

INTISARI

Penelitian berjudul “Optimasi Penjadwalan Shift Customer Service Agent Menggunakan Genetic Algorithm Studi Kasus: Customer Service Center Pizza Hut Indonesia (CSC Solo)” bertujuan menerapkan Genetic Algorithm untuk mengoptimalkan penyusunan jadwal shift Customer Service Agent berdasarkan kebutuhan operasional dan constraint penjadwalan. Penelitian dibatasi pada proses penjadwalan 38 agent aktif dan 134 slot kebutuhan operasional dengan mempertimbangkan data Off Request dan constraint yang telah ditetapkan. Analisis dilakukan melalui pengujian parameter Genetic Algorithm, meliputi Population Size, Max Generations, dan Mutation Rate, dengan fitness sebagai indikator utama serta total penalty, unfilled, dan waktu komputasi sebagai indikator pendukung. Hasil pengujian menunjukkan konfigurasi terbaik berupa Population Size 100, Max Generations 400, dan Mutation Rate 0,01. Penerapan konfigurasi tersebut menghasilkan nilai fitness sebesar 0,0447, total penalty sebesar 21,39, unfilled sebesar 0, dan waktu komputasi 1 menit 24 detik dengan proses berhenti pada generasi ke-152. Hasil tersebut menunjukkan bahwa seluruh kebutuhan slot operasional berhasil terisi, meskipun masih terdapat penalti pada beberapa constraint pemerataan. Pengujian black-box terhadap sistem juga menunjukkan 59 dari 59 kasus berhasil. Berdasarkan hasil penelitian, Genetic Algorithm dapat diterapkan untuk membantu proses penyusunan jadwal shift Customer Service Agent CSC Solo. Sistem yang dikembangkan mampu menghasilkan jadwal berdasarkan kebutuhan operasional dan constraint yang digunakan serta telah berhasil diterapkan pada server sehingga dapat diakses oleh pengguna.

Kata kunci: Genetic Algorithm, penjadwalan shift, Customer Service Agent, optimasi, constraint

ABSTRACT

This study, entitled “Customer Service Agent Shift Scheduling Optimization Using Genetic Algorithm – A Case Study of Customer Service Center Pizza Hut Indonesia (CSC Solo)”, aims to implement a Genetic Algorithm to optimize Customer Service Agent shift scheduling based on operational requirements and scheduling constraints. The study is limited to the scheduling process involving 38 active agents and 134 operational requirement slots by considering Off Requests and predetermined scheduling constraints. The analysis was conducted through testing Genetic Algorithm parameters, including Population Size, Max Generations, and Mutation Rate, with fitness as the main indicator and total penalty, unfilled slots, and computation time as supporting indicators. The test results showed that the best configuration consisted of a Population Size of 100, Max Generations of 400, and Mutation Rate of 0.01. The implementation of this configuration produced a fitness value of 0.0447, a total penalty of 21.39, an unfilled value of 0, and a computation time of 1 minute 24 seconds, with the optimization process stopping at generation 152. These results indicate that all operational requirement slots were successfully filled, although penalties remained on several constraints related to scheduling distribution. Black-box testing of the system also showed that all 59 test cases passed. Based on the results, the Genetic Algorithm can be applied to assist the shift scheduling process for Customer Service Agents at CSC Solo. The developed system is capable of generating schedules based on the operational requirements and constraints used in the study and has been successfully deployed on a server, allowing users to access the system.

Keywords: Genetic Algorithm, shift scheduling, Customer Service Agent, optimization, scheduling constraints.