Analysis on the Obstacles to the Development of Hubei International Logistics

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Abstract. China's aviation logistics have the characteristics of early origin and slow development. The SF airport project has been approved, but what factors may hinder its development and how Shunfeng Airport responds to these obstacles. This paper collects relevant data and refers to domestic and foreign aviation logistics cases, summarizes the 10 obstacles to the development of the airport in SF Express, and uses ISM analysis and computational classification to conclude that the service industry is backward, economic and foreign trade volume is low, and airspace and site resources are strained. Driver-inhibiting factors: The lack of core resources, large capital expenditures, and unreasonable route planning during the transition of Shunfeng are reliance-based hindrances; and recommendations are made based on the classification of obstacles to provide reference and guidance for the future development of the airport in Shunfeng.

1. Introduction

The development of foreign markets in the field of aviation logistics has gradually matured. Many foreign scholars have made profound achievements in the operation and management of aviation logistics: Hong S et al. analyze the decisions of air traffic controllers and make predictions at the time of departure, starting from the nearby airports. With the arrival of traffic density and the controller's previous decision on the DCT as a variable, a logistic regression model was established and a flight test was conducted. The prediction accuracy of the experimental results reached 79%. This method is expected to be used in outbound management \cite{1}. Azadian F, Murat A, Chinnam RB models the operational problem of a custom contract manufacturer seeking to integrate production scheduling and transportation planning to improve product performance as a mixed-integer programming model and proposes an accurate dynamic programming model for heuristic algorithms To solve the problem, and through a series of experiments proved that the analytical algorithm can effectively test the case, and even solve complex events close to the optimal \cite{2}.

The research on aviation logistics in China focuses on the reference of how to study the advanced foreign experience, the research on the construction of aviation logistics system and the research on the value chain of aviation logistics industry. Cao Yunchun and Xu Cheng reviewed the domestic literature on aviation logistics from 2009 to 2015 in terms of research content, research methods, and location of the value chain of the aviation logistics industry, and proposed the main points for the future of these three aspects. Development direction \cite{3}, Li Shanling, Wang Peng, and Qiaomu use a comprehensive evaluation model based on information entropy to propose comprehensive weights combined with subjective weights and objective weights, and to design an evaluation index system...
suitable for the Beijing-Tianjin-Hebei region's aviation logistics and logistics in the Jing-Jin-Ji region. Ability to analysis [4]. Wu Guofei and Chen Gongyu used the evolutionary theory of regional economic development to study the main phases and dynamic mechanisms of the development of airport economy, and then put forward the collective development model and thinking of Guangzhou's airport economy for the development status of the airport airport economy [5]. Liu Chunling, starting from the case of Memphis, Hong Kong, and Incheon Aviation Economic Zone, studied and compared the similarities and differences between various aviation economic industrial structures, and studied the general laws, common characteristics, and important conditions of the aviation economic zone's industrial development. The development of the aviation industry in the Comprehensive Test Area proposed [6]. Under the background of supply-side reforms, this paper analyzes the obstacles to the future development of the SF Express Airport under construction through the development status of the Nanjing Distribution Center, the Shanghai Pudong Airport Large Freight Distribution Center and the Memphis Airport, and obtains relevant obstacles. A solution strategy will provide some reference and guidance for the SF airport project.

2. Analysis of Impediments to the Development of SF Express Airport
According to the published data of China Logistics Yearbook, China Logistics Development Report, etc, together with the actual development of domestic and foreign air cargo companies, including EMS's aviation express delivery and distribution centers, Memphis Airport, and Shanghai Aviation Hub, and related logistics experts After communication and exchange, this article will summarize the obstacles to the development of SF Express from the three aspects of the development of Ezhou, the development of SFG and the development of other aviation hubs in China.

2.1. Obstacles related to the development of Ezhou
The approval document has confirmed that the SF Express airport is located in Ezhou, the vacant land resources that can be exploited and utilized are abundant, and it is endowed with unique advantages in development. However, with the central location in Hubei, the export volume of Ezhou is far from satisfactory. According to the latest customs statistics and comprehensive national economic data, Ezhou's foreign trade volume ranked 81st in the country in 2016, a difference of several dozens between Wuhan and Huangshi. Ezhou mainly relies on such traditional production as steel, cement, and building materials, and belongs to the manufacturing chain in the industrial chain. Ezhou's GDP in recent years also shows that Ezhou is a traditional industry-oriented city, and its industrial base is weak, and the corresponding service industry is lagging behind. Hubei Province is a large education province in China, and the strength of science and education is among the highest in the country. However, in Ezhou where is only one vocational college-Ezhou Vocational University. The slow increase in the population growth rate in Ezhou indicates that the journey for the introduction of talent is arduous, and the shortage of human resources and educational resources means that the most basic aviation ground services in the aviation industry may require training from scratch.

2.2. SF’s own development obstacles
The development of Yuantong Aviation has so far successfully established air cargo trunk line networks in East China. Domestic and foreign courier companies are actively expanding their business territory, and through the data released by SF Express last year, SF Holdings had a record revenue of RMB 57.4 billion, but behind this report card, there is a plate hidden in the business – SF Business. “Shunfeng Hacker” and other projects are like sinking in the sea, from 2013 to September 2015, the total loss of SFG reached 1.606 billion yuan, making SF Express forced to backdoor listing; establishing SF airport project goes hand in hand with other projects. Although the late “New Retail” and SF Express Airport can complement each other, the current total investment in the airport is expected to reach nearly 40 billion. Although the airport engineering construction fee has been jointly raised by the Hubei Provincial Government and Shenzhen Shunfeng, it has still been funded by the SFG and the amount of funds required for the development of multiple projects cannot be discounted.
Before choosing SF Logistics, SF Express did not specially train professional aviation logistics personnel.

2.3. Impediments to the development of domestic airport logistics

Nanjing Logistics Distribution Center and Capital Airport have started earlier than Shanghai Aviation Hub, but it was still catching up with the Shanghai aviation hub. It was mainly because of the adequacy of airport resources. Airport airspace and adequate resources were one of the most basic conditions for airport construction. In the process of constant changes in the market, flexible airport spare resources are adapted to the market. Insufficient airport resources will often lead to the inability of the business to fully develop, and it is unable to respond flexibly to changes in the market. This is largely a major factor leading to the backwardness of the logistics hub center; on the other hand, there are only sufficient airport resources, but there are no reasonable routes. Planning may be less effective. Route planning is affected by the one-way and seasonal influence of freight logistics, and the single-line operation of air cargo transportation often occurs. In addition, the types of cargo carried by air cargo are different. Packaging specifications of different cargoes are different and are limited by the volume of the aircraft itself and the maximum loading weight of the design. This has caused some obstacles to the transport of large cargoes or large quantity of goods, making it difficult to guarantee the safety of flight. At the same time, air transport is more demanding than land transport, and the system is more complex and sensitive—it is vulnerable to the external environment. In severe weather such as heavy fog and heavy rain, the safety of flight is difficult to guarantee, and aviation logistics require higher maintenance costs. The above summarizes the 10 obstacles that hinder the development of the airport in Shunfeng, and give it a mark (see Table 1 for details).

| Symbol | Obstructing factors | Obstructing factors | Symbol |
|--------|---------------------|---------------------|--------|
| S₁     | The service industry is behind | Big capital expense | S₆ |
| S₂     | Education, lack of human resources | Unreasonable route planning | S₇ |
| S₃     | Low volume of economic foreign trade | Airspace and site resources are strained | S₈ |
| S₄     | The lack of core resources in the transition process | Vulnerable to external conditions | S₉ |
| S₅     | Professional aviation talent shortage | Airport maintenance costs high | S₁₀ |

3. Build a model

The interpretation of the structural model is based on the theoretical basis of the research problems. The relevant elements are extracted, and the direction in which the determinants of the data or the evaluation influence each other is combined. After the directed graph is drawn with the direction as the target, the logic operation is performed. The adjacency matrix and reachability matrix are obtained. Finally, a corresponding model is established based on the decomposed reachability matrix.

3.1. Obstruction factor correlation analysis

When using ISM to analyze the impact of obstacles, how to determine the direction of its impact is particularly important. This article will use the V, A, X, and O symbols in the ISM method to represent the directionality of the interaction between factors (see Table 2 for details).

| S₁ | S₂ | S₃ | S₄ | S₅ | S₆ | S₇ | S₈ | S₉ | S₁₀ |
|----|----|----|----|----|----|----|----|----|-----|
| O  | V  | V  | O  | O  | O  | O  | X  | O  | O   |
3.2. Establish Adjacency Matrix and Reachability Matrix

By the principle of ISM, the relationship between various factors is transformed into an adjacency matrix representation. According to the reachability algorithm, the adjacency matrix $A$ is used to derive the reachability matrix $M$ using the MATLAB algorithm.

$$A = \begin{pmatrix}
1 & 1 & 1 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\
0 & 1 & 0 & 0 & 1 & 1 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 1 & 0 & 0 & 1 & 0 & 1 & 0 \\
0 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 \\
0 & 0 & 1 & 0 & 1 & 1 & 1 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 0 & 0 \\
1 & 0 & 1 & 0 & 0 & 1 & 1 & 1 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 1 & 0 & 1 & 1 & 1 \\
0 & 0 & 0 & 0 & 1 & 0 & 0 & 1 & 1 & 1
\end{pmatrix}$$

$$M = \begin{pmatrix}
1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0 \\
0 & 1 & 0 & 0 & 1 & 1 & 1 & 1 & 1 & 0 & 0 \\
1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0 \\
0 & 0 & 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 0 & 0 \\
1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 1 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 & 1 & 1 & 1 \\
0 & 0 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 1
\end{pmatrix}$$

3.3. Establishing an Interpretation Structure Model

After the above calculations, the reachability matrix $M$ is obtained. After four times of reclassification and reordering of the reachability matrix $M$, the final ranking results of the influence factors are divided: the top factor is 6; the second layer includes: 4, 7, 10; third-tier factors are 9, 5; fourth-level factors are 2; the bottom-level factors include 1, 3, and 8.

3.4. Analysis of Obstruction Factor Results

After the classification of ranks is obtained, the driving force and dependence of each factor are calculated, and the dependency is the abscissa. The driving force is the ordinate, and the distribution map of the factors is obtained (see Figure 2 for details).

From the graph, the obstacles are roughly divided into dependent and driven factors. The foreign trade environment, backwardness of the service industry, and airport resources in Ezhou are driving-type obstacles. The driving factor should be regarded as a fundamental factor and needs to be treated with emphasis. In the transition process of SF Express, the lack of core resources, unreasonable route...
planning and huge amounts of funds is dependent factors, and comprehensive governance methods should be adopted to mitigate their impact on the entire system.

![Figure 2. Coordinates Distribution](image)

4. Countermeasures and Prospects

SFG cannot improve all the obstacles alone. After obtaining approval, SF Express should actively develop the development map and development strategy with the government. In the early stage, a flexible low-cost strategy was adopted to recruit shops, promote economic development in the region, and form a corresponding industrial value chain. However, actively recruiting shops does not mean that “respondents do not refuse”, and related freight merchant management systems need to be formulated in advance to avoid chaos in the air cargo market and low freight inefficiencies; SF Express Airport is to carry out global air cargo transportation along with business areas. With the expansion, tens of thousands of cargoes will be transferred to the logistics hub. Therefore, adequate airspace time and airport security resources are the basis for the orderly resettlement of goods, and they are also basic preventive measures for the surge in cargo volume. Airports should design the functional layout of the airport in the early stage of construction. During the construction period, the layout should be well planned, and general-purpose devices such as cameras and shelves should be installed in advance. Although this measure will greatly increase the cost, it is expected to be converted into goods. The warehouse is ready and can serve the multimodal mode better at peak freight rates. On the other hand, changes in market demand are difficult to predict, and the scale of the future is currently uncertain, but regardless of the size of the airport, it is still The key element of market demand is closely related. In the initial period of completion of the airport, it is necessary to avoid the occurrence of oversaturation of cargo traffic and a shortage of storage space. According to the size of the airport, as far as possible, the control of airport operations tends to be stable. At the same time, at SF Airport at the center, a number of express delivery points can be established, or they can be combined with other express delivery points to form coverage to meet the elastic demand of the market.

Construction of SF airport has been put on the agenda, but the talent reserve in Ezhou is seriously insufficient, especially professional aviation logistics personnel. Previously, Shunfeng spent a great deal of capital to hire aviation logistics talents, but not only did it consume a lot of resources, but at the same time, these recruited talents were essentially similar to the role of “temporary workers”. They were not familiar with the company’s culture and had no deep feelings, making the company’s core Cohesion is not strong. However, aviation logistics talents are very important to the status of air cargo, and the importance of professional talent reserves is self-evident. Although Shunfeng may choose to cooperate with the neighboring Wuhan University in Ezhou, it is difficult for Ezhou to retain its talents in its own hard conditions. While SF Group cultivates professional aviation logistics personnel, it must establish a sound aviation logistics management system, vigorously promote its own corporate culture, and actively cooperate with the Ezhou government to cultivate a group of professionals.
Compared with sea and road transportation, air transportation is more demanding. The aircraft's traffic volume is fixed. It can't be as much as trains can transport cars. The security inspection process of aircraft is more rigorous and complicated, and it takes less time to travel, but the time for security inspection is greatly increased; There are also many influencing factors in the process of takeoff and flight. If the route planning is not reasonable, it will not only reduce the efficiency, but also increase the extra cost. A reasonable route planning is the basis of the entire aviation logistics. Do not blindly imitate other airports during route planning. To meet the actual situation, we must pay attention to the connection with railways, highways, and other modes of transportation, integrate and reorganize logistics resources, and reasonably arrange the access ports for airline and land cargo transportation, so that air and land transportation can be smoothly connected and transport efficiency can be improved.

The pursuit of the highest degree of customer satisfaction is not a short flight time, but the use of a comprehensive domestic logistics and logistics network system, air transport and land transport, maritime transport comprehensively improves the distribution efficiency of the entire process.

Airport construction is relatively easy, but it is really necessary to achieve high-efficiency transition operations for UPS Memphis. It is a high requirement for hardware facilities, information technology, and personnel teams. Behind any details, in the process of construction and operation, it may require a lot of expense. Resources. This article summarizes the main obstacles to the development of SF Express and determines the direction of these factors in the complex system of SF Express Airport. However, it is necessary to further study the important aspects such as how to define the aviation logistics capacity and how to deal with the real-time changing market demand in SF Express.

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