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Selection of an Algorithm to Operationalize Virtual Container Yards

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Abstract

This paper evaluates the factors that should be considered when introducing an algorithm to optimise virtual container yards. A virtual container yard is a modern container inventory management system which minimises empty container reposition costs incurred by container shipping lines. A combination of qualitative and quantitative approaches has been applied, and dimension reduction factor analysis was used to analyse data.

This survey was conducted in Sri Lanka. Sixteen out of the "Top 20" container shipping lines (CSL) that carry approximately 75 percent of global container capacity (alphaliner.com, 2014) are represented in Sri Lanka. Therefore, the sample is expected to be reflective of the general view of the global shipping industry. Qualitative and quantitative methods were used to collect data. The opinion survey was conducted through a questionnaire distributed to one hundred and twenty shipping companies registered under the Ceylon Association of Ships' Agents (CASA), an association comprising 135 members, and the 14-member Sri Lanka Association of Vessel Operators. According to industry experts, major decisions with respect to containers are usually taken in consultation with chief executive, operation manager, and container controller (three strata). Usually every agent has at least one employee from each stratum.

This study reveals that, in developing an algorithm for VCY, factors relevant to software requirements as well as the availability of specific hardware or operating systems required to run the software, underlying databases, and hardware platforms play important role. There is a risk in software due to problems arising from failure to consider some important aspects of the architecture necessary for successful system construction. This remains a real

concern in this software as well - especially given the complex nature of the shipping business. The consistency and coherence of the overall design, the ability of the system to undergo changes with a degree of ease, and the ability for components and subsystems to be put to suitable use in other applications and other scenarios play a major role in selection. Given trends in the container market the user needs to consider whether this product will have future utility. It is a concern whether this product will provide the flexibility to make changes the company foresees or meet different needs and working practices because the container inventory management practices vary substantially from CSL to CSL. Functionality is another key issue. The service provider needs time to outline the end user's needs and ensure all requirements are met in terms of functionality. The investment in this software or even subscription should follow thereafter. A pilot program would be ideal. User friendliness was considered a key factor in the process, and authors suggest that further research be conducted based on the identified components: namely Qualifiers, Access, Utility, and Quality using structural equation modelling with SMARTPLS; thereafter analysing the formative and reflective nature of these variables.

Keywords*: Shipping Lines, Containers, Inventory, Imbalance, Algorithm*