

ABSTRACT

The air cargo industry plays an important role in the economy. Businesses and the general public use air freight services to deliver their goods because of faster delivery times than by land and sea. PT X Airlines is an air cargo airline that began operations in special air cargo delivery in 2021 using Boeing 737-300F aircraft. As demand for air cargo deliveries increased, PT X Airline added two aircraft in 2022, resulting in the volume of cargo transported by PT X Airlines reaching 29 tons, or an increase of 59.44% from the previous year. Based on this, PTX Airlines has added 20 pilots to maintain operational smoothness, but PTX Airlines is faced with the problem of setting up the pilots in operation. Crew scheduling becomes one of the operational problems that, if not properly managed, can result in losses as it affects human resources as a driver of operational smoothness. The research was conducted at the Pilot Scheduling Center at PT X Airlines, located at home base in Jakarta, with a case study on a Boeing 737F using soft system methodology and a genetic algorithm. Soft system methodology is used in the process of simplifying the complexity of phenomena occurring in the company concerning the flow of scheduling and provides a structured research flow on changes in the working system in 7 stages: identification of problems with multiple perspectives (world view), depiction of situation problems with rich picture diagrams, definition of systems relevant to CATWOE analysis, building conceptual models, comparing conceptual models with the real world, and proposals for improvement actions and improvements. In the phase of repair action, the genetic algorithm is used as a repair solution and also designed as an application to help schedule. The result of the research is that the pilot scheduling process becomes easier and faster with the presence of an application that uses genetic algorithms. The calculation of the minimum crew cost is represented by a genetic algorithm fitness value, so the smallest fitness value is the best solution. From the experiment, population size 5, generation number 20, crossover probability 0.80, and mutation probability 0.01 resulted in a minimum fitness score of 120.633 with a processing time of 4 minutes and 1 second.

Keywords: pilot scheduling, soft system methodology, genetic algorithm, air cargo