ABSTRACT

The purpose of this project is to design a decision support system that determines the best possible set of routes for raw material collection from suppliers to Besan Besin San. ve Tic. A.Ş., which is Food and Beverages Site of Unilever. The project consists of two main components; a solution method for the planning of collection routes and its implementation in the form of a decision-making tool. When there are changes in demands or in the current set of suppliers, the tool should be flexible enough to produce updated solutions in response to such changes. The mathematical model involves practical restrictions specified by the company. The decision is a coded implementation of the proposed solution method on a user-friendly interface (CPLEX) which outputs a set of collection routes based on user-specified problem parameters.

About Unilever

Unilever is one of the world’s leading suppliers of Beauty & Personal Care, Home Care, and Foods & Refreshment products with sales in over 190 countries and reaching 2.5 billion consumers a day. It has 161,000 employees and generated sales of €53.7 billion in 2017. Over half (57%) of the company’s footprint is in developing and emerging markets. Unilever has more than 400 brands found in homes all over the world, including Omo, Dove, Knorr, Domestos, Rexona, Hellmann’s, Lipton, Aligida, Magnum and Axe.

OBJECTIVE

Decreasing transportation costs by reducing number of trucks dispatched and the distance traveled by them.

DECISION TOOL

The proposed model is implemented using IBM/ILOG CPLEX optimization software and integrated with Microsoft Office Excel.

MATHEMATICAL MODEL

The problem is formulated as a Periodic Vehicle Routing Problem.

We have successfully designed a mathematical model that adheres well to the problem definition. We have also implemented this math model on CPLEX. After the final stage of implementation, a simulation was performed and we have observed that the transportation cost was significantly reduced.

REFERENCES