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Selecting delivery patterns for grocery chains Holzapfel/Hübner/Kuhn/Sternbeck

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Abstract:

On a tactical level retailers face the problem to determine on which weekdays stores should be delivered and to set a frame for short term vehicle routing.

Especially in grocery retail weekly repetitive delivery patterns are applied to increase planning stability for the stores and to balance picking workload at the distribution center.

A delivery pattern is defined as a store-specific combination of weekdays on which a delivery takes place. As several processes in the logistics subsystems distribution center, transportation and instore logistics of the retail supply chain are influenced by the delivery pattern decision, an integrated approach is necessary to solve the problem.

Therefore we propose an IP model that considers the decision relevant costs and capacities at the distribution center, in transportation and instore.

We especially focus on instore handling aspects, bundling issues in transportation and associated interrelations.

To solve the trade-off between the different cost components which are aligned to the delivery pattern decision, we propose a simultaneous and a sequential solution approach.

We show significant cost saving potentials by applying the model and approaches proposed using a case from a major European grocery retailer.

An extensive sensitivity analysis gives further insights into cost and capacity effects.

Topic keywords:

Supply Chain Management, Logistics, Transportation, Integer Programming