RESEARCH ON OPTIMIZATION OF GATE ASSIGNMENT IN HUB AIRPORT

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ABSTRACT

With the rapid development of the national economy and the gradually increasing attention of the state to the civil aviation industry, the throughput of major airports across the country has increased rapidly. Regardless of the epidemic factors, the civil aviation industry has been in the stage of rapid development. The passenger and cargo throughput has increased sharply, and the arrival and departure of aircraft has become particularly busy. The problem of airport congestion is common in many airports, accompanied by a large number of flight delays. In order to reduce this congestion problem, we need to reasonably allocate very limited gate resources. At present, many airports have chosen the method of reconstruction and expansion to solve the congestion problem, but this is not the optimal method. How to maximize the scene operation efficiency, customer satisfaction and airline revenue become more and more important. Previous studies often focus on a single subject, rarely considering the interests of airlines, passengers and airports at the same time.

In this paper, the multi-objective model is used to study the gate assignment of hub airport. The multi-objective model is established based on the objective function of the balance of the occupancy time of the gate, the shortest average walking time of passengers and the minimum total fuel consumption. The gate assignment is studied by comprehensively considering the interests of the airport, airlines and passengers. The key of multi-objective model optimization problem is that each sub objective restricts each other. Therefore, this paper aims to solve the Pareto optimal solution of the model. Considering the complexity of solving the problem, this paper will use genetic algorithm to solve it.

KEYWORDS: The Multi-Objective Optimization Model, Genetic Algorithm, Pareto Optimal, Gate Assignment Problem.

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