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# Vehicle Routing and Shipment Consolidation in a 3PL DC: A Systematic Literature Review of the Solution Approaches

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## Abstract

Many of the manufacturing companies tend to outsource their logistic activities to third party logistics (3PL) providers due to numerous benefits they could obtain. Since 3PL providers provide their distribution services for multiple clients at the same time, managing these activities properly with an optimized cost is challenging for them. So, they are much interested in minimizing the distribution cost which will ultimately benefit the 3PL provider, and thereby the client as well. Shipment consolidation is one of the best and effective cost reduction strategies which could be followed by the 3PL firms, when distributing goods of multiple clients. Vehicle Routing Problem (VRP) which is a well-discussed problem in the literature can be applied here since it is beneficial for the 3PL providers to find the optimal routes to distribute the goods from the central 3PL Distribution Center (DC), while consolidating shipments of multiple clients. Therefore, this literature survey has been carried out to analyze the solution approaches, used in the literature related to VRP and shipment consolidation such that it would help in future research in developing a model to optimize the distribution in a 3PL DC by consolidating shipments of multiple clients. The results of the study have shown that most of the referred papers have used metaheuristic algorithms in solving their models and when the number of nodes are larger, it is suitable to use metaheuristic algorithms. Therefore, it can be concluded that a metaheuristic algorithm would be appropriate when developing a model to optimize the distribution in a 3PL DC by consolidating shipments of multiple clients.

**Keywords:** Consolidation, Third-party logistics, Vehicle Routing Problem, Metaheuristic algorithm