



Development of Aviation Hubs as a Tool for Increasing Uzbekistan's International Competitiveness

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ABSTRACT

The article reviews the issues of the development of aviation hubs in Uzbekistan, their importance in increasing the international competitiveness of the national economy, and studies the features of the Dubai model of aviation hub development as a case model. Cargo and passenger traffic of domestic airports have been analyzed, existing problems in the aviation industry of the country have been studied, prospects have been considered, and proposals for the development of aviation hubs in the country and their use as a competitive advantage were presented.

Keywords: International airport ▪ Aviation hub ▪ Airline ▪ Transportation and logistics terminal ▪ Transit potential

1. INTRODUCTION

As a result of globalization and economic integration, world countries, as participants of international economic relations, affect the international division of labor and diversification of production. This generates competition between countries for a certain niche in the international market, forcing them to compete with each other to attract human capital, tourists, investments, new technologies and innovations, and, most importantly, increase capital inflow to the country through the promotion of goods and services. This requires not only improving the quality of goods and services offered, but also focusing production on the country's competitive advantages, which are not only inherent in historical, natural, climatic, and geographical factors but also created consciously. Relying on the availability of certain natural resources, natural-climatic factors, or military force is becoming far from relevant due to the paradoxical development of "resource-poor" countries; variability of natural factors; increasing environmental issues such as global warming and environmental disasters; and the use of information and biochemical weapons. These developments have shaken the classical standards of countries'

advantages, and therefore the relevance of "soft" tools has increased. As a result, countries are trying to improve and consolidate their global positions with their economic power and international competitiveness. Entering international economic relations, countries choose the strategy of their foreign economic policy, including the development of foreign trade, and its success predominantly depends on the competitive advantages of countries.

According to Porter's theory, no country can be competitive in all spheres due to limited available resources, and regardless of the degree of its development, there are uncompetitive sectors of the state economy. This fact creates prerequisites for the development of the most effective and competitive segments of the economy and the relocation of less "attractive" segments abroad or complete abandonment of such segments, which stimulates the economic prosperity of the country. Porter also states that competitive advantage does not have to be inherited; it can be consciously created [1].

The author reviews the problems and prospects for the development of an aviation hub in Uzbekistan, as the country has all the prerequisites for its use as a competitive advantage.

2. METHODOLOGY

The theoretical and methodological basis of the scientific article is derived from studies of domestic and foreign researchers in the fields of aviation, logistics, and marketing, as well as materials from scientific and practical conferences. The following methods of analysis are used in the work: induction, deduction, comparative analysis, logical analysis, and content analysis.

A hub or hub airport (English: airline hub) is an airport used by airlines as a transfer point for passengers and having a high percentage of connecting flights. It is an element of a hub-and-spoke network in which passengers traveling between airports not connected by direct flights can reach their destination by connecting from one flight to another [2].

Up to several hubs may be used by airlines in both passenger and cargo transportation. Additionally, similar hubs can be formed in the route network of airlines operating several flights to different destinations without being connecting points. Such large hubs are also referred to as “secondary hubs.” In many cases, an airline’s hub is the largest airport in the country (for example, Dubai for Emirates Airline).

3. LITERATURE REVIEW

The framework of the modern air transportation network consists of the largest hub airports—also known as air hubs—which are not only places of destination or departure but also act as transfer stations, redistributing passenger flows. Hubs are part of the new air-passenger-transportation model, “hub and spoke.” It supplements the initial destination model. Under the hub-and-spoke model, passengers from local airports are directed to a hub, and then they are transferred either to connecting hubs for international destinations or to domestic routes. This model has helped to significantly reduce costs and optimize the air transport market by improving flight occupancy and reducing the cost of flights.

According to researchers, modern airports are drivers of regional economic growth [3]. The transition from a linear structure to the hub-and-spoke model was initiated by the deregulation of air transportation in the United States in 1978, which allowed air carriers to significantly reduce costs [4].

Industry experts have formed several approaches to the definition of a hub airport, emphasizing its key role in the hub-and-spoke model. In general, approaches to the definition of a hub as a hub airport reflect its peculiarity in relation to airports occupying a secondary position in the system through its key functions related to the organization of connections and redistribution of air-transport flows between different settlements.

The main purpose of creating hubs is the concentration of passenger flows in the hub, which makes it possible to increase the profitability of transportation and the number of destinations and frequency of flights to final destinations where it is not profitable for a mainline carrier to fly [5].

Button et al. [6] define that carriers typically utilize one or more major airports in a hub-and-spoke system. Flights are sequenced so that passengers continuing the flight are grouped onto flights departing to distant destinations. Revising the initial notion, the authors define a hub-and-spoke system as

a system of airlines whose purpose is to consolidate flights from different points of origin going to different destinations at major hubs.

Supporting this approach, Yegorov [7] states that hubs are distribution centers that allow passenger flows to gather at a central point and be redistributed there before proceeding to their destinations.

According to O’Kelly and Bryan [8], hubs are specific nodes in a system, located in such a way as to facilitate connections between interacting points. In their subsequent research, the authors further emphasize that hubs serve as transfer points and allow direct connecting networks between all nodes to be replaced with fewer indirect connections [9].

Pardo [10] highlights that a hub airport is a connecting airport with a major transfer and transshipment transportation hub, a necessary set of services, and a geographical position that provides for the concentration of passenger flows and their distribution to different destinations.

Kotin [11] further states that in the hub-and-spoke model, a hub airport is a transit and transfer airport where the hub collects passengers on local, interregional, and intercontinental routes and transfers these passengers by regional and local routes (spokes) to final destination points where it is not profitable for a large carrier to fly directly.

Zvereva [12] highlights that a hub provides airlines with such advantages as increased frequency of flights, reduction of market risks due to the retention of passengers in their route network, and expansion of the flight network with reduced cost.

Frank and Rubanov [13] believe that a necessary condition for the formation of a hub airport is the existence of a strong domestic carrier with a stable financial position. At the same time, it is the airport that can start implementing the hub strategy by convincing airlines to base several aircraft at it.

Analysis of different researchers shows that, in general, the term “hub” refers to a point with a sufficiently large transit and transfer airport and a favorable economic and geographical location at the intersection of transport routes. Thus, hubs act as distribution centers used for passenger flows to move to a central point, regroup there, and then continue in a variety of directions. The construction of such distribution schemes takes into account the geographical orientation and capacity of flows.

4. CASE STUDY

For many international airports, becoming a hub has long become not just a goal but a reality that provides the country with sustainable economic growth (GDP growth), connects certain regions of the country with global markets, develops related industries, and increases employment of the local population in industries serving such hubs. Most importantly, it allows a country or city to distinguish itself among hundreds of competitors. By increasing the volume of passenger traffic and providing high-quality service, airports receive substantial income and improve their competitive position in the industry, attracting more airlines and benefiting from increased flight frequency, customer loyalty, and other advantages. Thus, the creation of a hub is beneficial for all stakeholders, urging them to take advantage of the opportuni-

ties arising from this establishment.

Dubai's experience as an aviation hub is an interesting case study. The history of Dubai's busiest and most profitable aviation hub began in 1959 with a small international airport that accepted only a limited number of small aircraft on an asphalt runway 1,800 meters long. Due to the efforts and persistence of Sheikh Mohammed, the airport gradually expanded, initially becoming a major East–West refueling point and subsequently participating in an open-skies policy and displacing London Heathrow in terms of international passenger traffic [14]. Today, more than 100 airlines operate at the international airport.

At the same time, it should be noted that during its initial establishment, the airport's operating model was in direct contrast to those of other regional airports: Dubai Airport did not enjoy privileges backed by national legislation that would have protected it from international competition. The Dubai model of airline development is associated with Emirates Airline, which started with two airliners leased from Pakistan in 1980 and today has more than 200 Airbus and Boeing aircraft, operating scheduled flights to Africa, Asia, Europe, North and South America, Australia, New Zealand, and the Middle East [14]. In 2016, the company flew to 155 destinations in 83 countries, carrying 55 million passengers on more than 860,000 passenger flights. Only the presence of two determining factors—the airport itself and the Emirates Airline company philosophy—allowed Dubai Airport to become the busiest international airport in the world, with passenger traffic of more than 66 million in 2022 [15].

Although the flagship carrier Gulf Air operated successfully in the 1980s, serving flights from the UAE, a new airline launched in the region with the support of Sheikh Mohammed. Emirates, established with purely commercial goals, marked the beginning of the end of Gulf Air's monopoly. Despite certain risks and even in view of the policy of protectionism in the airspace, the government decided to follow the path of liberalization. Today, this philosophy fully supports M. Porter's theory of competitiveness, which is based on the laws of the free market. This theory highlights the pivotal role of free trade and healthy competition between domestic and foreign companies, and argues that any manifestation of government intervention, whether subsidies or protectionist policies, has an extremely negative impact on the competitiveness of domestic producers [1].

Less than half a century later, Dubai's airport and national airline epitomize one of the country's main competitive advantages, ensuring its position as a global aviation center that firmly maintains its leadership position.

As of today, a new airport in Jebel Ali, named Dubai World Central–Al Maktoum International Airport, is under construction and is expected to be the second-largest airport in the world in terms of size. The airport opened in 2010, and full construction is expected to be completed by 2027. It will be able to handle up to 160 million passengers and 12–14 million tons of cargo per year.

Dubai's Roads and Transport Authority (RTA) presented prototype aerial-taxi vertiports at the World Government Summit in February 2023. The service is planned to become operational by 2026. The initial network will connect Downtown

Dubai, Dubai Marina, Dubai International Airport, and Palm Jumeirah. The electrically powered aircraft are designed for vertical takeoff and landing, zero harmful operating emissions, and a capacity of four passengers plus a pilot [16].

Luis Felipe de Oliveira, ACI World CEO, noted in ACI's press release dated April 5, 2023, that the new top 10 busiest airports for passenger traffic reflected the resilience of the airport and aviation industry and passengers' eagerness to travel by air. While U.S. airport hubs recovered more quickly because of their strong domestic market, global hubs including Dubai, Istanbul, and London Heathrow were also returning to the upper ranks [15].

At the same time, three Turkish airports were included in the top 50 largest airports in the world in 2022, and Istanbul International Airport entered the top 10 in terms of congestion.

It should be noted that because of growing trade relations between the countries, as well as the expanding investment activity of Turkish investors in Uzbekistan's national economy, Uzbekistan can successfully adopt the experience of Dubai and Turkey in the field of aviation and shape the country's leading international airports into a global aviation hub. According to Shoira Nurdinova, senior research fellow at the Center for Economic Research and Reforms, Turkey, as a member of the EU Customs Union, can help organize alternative routes for exporting goods from Uzbekistan to the European Union [17].

These countries serve as good examples for the implementation of the strategy for Uzbekistan's development as an aviation hub, for which Uzbekistan has the necessary prerequisites. Despite the country's efforts to improve service standards at airports and their infrastructure, construct new passenger terminals, repair runways, and take other measures, these steps are still insufficient to increase the attractiveness of the domestic aviation sector for foreign air carriers.

To improve the international competitiveness of the aviation sector and rationally use the potential available in the country, it is necessary to analyze the advantages and disadvantages as well as the potential and opportunities of this sector.

5. DISCUSSION

This section examines the potential for establishing an aviation hub in Uzbekistan. It analyzes current challenges and prospects in the country's aviation industry and reviews how an aviation hub could enhance national competitiveness.

The Government of Uzbekistan has recently been taking steps in this direction. Uzbekistan Airways, which operated according to monopolistic principles in the absence of competition, was reorganized in October 2019. As a result, two companies—Uzbekistan Airways and Uzbekistan Airports—were established to separate air-transportation and airport-service functions. Furthermore, to increase passenger traffic, provide high-quality services both in the country and across the region, expand the competitive environment in aviation, and meet the needs of passengers in the country and the region, two more companies, Humo Air and Uzbekistan Helicopters, were created [18]. To deepen the impact of the reforms, expand the geography of flights, and further liberalize the aviation market, Uzbekistan introduced the open-skies regime in 2019, applying the fifth freedom of the air at inter-

Table 1. Top 10 busiest airports by passenger traffic

2022	2021	2019	Airport	Passengers 2022	Change vs. 2021	Change vs. 2019
1	1	1	Atlanta, GA, US (ATL)	93,699,630	23.8%	−15.2%
2	2	10	Dallas/Fort Worth, TX, US (DFW)	73,362,946	17.5%	−2.3%
3	3	16	Denver, CO, US (DEN)	69,286,461	17.8%	0.4%
4	4	6	Chicago, IL, US (ORD)	68,340,619	26.5%	−19.3%
5	27	4	Dubai, AE (DXB)	66,069,981	127.0%	−23.5%
6	5	3	Los Angeles, CA, US (LAX)	65,924,298	37.3%	−25.1%
7	14	28	Istanbul, TR (IST)	64,289,107	73.8%	23.2%
8	54	7	London, GB (LHR)	61,614,508	217.7%	−23.8%
9	13	17	New Delhi, IN (DEL)	59,490,074	60.2%	−13.1%
10	31	9	Paris, FR (CDG)	57,474,033	119.4%	−24.5%

*Total passengers enplaned and deplaned; passengers in transit counted once.

Source: ACI World (2023) [15].

Table 2. Top 10 busiest airports by international passenger traffic

2022	2021	2019	Airport	Passengers 2022	Change vs. 2021	Change vs. 2019
1	1	1	Dubai, AE (DXB)	66,069,981	127.0%	−23.5%
2	7	2	London, GB (LHR)	58,243,060	230.5%	−23.4%
3	3	3	Amsterdam, NL (AMS)	52,467,346	105.8%	−26.8%
4	5	6	Paris, FR (CDG)	51,763,569	128.9%	−25.9%
5	2	14	Istanbul, TR (IST)	48,521,725	83.3%	22.6%
6	4	8	Frankfurt, DE (FRA)	44,771,711	97.3%	−29.0%
7	9	11	Madrid, ES (MAD)	36,231,191	136.2%	−19.3%
8	6	15	Doha, QA (DOH)	35,726,721	101.8%	−7.9%
9	95	7	Singapore, SG (SIN)	31,902,000	952.9%	−52.8%
10	55	13	London, GB (LGW)	30,145,083	501.5%	−30.1%

*International passengers enplaned and deplaned.

Source: ACI World (2023) [15].

national airports such as Karshi, Nukus, Termez, and Bukhara. However, the expected sharp increase in the number of foreign flights and rapid growth in passenger traffic have not yet been observed.

Currently, Uzbekistan has 11 international airports that are part of Uzbekistan Airports JSC, some of which can be successfully used as hubs. Uzbekistan Airports JSC also includes subsidiary handling companies such as Uzbekistan Airports Handling LLC, also known as UzPort, and Uzbekistan Airports Cargo LLC, a subsidiary established on the basis of the airport's mail and cargo complex, which has been operating since November 1, 2022. According to a company statement, the total passenger traffic of all airports in Uzbekistan amounted to 7.9 million passengers in 2022 and reached 10 million in 2023 [19]. Despite these positive trends and noticeable changes in the indicators, they still lag far behind global dynamics.

According to the report on the results of the road map by the Ministry of Transport of Uzbekistan in 2022, 52 international agreements of an interstate and intergovernmental nature in the field of air communication have been signed between the Republic of Uzbekistan and foreign countries [20].

5.1 Airports and Cities

Tashkent. The country's main airport, Islam Karimov Tashkent International Airport, currently serves aircraft from more than 30 airlines as both a refueling point and a flight-connecting point. According to the prospective development plan, Tashkent Airport should be transformed into the largest international hub in the region, through which both passenger and cargo intercontinental air transportation will pass [21].

Samarkand. After general reconstruction, Samarkand International Airport was certified under ICAO Category 1. Today it accepts all types of aircraft and has become one of the

important points on international transit routes; the capacity of its air terminal is 400 passengers per hour [21].

Bukhara. After completion of the modernization program in 1999, Bukhara Airport acquired international status, and its modern terminal has a capacity of up to 150 passengers per hour. As noted by Uzbekistan Airways, more than 90,000 passengers, including 15,000 foreign tourists, use this airport's services annually [21].

Navoi. The International Intermodal Logistics Center was established on the basis of Navoi Airport, which is considered one of the largest and most technologically advanced air-cargo complexes in the region. Today it connects Uzbekistan with the main logistics centers of Europe and Asia: Frankfurt, Milan, Vienna, Oslo, Basel, Zaragoza, Dubai, Delhi, Incheon, Tianjin, Hanoi, and Shanghai [21].

Based on the above, it is time for the country to utilize its transit potential to its full extent. However, this requires a comprehensive solution to the challenges and existing problems in this area.

5.2 Advantages

- **Unique natural and climatic conditions.** Uzbekistan has around 300–320 sunny days per year, which is one of the most important factors in navigation and a competitive advantage over the nearest competing countries. In addition, it is necessary to emphasize the country's convenient geographical position in the center of the region.
- **Tourism.** The country's rich tourism potential can be a very attractive factor for transit flights, allowing travelers to spend waiting time beneficially, especially when the time between connecting flights exceeds 24 hours. It is possible to develop smart packages that include a short sightseeing tour of the country's historical cities (Bukhara, Samarkand, or Khiva), or provide an opportunity to enjoy food tourism.

Table 3. Key indicators of air-transport development in CIS countries in 2022

Indicator	Armenia	Kazakhstan	Kyrgyzstan	Uzbekistan	Russian Federation
Cargo turnover (million t-km)	7.6	54.4	17.6	53.6	2,826.8
Passenger turnover (million passenger-km)	1,474.5	20,109.3	2,071.9	10,900	227,951.6
Cargo transportation (thousand tons)	23.2	24.5	0.3	64.3	606.3
Passenger transportation (million people)	3.7	11.0	1.2	7.9	95.2

Source: Compiled by the author from Eurasian Economic Commission data and the Ministry of Transport road-map report [20].

- **Reforms.** To stimulate competition and diversify the services provided, the government is undertaking decisive sectoral reforms, which have become a new starting point in the development of the country's aviation sector. The establishment of new aviation companies and private carriers such as Humo Air, Qanot Sharq, Panorama Airways, Centrum Air, Silk Avia, and Uzbekistan Helicopters has given a good impetus to competition and to the development of regional air transportation in the country and Central Asia. There are already eight airlines in Uzbekistan. To promote competition in the industry and attract new resident airlines, the government began allocating state subsidies at the rate of 25% of the ticket price and offering exemptions from customs duties on imported aircraft-maintenance equipment, components, and related equipment until 2028 [22, 23].
- **Logistics hub.** The existence and successful functioning of the international multifunctional logistics hub for humanitarian aid, the Termez Cargo Center, not only opens up potential opportunities for establishing other large logistics terminals in the country but also improves the country's image by assisting the world community and international organizations in their humanitarian activities in the region. This serves as a good example of mutually beneficial cooperation and the importance of the country's transport system in transport and logistics.
- **Aircraft fleet.** An updated aircraft fleet is also a good indicator of compliance with global standards.

5.3 Challenges, Opportunities, and Prospects

It should be emphasized that, alongside all the advantages, there are a number of challenges and shortcomings that need to be addressed to improve the attractiveness and competitiveness of the country's aviation industry.

- **Infrastructure.** Considering international requirements, the country's aviation infrastructure is still underdeveloped. Existing problems must be addressed comprehensively, including increasing throughput capacity; reconstructing runways and strengthening taxiways; addressing the lack of aircraft-maintenance machinery, equipment, and components; commissioning new engineering-service centers and competitive in-flight catering services; providing an appropriate terminal complex and station area; establishing relationships with hotels or building an airport hotel; and developing restaurant, shopping, and entertainment facilities. Foreign experts should be attracted to modernize and reconstruct the country's operating airports according to international standards. Related service industries and infrastructure must also be developed to form a fully functioning hub. The creation of new chemical-technological clusters and improvement of related infrastructure based on duty-free zones will assist the development of hotel and restaurant businesses and commerce, while giving for-

eign citizens an opportunity to become acquainted with the country's national culture.

- Despite the commissioning of the Uzbekistan GTL synthetic liquid-fuel plant, unique among CIS countries in terms of technology and compliant with green-economy standards, there remains a shortage of the fuel necessary for refueling transit aircraft, one of the most important factors in the functioning of an aviation hub. The plant was intended to supply the national aviation industry and reduce import dependence. Its capacity needs to be increased, and new refineries of this type should be opened in the long term.
- **Personnel.** There is a shortage of qualified personnel in both aviation and related service industries. Addressing this issue requires expanding the scientific and technical base; creating new programs at the country's universities and colleges to meet demand for internationally qualified personnel in aviation and related industries; establishing special training centers for employee retraining and advanced training; and cooperating closely with advanced foreign educational institutions to improve personnel quality and exchange experience.
- **Institutional reforms.** Despite reforms undertaken by the government to liberalize the aviation industry, monopolistic principles and limited conditions for competition remain in the aviation market. For example, the government continues to support the state-owned national airline and its subsidiary airlines, which contradicts Porter's principles of competitive advantage. Such support could be justified during the pandemic period, when most international airlines suffered substantial losses. However, continuing such support will undermine the aviation sector's future competitiveness.
- Tax exemptions and preferences granted to aviation companies lead to a shortfall in potential tax revenues to the state budget, while government subsidies cause damage both at a purely economic level and on a global scale by deterring improvements in global competitiveness.
- For an objective assessment of the state of the country's aviation market, indicators such as the number of tickets sold per capita and the number of flights relative to competing countries should also be reviewed. Unfortunately, this aspect cannot be analyzed because of the limited data available in open sources.
- It is necessary to accelerate Uzbekistan's accession to the World Trade Organization. This will open up additional opportunities for both the development of trade relations and expansion of the aviation-industry market.
- Foreign aviation and helicopter companies should be at-

tracted to cooperate, and national air-carrier brands should be promoted abroad, creating mutually beneficial and fruitful cooperation.

- New aircraft and helicopters need to be purchased to provide high-quality business services and develop tourism.
- To meet urban-planning requirements, it is also worth considering the construction of a new, modern air harbor outside the city, with a capacity of at least 50 million passengers per year.
- **Economic aspects.** The country has comparatively high tariffs for air services. Uncompetitive and expensive fares cause losses through the loss of potential customers and underloaded aircraft, among other effects. This burdens the state budget because the unprofitable activities of air carriers are subsidized from tax revenues. To solve this problem, smart marketing of national tourism products should be properly organized and provided, increasing foreigners' interest in domestic tourism products. Alisher Annazarov, founder of the SilkJet low-cost carrier, proposed combining the hub-and-spoke model with the low-cost-carrier model. He described hub and spoke as an effective infrastructure solution in terms of logistics and argued that combining these two progressive models would stimulate the country's air-transportation market and make flights more affordable for both tourists and Uzbekistan's population [24]. Aziz Abdukhakimov, Minister of Ecology, Environmental Protection and Climate Change and former Deputy Prime Minister, emphasized the goal of transforming Uzbekistan's open airports into transit hubs as quickly as possible [25].

6. CONCLUSION

Uzbekistan has good potential for developing aviation hubs, which can be used rationally. Today there is growing interest among the International Organization for Migration, the International Committee of the Red Cross, the European Union, other international structures, and other countries in using the country's transit potential. Based on growing demand, several cargo hubs need to be created in the country. Increasing passenger-transit numbers and cargo transportation should form the basis of Uzbekistan's development strategy as an aviation hub.

As a result, the effective and timely implementation of the stated tasks will assist in realizing the goals of the Uzbekistan–2030 Strategy. The development of aviation hubs in the country can become a competitive advantage and a guarantee of stable, long-term development for the aviation and tourism industries and for the entire national economy.

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