A Cloud-Based Decision Support System for Optimal Tea Purchasing and Blending

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Abstract

We investigate the optimal tea purchasing and blending problem at a global FMCG company. The company purchases tea leaves from various markets around the world and processes them in its global network of blending facilities. Tea leaves have different attributes such as taste, color and scent that vary depending on the producer and the season, and can be purchased at different price levels subject to market conditions. Leaves are mixed in blending facilities in appropriate quantities to achieve desired attributes of tea blend products. We formulate the optimal tea purchasing and blending problem as a multi-objective optimization problem. We also describe our experience in building a cloud-based decision support system based on our optimization model, which is used by the company on a weekly basis.

Keywords
Tea Blending, Multi-objective Optimization, Cloud-based decision support system

Biographies

Z. Melis Teksan, Ph.D. serves currently as an Assistant Professor of Industrial Engineering at the Faculty of Engineering at Özyeğin University. She received her B.Sc. and M.Sc. degrees in the Department of Industrial Engineering at Boğaziçi University, in 2009 and 2011, respectively, and she received her Ph.D. degree in the Industrial and Systems Engineering department at the University of Florida in 2016. Besides her academic studies during Master's and Ph.D. years, she worked in several industry projects consisting of applications in production and logistics planning and scheduling. In those projects, she contributed as consultant, project manager, and R&D software product developer. Her main research focus lies in the field of production planning and inventory theory, and, in general, she is interested in research problems that are relevant to real-life industry practice.

Z. Caner Taşkın, Ph.D. serves currently as a Full Professor of Industrial Engineering at the Faculty of Engineering at Boğaziçi University. He received his B.S. and M.S. degrees in industrial engineering from Boğaziçi University in 2003 and 2005, respectively, and his Ph.D. degree in Industrial and Systems Engineering from the University of Florida in 2009. He has been named the recipient of the 2010 Pritsker Doctoral Dissertation Award given by the Institute of Industrial and Systems Engineers (IISE) and a 2020 recipient of BAGEP Award. His research is mainly focused on integer programming and hybrid decomposition algorithms with applications in medicine, telecommunications, graph theory and large-scale planning/scheduling. Dr. Taşkın is also involved in the design and development of ICRON Advanced Planning and Scheduling software. His work on real-world industrial applications has been selected as a finalist for EURO Excellence in Practice Award in 2015.

Cavide Tekin is a Delivery Manager in ICRON Technologies. Before joining ICRON in 2018, she served as product manager, business analyst, and project team member in various consulting firms. She holds a B.Sc. degree from Industrial Engineering Department at Middle East Technical University.