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# Information technology management: the case of the Port of Singapore Authority<sup>☆</sup>

J.E. Lee-Partridge<sup>a,\*</sup>, T.S.H. Teo<sup>a</sup>, V.K.G. Lim<sup>b</sup>

<sup>a</sup>*Department of Decision Sciences, Faculty of Business Administration, National University of Singapore, 10 Kent Ridge Crescent, Singapore, Singapore 119260*

<sup>b</sup>*Department of Organisational Behaviour, Faculty of Business Administration, National University of Singapore, Singapore, Singapore*

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## Abstract

The Port of Singapore Authority (PSA) used information technology (IT) extensively to create a high-tech port that has become the busiest port in the world. Now corporatised as a commercial port operator, PSA Corporation Ltd employs four key management success factors in managing IT to meet the demands and challenges facing port operators. They are: (1) having a business-driven IT investment; (2) aligning business and IT plans; (3) maintaining a flexible and extensible IT infrastructure; and (4) encouraging IT innovation and creativity. These management success factors are discussed and examples are given to illustrate how they help PSA more effectively leverage IT to streamline operations and sustain its competitive advantage. © 2000 Elsevier Science B.V. All rights reserved.

*Keywords:* Information technology; Port operations; IT strategies; IT infrastructure; IT investment

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## 1. Introduction

The Port of Singapore is a mega transshipment hub with unparalleled cargo base load and shipping connections. Every day, the port services some 60 container vessels and moves 45,000 containers across its quay. Despite the economic crisis experienced in the region, the port was able to maintain its growth in container traffic. Over these critical years, the

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<sup>☆</sup> The Port of Singapore Authority was corporatised to be the PSA Corporation on 1 Oct 1997.

\* Corresponding author. Fax: +65-7792621.

*E-mail address:* fbaleeje@nus.edu.sg (J.E. Lee-Partridge).

Table 1

Ranking of ports on port facilities as presented in the global competitiveness report 1999 published by the world economic forum

Rank	Country	Rating for port facilities are extensive and efficient (1 strongly disagree, 7 strongly agree)
1	Singapore	6.76
2	Netherlands	6.64
3	Canada	6.42
4	Germany	6.38
5	Hong Kong SAR	6.38
6	United States	6.27
7	Finland	6.26
8	Belgium	6.17
9	Denmark	6.16
10	New Zealand	5.82

container traffic grew from 12.94 million TEUs (twenty foot equivalent units) in 1996 to 14.12 million TEUs in 1997 to 15.1 million TEUs in 1998 and 15.9 million TEUs in 1999. With the regional economic recovery, the port has already seen an increase in cargo volume. The first quarter of 2000 saw the handling of 4.2 million TEUs, a 15.4% increase compared to the same period in 1999. The port also set a world record in handling 1.5 million TEUs in a single month in March 2000; no other container terminal operator has handled such a high volume in a single location within a single month anywhere in the world.

PSA has six terminals to accommodate all types of vessels — container ships, break bulk carriers, cargo freighters, coasters, lighters, and ocean liners — calling in its waters. The six terminals are Tanjong Pagar Terminal, Keppel Terminal, Brani Terminal, Pasir Panjang Terminal, Pasir Panjang Wharves and Sembawang Wharves. The terminals are purpose-built facilities for container vessels while the wharves are multi-purpose facilities for all kinds of vessels. The management of the terminals and wharves lies in the hands of PSA Corp's Container Terminals Division and the Logistics Division, respectively. The Maritime and Port Authority (MPA), formed out of the old Port of Singapore Authority (PSA) and several departments of the then Ministry of Communications, is the landlord and port regulator.

Maritime trade is becoming an increasingly important part of Southeast Asia's economic development. Countries in the region like Malaysia, Indonesia and Hong Kong are making efforts to improve their port services and to challenge Singapore's position as a dominant shipping hub. Despite the competition, the Port of Singapore continues to outshine its neighbouring ports. In the Global Competitiveness Report 1999 published by the World Economic Forum, the Singapore port achieved a high score of 6.76 out of a possible 7 in terms of how well the port facilities met business requirements as compared to a 6.38 given to the Hong Kong SAR port (see Table 1 for a ranking of ports as provided by the report). In 1999, PSA Corp was awarded the "Best Container Terminal" by the Lloyd's List Maritime Asia. In March 2000, at the 14th Asian

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