

Investigating challenges in development of Iranian aviation industry

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ABSTRACT

This paper presents an investigation on existing challenges in developing aviation industry in Iran. The proposed study designs and distributes a questionnaire among all specialists who are involved with design, production and distribution of aviation industry in Iran. Our interview has revealed that there were approximately 200 potential experts as population of our survey. The designed questionnaire consists of six parts in Likert scale in terms of linguistic terms. All six parts of the survey was designed based on four segments of aviation industry in Iran. Based on the results of this survey, appropriate structure for the legislative, availability of sufficient funds for purchasing private planes, public access to the airports and airport services and availability of supply chain management and technical service centers are the most important challenges in this industry. In addition, availability of various infrastructures such as runways, hangars and maintenance centers to access the industrial towns and insufficient support from relevant organizations such as the ministry of commerce, industry and mining, civil aviation organization and other organizations in the manufacturing and aircraft are among other most important challenges in developing this industry in Iran.

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1. Introduction

Aviation industry plays important role on developing economy in different industries such as tourism industry (Smyth et al., 2012). Aviation industry is considered as the basic infrastructure requirements in any country and it is the best way to help regions with no access to traditional transportation facilities such as train, roads, etc. There are literally many advantages for developing aviation industry. Graham (2009), for instance, investigated the relative importance of commercial revenues to today's airports. She reported that, on average, commercial revenues are accounted for about half of all revenues with retail being the most important commercial source. It explored some of the key factors, such as consumer trends, security developments and political changes, which had led to a much more challenging time for commercial managers since the late-1990s. With growing pressure to

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control levels of aeronautical revenues, even greater target on commercial revenues could be required in the future.

Lin (2012), in an assignment, investigated financial performance and customer service by examining activity-based costing of 38 international airlines. The study argued that traditional cost accounting methods allocate carrier's indirect costs could be misleading and recommended using activity based cost accounting to estimate the costs. Hooper et al. (2011) examined the changing role of civil aviation in the Persian Gulf region and mapped the impact of technology and social and economic development on air networks. They concluded that Persian Gulf is now a central place in global trade and travel flows. Wolf (2001) discussed Network effects of bilateral by looking at implications for the German air transport policy.

Understanding challenges in developing this industry helps us take necessary actions to detect and remove them as much as possible. Developing aviation industry has both advantages and unavoidable disadvantages such CO₂ emission and green gas effects. Preston et al. (2012) suggested that a shift in policy governance from the EU to ICAO could help alleviate some of the concerns, which have been raised and a global scheme could facilitate a greater scope for emissions reductions. Pitt and Smith (2003) waste management efficiency at UK airports and explained possible challenges in this industry.

Shaw (2005) performed a comprehensive study on challenges on meeting demands for safer aircraft by investigating stringent regulations pose a challenge to the aviation industry. Linz (2012) studied various scenarios for the aviation industry based on a Delphi-based analysis for 2025. Linz reported that the passenger, business aviation, and air cargo segments would be faced with 27 possible high-impact developments. These issues include long-haul growth primarily linked to emerging countries, a number of substitution threats, liberalization and deregulation. In addition, increasing industry vulnerability, finiteness of fossil fuels, and emissions trading are among other important issues to blame. According to the survey, there will be some surprise transportation facilities such as the emergence of low-cost cargo carriers and air cargo substitution by sea transportation. The study also identified various wildcard scenarios such as natural catastrophes, era of virtual communication, and home-producing "fabbing" society.

Heracleous and Wirtz (2009) studied how Singapore Airlines had achieved its outstanding performance and sustained its competitive advantage, through efficiently using a dual strategy including differentiation through service excellence and innovation, together with simultaneous cost leadership in its peer group. They investigated the organizational elements permitted the company to do so and showed its strategic alignment using a vertical alignment framework, and concluded by highlighting the some important challenges ahead.

Lyon and Francis (2006) investigated commercial issues surrounding managing airports in New Zealand. Airport managers normally face pressures from changing airport-airline relationships, low cost airlines, proposed new airports and the growing importance of non-aeronautical revenues in achieving commercial objectives. Bieger and Wittmer (2006) in other study described that Air transport and tourism are interlinked. They explained that tourism was a driving factor for and, in some cases, a stimulator of change in air transport. The relative importance of this industry in felt in the development of new business models such as charter airlines. Air transport opened new destinations and tourism forms such as long-haul excursions and these interlinks could be analyzed in a systematic model. For the strategic development of destinations, a clear airline policy and air access strategy are definitely necessary.

Pentelow and Scott (2011) discussed that Nations with tourism dependent economy infrastructures are concerned about the inclusion of aviation in greenhouse gas mitigation policy for international bunker fuels. The primary concern is that such policies could increase the cost of traveling by air and consequently it could reduce visitor arrivals to long-haul, tourism-dependent destinations, often small

island developing states. Pentelow and Scott (2011) implemented a tourism arrivals model to study the implications of currently proposed climate regulations for the Caribbean island. They reported that under current proposals for both mitigation and adaptation focused climate policy, reductions in tourist arrivals would be negligible. One of other important challenges in aviation industry is associated with reliability and maintenance of required parts.

Marais and Robichaud (2012) investigated the contribution of maintenance, both in terms of frequency and severity, to passenger airline risk by investigating three various sources of data from 1999 to 2008: 769 NTSB accident reports, 3242 FAA incident reports, and 7478 FAA records of fines and other legal actions taken against airlines and associated organizations. They analyzed various safety related metrics and developed an aviation maintenance risk scorecard, which collected these metrics to synthesize a comprehensive track record of maintenance contribution to airline accidents. They reported that for instance that maintenance-related accidents were approximately 6.5 times more likely to be fatal than accidents in general.

The analysis of accident trends indicated that this contribution to accident risk had remained continuous over the past decade. The other findings of this analysis of incidents and FAA fines and legal actions also disclosed similar trends. They reported that, at least, 10% of incidents involving mechanical failures such as ruptured hydraulic lines were associated with maintenance, recommending that there could be issues surrounding both the design of and compliance with maintenance plans. In addition, 36% of FAA fines and legal actions involved inadequate maintenance, with recent years indicating a decline to about 20%, which could be a reflection of improved maintenance practices.

In this paper, we investigate different challenges influencing aviation industry in Iran. The proposed model of this paper first presents details of our survey in section 2 and section 3 explains details of results, finally, the paper ends with concluding remarks.

2. The proposed method

The proposed model of this paper designs and distributes a questionnaire among all specialists who are involved with design, production and distribution of Aviation industry in Iran. Our interview with some experts has revealed that there are approximately 200 potential people exist as population of our survey and we used their insights for this survey. The questionnaire was designed consists of six parts and in Likert scale in terms of linguistic terms of very much, much, average, low and very low. All six parts of the survey was designed based on four segments of Aviation industry in Iran. Table 1 shows details of all related questions used for this survey.

Table 1
Details of the questions

Category	Questions
What are the challenges related to the field of space flight?	1, 8
What are the challenges related to infrastructure and manpower?	2, 4, 13, 16, 20, 21, 26
What are the challenges of management and technology?	3, 5, 6, 9, 10, 17, 18, 19, 24
What are the challenges in the field of environmental law?	7, 11, 12, 15, 22, 23, 25, 26, 27, 28, 29

Cronbach alpha was calculated as 0.92, which is well above the minimum desired level of 0.70 and this means that the questionnaire is valid. We have used single-tail t-student to validate the results of the survey. Next section, we present details of our findings based on the survey conducted.

3. The results

In this section, we present details of our survey, in terms of all 29 questions of the survey. Table 2 presents details of the questions along with their t-student values.

Table 2

The results of t-student

Question	t-student	Ranks
Appropriate structure for the legislative	20.67	1
Availability of sufficient funds for purchasing of private planes	20.46	2
Public access to the airports and airport services	20.03	3
Availability of supply chain management and technical service centers	20.03	3
Availability of various infrastructure such as runways, hangars and maintenance centers to access the industrial towns	19.92	4
Support from relevant organizations such as the Ministry of Commerce, Industry and Mining, Civil Aviation Organization and other organizations in the manufacturing and aircraft	19.92	4
Active airports towns	19.39	5
Stringent aviation consulting centers for necessary confirmation	18.90	6
Time required to process and receive necessary approval to issue rules	18.42	7
Economic problems of aircraft manufacturers	18.42	7
Sale of aircraft design and manufacturing	17.74	8
General aviation rules and regulations	17.74	8
Iran and its usage of space flight	17.15	9
Number of pilot schools	14.84	10
Operations and maintenance facilities for aircraft at low level	14.15	11
Assembly and sales of foreign aircraft	12.79	12
Availability of technical services at the destination airport.	11.79	13
Number of partnerships with financial institutions to finance	11.77	14
Number of mediated technology for global business / technology transfer	11.76	15
Number of cooperation with other organizations, industries, etc.	11.75	16
Restrictions on the number of choices for space flight	10.88	17
Existence of different labs and research centers	10.68	18
Availability of airport in tourism areas	9.98	19
Access to necessary fuel	9.84	19
The cost of design and manufacture of aircraft in the country compared with other countries	8.49	20
Problems and lack of technology or lack of raw materials for aviation	8.49	21
Expert proficient to meet the requirements of law, regulations	8.49	22
Log flexibility in policy and politics graduate training pilots	7.9	23
The number of airports in the country	6.13	24

As we can observe from the results of Table 2, appropriate structure for the legislative, availability of sufficient funds for purchasing of private planes, public access to the airports and airport services and availability of supply chain management and technical service centers are the most important challenges in this industry. In addition, availability of various infrastructures such as runways, hangars and maintenance centers to access the industrial towns and insufficient support from relevant organizations such as the Ministry of Commerce, Industry and Mining, Civil Aviation Organization and other organizations in the manufacturing and aircraft are among other most important challenges in developing this industry in Iran.

4. Conclusion

In this paper, we have presented an empirical investigation to find possible challenges confronting aviation industry of Iran. The proposed study designed and distributed a questionnaire among 200 most important experts in Iranian aviation industry. The survey was looking to find important barriers associated with this industry and setup appropriate actions to remove them. Based on the results of the survey, appropriate structure for the legislative, availability of sufficient funds for purchasing of private planes, public access to the airports and airport services and availability of supply chain management and technical service centers are the most important challenges in this industry. In addition, availability of various infrastructures such as runways, hangars and maintenance centers to access the industrial towns and insufficient support from relevant organizations such as the Ministry of Commerce, Industry and Mining, Civil Aviation Organization and other organizations in the manufacturing and aircraft are among other most important challenges in developing this industry in Iran. Based on the results of this survey, it is important for government to create appropriate rules and regulations to help this industry grow faster. Presently, no financial agencies such as banks are interested in giving loans to investors and this makes the industry an unattractive. The country needs to develop the culture of introducing people to use aviation facilities for domestic travels. The country also needs to help private sector to have more involvement in this industry as suppliers.

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