

Project Title: Impacts of Fairness on Cabin Crew Scheduling: Crew Preferences and Allowances

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Abstract

Fairness in workplace is crucial. Many companies strive their best to create A fair employee experience to maintain good spirits and thus competitiveness. To maintain fairness, it requires transparent systems and implementation mechanisms. In airline industries, transparent systems in regulating salary, promotion, holiday, etc. Are usually present to facilitate the culture of workplace fairness. To treat cabin crew well, airlines have implemented A crew preference scheme, which allows cabin crew to express their preferences on various items, E.G., Holiday, destination city, teammates, etc. Then, airlines will try to satisfy these items to the greatest extent during the crew scheduling process, I.E., During the generation of their rosters (itineraries). Crew scheduling problems aim to determine the proper assignment of crew to provide services on flights in the flight networks. Thus, the quality of the crew schedules generated significantly affects not only the airline operating costs but also the quality of life of the crew members. This is because, to airlines, A high-quality schedule can minimize the total idling or total transit time between flights. As A result, the total number of crew members required to support flight operations can be reduced. To crew members, the quality of crew schedules influences their work patterns, holidays, teammates, etc., And hence implies the number of desired preferences being fulfilled.

In the economic point of view, airlines can generate rosters entirely for their own benefit as long as the rosters satisfy the regulations governed by the civil aviation department. However, many renowned airlines care for their crew members and significantly consider the fulfilment of crew preferences. However, in the existing implementation mechanisms, crew preferences are only considered during the last phase of crew scheduling, which is called the crew assignment phase. Therefore, the fulfilment of crew preferences is limited. More importantly, fairness in the number of preferences being fulfilled between different rosters is not being considered. As A result, certain crew members may be assigned schedules that are more favorable to them than to others, thereby causing unfairness. Furthermore, in the existing airline practice, (in particular legacy airlines), the salary of A cabin crew consists of the basic salary plus allowances. If crew members are being scheduled with only turnaround flights, the crew members will not earn any allowances due to the lack of overseas staying. As A result, their salaries will be lower and again it causes unfairness. This kind of unfairness recently has been seriously raised and complained by cabin crew as seen on headline news (E.G., Cathay pacific airways), "cabin crew member rousing for A fair crew scheduling mechanism". Motivated by the abovementioned issues, we propose to develop A novel crew scheduling with fairness in crew preferences and allowances (CS-FCPA) model. Our objective is to study the impacts of considering fairness in crew preferences and allowances on airline operating costs and crew members. To achieve so, long-haul and short-haul flights should be scheduled together during crew scheduling because of the assignment of overseas staying. However, as this will exponentially increase the problem complexity, our proposed novel CS-FCPA model combines the benders decomposition method with the column generation algorithm to decompose the problem and reduce the computational burden. This model is novel in the field of study. Moreover, we will propose novel acceleration strategies based on the problem characteristics. This project provides not only theoretical breakthroughs in crew scheduling studies but also practical contributions to airline industries and cabin crew. Our findings can provide novel insights into airline cabin crew management which consequently are essential to the development of the airline industry. The insights also provide scientific guidance on the implementation of fairness in workplace culture in airline industries.