually can be a great example of this progress (graph 1). In 2014, Uzbekistan ranked 128th among 133 countries in the Global Innovation Index, reflecting the challenges it faced in fostering innovation at the time. From 2016 to 2019, the country temporarily dropped out of the rankings due to insufficient data and lack of information sharing. However, significant reforms in the innovation sphere have driven notable progress in recent years. As a result, Uzbekistan has climbed to the 83rd position, marking a substantial improvement. This progress positions the country as a leader in innovation within its region, proving the effectiveness of its policy changes and strategic investments in the innovation ecosystem [5].

To ensure further development, Uzbekistan must focus on expanding and strengthening innovative infrastructures such as science and technology parks, business incubators, and startup accelerators. According to the Strategy of Innovative Development of Uzbekistan for 2022-2026, approved by a Presidential Resolution, the country currently has 55 innovative infrastructures, with plans to increase this number to 75 by 2026. [6] While Uzbekistan has gained valuable experience in constructing such facilities, challenges remain in their effective management. Many of these infrastructures are underperforming due to weak management mechanisms, leading to poor integration between science, education, and production. Addressing these gaps will be crucial for fully realizing the potential of these facilities and ensuring they contribute meaningfully to the country's innovation-driven growth.



Graph 1. Uzbekistan ranking in GII for the last 10 years.
Source: WIPO report

Based on international experience, various management models for innovative infrastructures such as technoparks, each tailored to the specific needs and conditions of their regions. The most common models include University Science Parks, Independent Organizations, Corporate Parks, Network Parks, Governmental Parks, and Public-Private Partnership (PPP) Parks. [7].

In Uzbekistan according to the Law on Innovative Activity, most science and technology parks are currently government or university established. While this has provided a foundation, the current management mechanisms are insufficient to achieve optimal performance, leading to weak integration between science, education, and production. Subsequently to attract more capital from the industry or private enterprises to innovative activity and implement more innovation into the manufacturing it is necessary to involve businesspeople to the management of innovative infrastructure. Thus PPP management model is offering to implement for governing technoparks. This model aligns with the country's Strategy of Innovative Development for 2022-2026, which emphasizes collaboration and sustainability in innovation. The PPP model leverages the strengths of both public and private sectors, enabling diverse funding opportunities, reducing the burden on government financing, and

fostering stronger industry ties. Moreover, it offers flexibility to adapt to the unique needs of Uzbekistan's innovation ecosystem while ensuring accountability and efficiency.

Public-Private Partnership (PPP) Parks combine government financing with private-sector efficiency, creating a balance between public control and private innovation. This model benefits from diverse funding sources and strong industry partnerships. However, it requires careful alignment of public and private interests to avoid conflicts. Technology Park Malaysia exemplifies this model, leveraging collaboration to drive innovation effectively [8].

By transitioning to the PPP model, Uzbekistan can address its current management challenges and ensure that its science and technology parks function as dynamic hubs of innovation. This approach will not only enhance the integration of science, education, and production but also position Uzbekistan as a leader in innovation within the region, driving sustainable economic growth and technological advancement.

The diagram 1 represents the proposed Public-Private Partnership (PPP) management model for technoparks in Uzbekistan, aimed at fostering innovation, commercialization, and economic growth through effective collaboration among stakeholders. At the top level, the Government acts as the primary enabler, providing the necessary policy frameworks, regulations, and funding to establish and support the innovation ecosystem. Alongside, Universities contribute technoparks with academic expertise and research capabilities, whereas research Institutions provide applied and theoretical research to drive technological advancements. On the other hand private enterprises bring market-oriented insights, investments, and operational expertise, bridging the gap between research and commercialization.

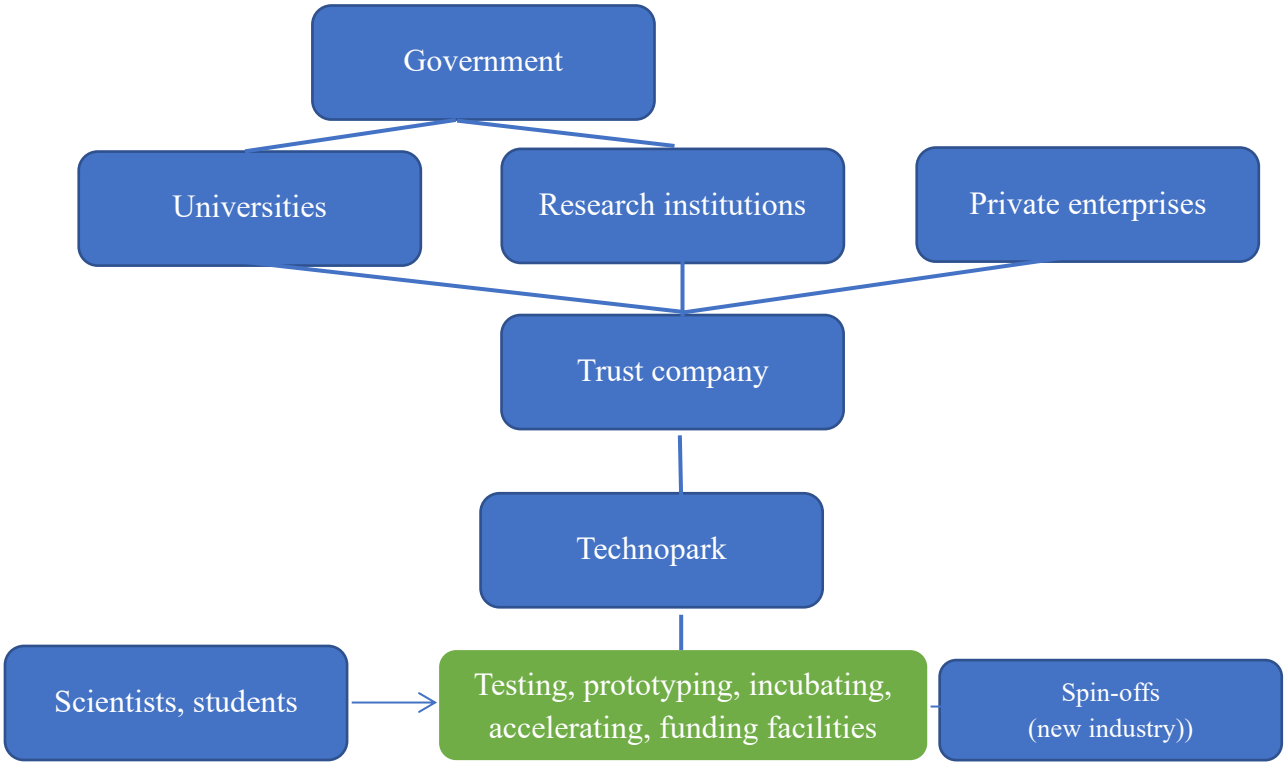


Diagram 1. Proposed Public-Private Partnership (PPP) management model for technoparks in Uzbekistan

Source: Made by the author

The core of this model is the trust company in which the shares are split by half between government and private enterprise, which acts as the coordinating body, ensuring alignment and synergy between these stakeholders. It oversees governance, resource distribution, and project implementation while facilitating cooperation among the government, universities, research institutions, and private enterprises. By centralizing management, the trust company ensures efficient resource allocation, eliminates redundancies, and creates a unified direction for the technopark's activities.

Subsequently, technopark provides essential services such as testing, prototyping, incubating, accelerating, and funding facilities, which are important for developing innovative ideas and guiding them toward commercialization. This stage acts as a catalyst for transferring research and development into production or establishing new industries, offering a platform for scientists, students, and entrepreneurs to refine their ideas and bring them to market readiness. PPP management model enhances performance of technoparks which brings positioning them as key drivers of Uzbekistan's innovation ecosystem, ensuring sustainable economic growth and technological advancement in line with the country's strategic goals.

The findings from this research emphasize the critical role of science and technology parks (STPs) in fostering innovation and industrial growth in Uzbekistan. Despite the significant strides made in establishing innovative infrastructures, challenges in effective management mechanisms persist. These challenges have led to inefficiencies and a lack of integration among science, education, and industry, undermining the potential impact of these infrastructures. The current reliance on government-funded and university-managed technoparks has provided a foundational framework, but it is insufficient to meet the demands of a rapidly evolving global innovation landscape.

To address these challenges, this study proposes transitioning to a Public-Private Partnership (PPP) management model for technoparks. The PPP model leverages the strengths of both public and private sectors, ensuring a balance between government oversight and private-sector efficiency. This approach facilitates diverse funding opportunities, encourages strong industry ties, and allows for more agile and responsive management structures. The proposed model incorporates a trust company as a central coordinating body to streamline governance, align stakeholder interests, and ensure efficient resource allocation. This centralized management structure is vital for enhancing the performance and sustainability of technoparks.

Moreover, the PPP model aligns seamlessly with Uzbekistan's Strategy of Innovative Development for 2022-2026, which emphasizes the importance of collaboration, sustainability, and innovation-driven growth. By adopting this model, Uzbekistan can transform its technoparks into dynamic hubs of innovation, capable of fostering successful startups, supporting research commercialization, and driving the creation of new industries. The focus on testing, prototyping, incubation, and acceleration within the technoparks will provide critical support to scientists, students, and entrepreneurs, ensuring a steady flow of innovative products and services into the market.

In conclusion, transitioning to a PPP-based management model is not only a strategic imperative but also an essential step toward achieving Uzbekistan's long-term innovation and economic development goals. By addressing current management gaps and fostering greater collaboration among stakeholders, this approach has the potential to position Uzbekistan as a regional leader in innovation and industrial competitiveness. The successful implementation of

this model will enhance the integration of science, education, and production, creating a robust and sustainable innovation ecosystem that drives economic growth and technological advancement.

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