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Global Supplier Selection in U.S. Dollar Stores: A Learning and Adaptive Decision Support System Approach
美國一元店的全球供應商選擇：
學習性及適應性決策支援系統的方法

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August 2012
二零一二年八月

ABSTRACT

Retailers of low-priced fast moving consumer goods (FMCG) can usually make higher profit margins by purchasing low-cost imported goods from developing countries. Consequently, these retailers typically follow a strategy of sourcing their products from overseas manufacturers. Global supplier selection is a complex process. The decision making process involves multiple selection criteria, as there can be more than one reason for selecting or not selecting suppliers. These multiple criteria have not been fully, systematically, and completely identified. Buyers use a lot of time and energy in selecting suppliers because of limited decision support. Although annual sales volume could be increasing, the escalating needs for effective sourcing for lower manufactured cost and supplier selection are important initiatives in their corporate supply chain strategy.

The focus in this study was USA Dollar stores. Dollar store is a variety store retailer that sells inexpensive items, usually with a single price point for items in the store ("Variety store," n.d.). The price point of an item in dollar stores is usually only one US dollar (US$1). With the aim of staying competitive and generating acceptable profit margins, buyers of dollar stores need to source products with low procurement costs - very often from countries with inexpensive labor and other costs. The objective of this study was to develop and test a decision support system (DSS) for helping decision makers select suppliers in dollar stores. Design science research was chosen as the methodology because the practical contribution was to deliver a production system. The process included architecture design, data collection through interviews from experts, and user evaluation. To develop this decision support, the decision

process of the buyers in dollar stores was first examined and then an improvement process was designed. Subsequently, a DSS was developed and tested. This DSS provided a database and consisted of a list of attributes for buyers to choose suppliers. Business rules were created to make a trade off among attributes. The selection process allowed buyers to identify not only one supplier, but rather a group of suppliers. The decision makers or buyers could use this group of qualified suppliers and assign orders for appropriate items.

Additionally, this research creates segmentation of a product scenario based on the risk level and timing in using the product. The selection is not only for the product and suppliers. The expansion covers the product segregation in four quadrants: high risk seasonal, high risk every day, low risk seasonal and low risk every day, which could make the buying model more efficient and effective. The list of attributes and criteria were initially gathered from the literature review and validated by interviewing buyers, global sourcing experts, supply chain executives, and manufacturers. Once the DSS development was complete, interviewees were invited to perform the DSS evaluation. The development of the DSS was in iterations in order to improve the architecture.

The developed artifact is an operational system which is a learning and adaptive DSS. It provided two learning opportunities: assisted and automatic selection. It allowed buyers to choose the appropriate selection method. The development of a learning and adaptable DSS could tackle the agile global supplier selection inefficiencies. From an academic perspective, the study is an integration of supply chain activities in order to support corporate strategic development and it provides design principles for an adaptable DSS.