Data in Brief 13 (2017) 444–452

Contents lists available at ScienceDirect

Data in Brief

journal homepage: www.elsevier.com/locate/dib

Data Article

Datasets for supplier selection and order allocation with green criteria, all-unit quantity discounts and varying number of suppliers

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ARTICLE INFO

Article history:
Received 29 March 2017
Accepted 6 June 2017
Available online 9 June 2017

Keywords:
Green supplier selection data
Computation time data
All-unit quantity discounts
Supplier availability
Bi-objective optimization
Multi-criteria decision-making

ABSTRACT

This data article provides detailed optimization input and output datasets and optimization code for the published research work titled "Dynamic green supplier selection and order allocation with quantity discounts and varying supplier availability" (Hamdan and Cheaitou, 2017, In press) [1]. Researchers may use these datasets as a baseline for future comparison and extensive analysis of the green supplier selection and order allocation problem with all-unit quantity discount and varying number of suppliers. More particularly, the datasets presented in this article allow researchers to generate the exact optimization outputs obtained by the authors of Hamdan and Cheaitou (2017, In press) [1] using the provided optimization code and then to use them for comparison with the outputs of other techniques or methodologies such as heuristic approaches. Moreover, this article includes the randomly generated optimization input data and the related outputs that are used as input data for the statistical analysis presented in Hamdan and Cheaitou (2017 In press) [1] in which two different approaches for ranking potential suppliers are compared. This article also provides the time analysis data used in (Hamdan and Cheaitou (2017, In press) [1] to study the effect of the problem size on the compu-

DOI of original article: http://dx.doi.org/10.1016/j.cie.2017.03.028
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http://dx.doi.org/10.1016/j.dib.2017.06.018
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tation time as well as an additional time analysis dataset. The input data for the time study are generated randomly, in which the problem size is changed, and then are used by the optimization problem to obtain the corresponding optimal outputs as well as the corresponding computation time.

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Specifications Table

Subject area	*Engineering Management*
More specific subject area	*Operation research and supply chain management*
Type of data	*Tables, Figures, MATLAB data files, MATLAB codes (.m files), MS Excel file (.xlsx)*
How data was acquired	*Generated using Excel and MATLAB*
Data format	*Raw, analyzed*
Experimental factors	*Not applicable*
Experimental features	*Numerical experiments*
Data source location	*Not applicable*
Data accessibility	*Data are within this article*

Value of the data

- The datasets include input and output exact optimization data for the multi-period green supplier selection and order allocation problem with variable supplier availability and all-unit quantity discounts. This data can be used by other researchers for comparison with the heuristic solutions obtained by other methods for the same problem.
- The datasets include a computer optimization code that uses the input data in order to generate and analyze the output data. The optimization code available in the time analysis folder can also generate random input data that can be used for time analysis purposes.
- The time analysis datasets can be used by other researchers to benchmark for the purpose of developing and comparing other algorithms, such as heuristics.
- The datasets include input and output data on two supplier evaluation approaches, mainly based on AHP and fuzzy TOPSIS, which can be used by other researchers for comparison with other methods of supplier ranking.

1. Data

The datasets of this article provide additional information to [1] and contains four categories of data (datasets). The first dataset contains the optimization input and output data used in the statistical analysis in section 4.1.4 of [1] to compare between two supplier ranking approaches in a context of varying number of suppliers. The two ranking approaches can be described as follows:

Case A. ranking all the suppliers one time at the beginning of the first period, which provides preference weights valid for the entire planning horizon.

Case B. ranking in each period only the suppliers available in that period, which provides preference weights valid for that period only.

The second dataset contains the quantities ordered from each supplier in the two previously mentioned cases (Case A and Case B) in each period of the planning horizon based on the numerical

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