

## Optimizing Logistics for Courier Organizations with Considerations of Congestions and Pickups: A Courier Delivery System in Amman as Case Study

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**Abstract :** Traveling salesman problem (TSP) is a combinatorial integer optimization problem that asks "What is the optimal route for a vehicle to traverse in order to deliver requests to a given set of customers?". It is widely used by the package carrier companies' distribution centers. The main goal of applying the TSP in courier organizations is to minimize the time that it takes for the courier in each trip to deliver or pick up the shipments during a day. In this article, an optimization model is constructed to create a new TSP variant to optimize the routing in a courier organization with a consideration of congestion in Amman, the capital of Jordan. Real data were collected by different methods and analyzed. Then, concert technology - CPLEX was used to solve the proposed model for some random generated data instances and for the real collected data. At the end, results have shown a great improvement in time compared with the current trip times, and an economic study was conducted afterwards to figure out the impact of using such models.

**Keywords :** travel salesman problem, congestions, pick-up, integer programming, package carriers, service engineering

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