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**Tactical Implementation Model for the
Smart Card Payment System for
Metro Operator**
智能卡收費系統於鐵路營運的
戰略實踐模式

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ABSTRACT

Smart card payment systems are becoming increasingly popular in the transport industry. More and more transport operators throughout the world are attempting to incorporate this technology to enhance and boost their businesses. However, there are still only a few successful cases. Adopting a well established smart card payment system model could help successful implementation in many cities, yet no such successful model has yet been developed for metro transport operators. The Octopus card, one of the most successful smart card payment systems, is studied and referenced in this thesis. Based on the successful experiences of Octopus, this project proposes a tactical smart card payment system implementation model to guide the successful operations of metro operators.

To develop and construct such a tactical implementation model, the project has applied a series of rigorous research methodologies, including an extensive literature review, structured interviews with experts, case studies, focus group discussions, and a survey. With reference to three benchmarked models, the “Energy System”, “Network System” and “Transit Payment Media”, the generic smart card payment system implementation model was developed, with three dimensions and eleven critical success factors defined. These dimensions and critical success factors were further cross-checked with numerous articles and found to be the common and critical features in the successful implementation of similar systems. An expert opinion survey and interviews further confirmed the validity and relevance of these dimensions and success factors, and of the proposed model. The proposed model was then benchmarked against four existing systems: ‘Yikatong’ in Beijing (BJ) Line 13, ‘Oyster Card’ in London, ‘EZ-Link’ in Singapore, and ‘Mondex’ in Hong Kong, before it was adopted for live application in Beijing Line 4.

Yikatong, in Beijing Line 4, was selected to verify and validate the proposed model. Based on the three dimensions and 11 critical success factors, the positive features of Octopus were either applied directly or modified to fit the Beijing context in the design and development of Beijing Line 4. Yikatong was successfully launched in

Beijing Line 4 in October 2009. After three months of successful live operation, a questionnaire survey was conducted to collect views from customers regarding the effectiveness of the new smart card payment system. Experts in the field were also interviewed. The new smart card payment system received very favourable feedback from Beijing customers. The experts also found the proposed model to be highly suitable and readily applicable to Beijing transport operations, regardless of the differences in demand, system complexity, and the political and geographical context in Beijing.

The thesis develops a practical, comprehensive, readily applicable and yet generic smart card payment system implementation model for transport operators. The proposed model has shown it is both practical and successful in Beijing Line 4. It also captures both fare and non-fare revenue for metro operators under prudent commercial principles. Besides improving customer service, cost and efficiency, corporate relations and marketing strategies, individual success factors in the proposed model are also shown to be effective, both for enhancing existing systems and developing new systems.

In view of the huge projected market for smart card payment systems in metro and other transport systems worldwide, particularly in China, the model is helpful for implementing smart card payment systems. Looking to the future, such a vast potential market means there is a great need for the provision of a cost effective and reliable system to cope with the increasing demand. The proposed generic model presented in this thesis will form a solid foundation on which transport operators can build successful operations.

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