VEHICLES SCHEDULING AND ROUTING AT CHEMICAL MATERIAL INDUSTRY USING A COMBINATION OF GENETIC AND TABU SEARCH ALGORITHMS

Name : Maya Sagita Walalangi
NRP : 5208 100 106
Department : Information System
Supervisor : Prof. Ir. Arif Djunaidy, M.Sc., Ph.D.

Abstract

Distribution of the products produced by a company requires appropriate vehicles scheduling and routing in order to enable the products to be disseminated and marketed to end consumers as desired. One of difficult problems to be solved in vehicles scheduling for product distribution process is concerned with the determination of the availability and the readiness of vehicles according to a set of predefined constraints.

In this final project, an application that is capable of assisting a chemical industry company in making vehicles scheduling and routing that satisfies certain constraints set by the company is developed using a combination of genetic and tabu search algorithms. Genetic algorithm is used to generate schedules and routes of vehicles in general, while tabu search algorithm is employed to optimize the resulting schedule and routes generated by the genetic algorithm. The combination of these two algorithms should be able to optimize the use of vehicles and minimize the cost of shipping on time delivery.

Experimental results showed that the application using a combination of genetic and tabu search algorithms is able to meet the predefined constraints set by the company. The resulting vehicles scheduling and routing produced by the combined algorithms give smaller scheduling costs in compared to that produced by one of the algorithms being combined. In terms of
computing times, however, tabu search algorithm is the fastest among others.

**Keywords:** Vehicles scheduling and routing, genetic algorithm, tabu search algorithm, the combination of genetic and tabu search algorithms.