Application of Kernel-Based Modules on Fleet Resource Management System to Improve Service Quality for Freight Carriers with Lower Costs

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Abstract

The freight transport plays a vital role in supporting economic activities. However, freight transport currently faces many challenging problems, including traffic congestion, negative environmental impact, and high energy consumption etc. There are over 5,000 freight carriers in Taiwan, but there are only below 15%, limited on insufficient funds, can invest fleet resource management system (FRMS) to provide higher levels of service with lower costs. In Taiwan, Institute of Transportation (IOT), Ministry of Transportation and Communications has proposed a series of comprehensive plans for the development of deployment of ITS/CVO. In this paper, we propose a kernel-based concept for FRMS to improve service quality for freight carriers with lower system costs. From the system analysis, the kernel-based modules on FRMS design customized functions, including orders management, fleet operation(e.g. vehicle routing, driver scheduling), fleet resources(e.g. vehicle, driver and equipment) management, cargo tracking and dynamic navigation for different types of vehicle. We also present the development experience and the practical evaluation of the FRMS by IOT form 2007. The results of system evaluation show the system can reduce 10.95% fuel costs for the freight carrier and reduce the 10.95% CO2 emissions.

Keyword：fleet resource management system