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Abstract
This research investigates the influence of containers to “logistics performance” and “logistics operation processes” based on a study for low-temperature distribution centers of a chain convenience store. The research is performed in three stages. At first, questionnaires are given to experts in the distribution centers for collecting main factors that are considered essential to choose containers, and for comparing the importance among these factors. Factor analysis is used to extract six major factors including “overall operation effect”, “logistics operation effect”, “quality performance effect”, “marketing purpose”, “logistics purpose”, and “production cost reduction”. Secondly, the method of Quality Function Deployment is applied to transform six factors into “ customer demands”, “design requirements”, and “capacity planning” successively to develop a type of container that fits various logistics operation processes and has optimal specification with respect to “logistics operations” and “logistics performance” under the constraint that the new containers can be incorporated with original containers and facilities.
At last, new containers are produced and embedded into the actual logistics operation processes for the distribution centers in our case study. Actual operation performance is measured and questionnaire survey is implemented to evaluate the difference of the logistics performance after the utilization of the new containers. For internal operation performance, our results show that “box capacity rate”, “manufactures shortage rate”, and “picking error rate” are significantly improved, “ reaching on time rate”, and “picking efficiency” remain unchanged, while “breakage rate” gets significantly worse. The increase of the “breakage rate” is mainly caused by the loosening of the restrictions on the minimum order quantities and has no absolute relation with the utilization of the new containers. For external operation performance, the survey indicates that the new containers not only have a better fit to the requirements of the stores than the original containers but also improve the overall performance of the service quality.
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