

Kombinasi model optimasi airport runway allocation dan gate assignment : studi kasus terminal 1 Bandara Soekarno Hatta = Combination of airport runway allocation and gate assignment optimization model case study of terminal 1 Soekarno Hatta International Airport

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Deskripsi Lengkap: <https://lib.ui.ac.id/detail?id=20414170&lokasi=lokal>

Abstrak

Pertumbuhan industri penerbangan telah mendorong peningkatan permasalahan runway allocation dan gate assignment di bandara. Permasalahan tersebut mendorong terjadinya permasalahan kelebihan kapasitas dan akan sangat berpengaruh pada tingkat pelayanan bandara tersebut, salah satunya Terminal 1 Bandara Soekarno Hatta. Pada penelitian ini dibuat formulasi model optimasi stokastik yang merupakan kombinasi model runway allocation dan gate assignment, dengan menggunakan 4 fungsi tujuan yaitu maksimalisasi lalu lintas pesawat, minimalisasi keterlambatan, minimalisasi jumlah ungated flights, dan minimalisasi total jarak jalan penumpang.

Model ini dibangun menggunakan genetic algorithm dengan output berupa runway and gate assignment order yang optimal. Dari solusi tersebut dapat dilihat bahwa saat simulasi model mampu menampung rata-rata 98% dari total lalu lintas pesawat, serta penurunan rata-rata sebesar 52% untuk total waktu keterlambatan, penurunan rata-rata sebesar 36% untuk jumlah ungated flights, dan penurunan rata-rata sebesar 13% untuk total jarak jalan penumpang. Kedepannya, diperlukan pengembangan penelitian meliputi pengembangan model berbasis real time, penggunaan algoritma stokastik lainnya, serta pembangunan model berdasarkan persepektif maskapai.

.....The growth of the aviation industry has enhanced the increase of airport runway allocation and gate assignment problem. Those problems led to the overcapacity problem and will affect on the level of service of the airport, Terminal 1 Soekarno Hatta International Airport. This research constructed a model formulation of stochastic optimization model, which is basically the combination of runway allocation and gate assignment, with the objectives are to maximize the aircraft traffic, to minimize the flight tardiness, to minimize the number of ungated flights, and to minimize the total passenger travelling distance.

This model was constructed using genetic algorithm, which the model outputs are the optimal runway and gate assignment order. Based on the optimal solution generated, the model was successfully to accommodate in average 98% of total flights and also was contributed to the 52% average decreasing of flight tardiness, 36% average decreasing of ungated flights, and 13% average decreasing of total passenger travelling distance. This research may be developed in the future by constructing real time based model, using another stochastic algorithm, and building the model by the airline perspective.