Abstract

Problems of distribution and warehousing in the supply chain management becomes a crucial issue. A good distribution of the products will reduce the production cost and increase the efficiency. Distribution problem is better known as the Vehicle Routing Problem (VRP). VRP is a combinatorial optimization problem with a large solution space and difficult solve. The problems increase if each node has a time limit for the service which is called time windows. By the time windows, then the problem becomes Vehicle Routing Problem with Time Windows (VRPTW).

The purpose of this final task is to implement the Particle Swarm Optimization algorithm that suitable for combinatorial problem that able to produce the optimum solution. PSO is an algorithm which is inspired by birds flocking. Initial solution of PSO generated randomly and then directed to produce the optimal solution.

The results showed that PSO is able to provide a near optimal solution for VRPTW. PSO is able to produce an average of relative percentage deviation (RPD) less than 5,3% for dataset 25 nodes. But system's performance will be decreasing with an increasing nodes that are served.

Keywords: supply chain management, VRP, VRPTW, Particle Swarm Optimization