

# Terminal productivity: optimisation, automation and high level technologies

Terminal productivity is one of the main conference themes of TOC Asia 2008. In an exclusive preview, PTI offers a sneak peak at one of the presentations.

## Competitiveness of container handling technologies and influences of application conditions

By: **Dr. Jürgen W. Böse**, HPC Hamburg Port Consulting GmbH

The remarkable worldwide growth of container volumes in recent years and the increasing competition particularly between container terminals settled comparatively close to each other has led to drastic changes in terminal capacity requirements and also economic viability of terminal operations processes.

Availability of space in ports is at a premium and often leads to bottlenecks, as does the operational optimising potential of currently installed container handling systems, whose underlying handling techniques are frequently exhausted. Therefore, terminal operators are now being forced to think about new operations technologies or technology combinations respectively, mapping their demands in a better way, and capably coping with changing requirements of dynamic transport markets.

A focus on the capacity and economic effects of technology use at container terminals, technique components realising yard in-/outflows (horizontal transport), as well as container stacking within this area (vertical transport), have to be granted an extraordinary position. One main reason why related handling equipment bears so much significance on terminal efficiency is, for example, due to the function of yard areas as a container terminal's central storage zone, buffering and linking all inbound and outbound operations processes. Obstructions or bottlenecks in the yard may directly induce negative effects on other terminal areas (such as waterside handling activities) with noticeable consequences for the terminal's competitiveness in total. Another meaningful reason is due to the heterogeneity of (yard) equipment available for horizontal and vertical transport in container terminals. This especially relates to aspects of technique and expenditure or cost, respectively.

With regard to the equipment market, and in particular to equipment pieces realising primarily horizontal container transfers, nowadays manufacturers generally provide the following equipment types: *Tractor-Trailer-Units* (TTU), *Straddle Carriers* (SC) and *Automated Guided Vehicles* (AGV). Furthermore, considering the stacking function as a matter of priority, today subsequent equipment types may be regarded as common technical system components including: *Rubber-Tyred-Gantry-Cranes* (RTG), *(Automated) Rail-Mounted-Gantry-Cranes* (RMG), *Straddle Carriers* and *Reach Stackers* (RS). It should be noted that Straddle Carriers serve both as horizontal transport and as a stacking device.

Due to the aforementioned reasons, the necessity to make procurement decisions arises not only in regards to the number, but also to the type of equipment. This is especially relevant if the resulting economic terminal efficiency (usually indicated by cost per box) and the terminal capacity (usually indicated by the max. waterside container throughput) determine such decision processes as central indicators and evaluation criteria for the competitiveness of container terminals.

## Internal and external influence factors

Operation costs from handling activities in different terminal areas are influenced by a multitude of factors, distinguished between internal and external influence factors. The former is influenced by terminal operators, and is comprised mainly through the organisation and control of handling equipment, which also immediately affects operations performance. In contrary to this, characteristics of the external factors are given and can be only influenced on-site to a certain degree. Typical examples of related factors include: the existing application conditions (such as energy and labour cost or the inflation rate), specific attributes of handling technologies (e.g. stacking height or available handling functions, i.e. horizontal versus vertical transport options) as well as the size of container terminals, most notably the length of quay walls and the extension of yard areas.

In respect to the kind of cost influences by the factors mentioned previously, the following general statement may be made: External factors fix the level of economic efficiency of container handling technologies in a long-term view (basic level), assuming common characteristics for internal factors, i.e. standard concepts and rules of organisation. Furthermore, internal factors (being adaptable by parties involved in logistics processes) determine the optimisation potential or enable exhaustion of this potential respectively through (more) intelligent deployment of available terminal resources at short notice.

Figure 1 describes the aforementioned interdependencies, taking into consideration two fictive terminal operation scenarios (each based on specific characteristics of external factors) with three handling technologies applied to these scenarios through the use of certain organisational approaches. Instead of just single technologies, technology combinations can also be considered for investigation.

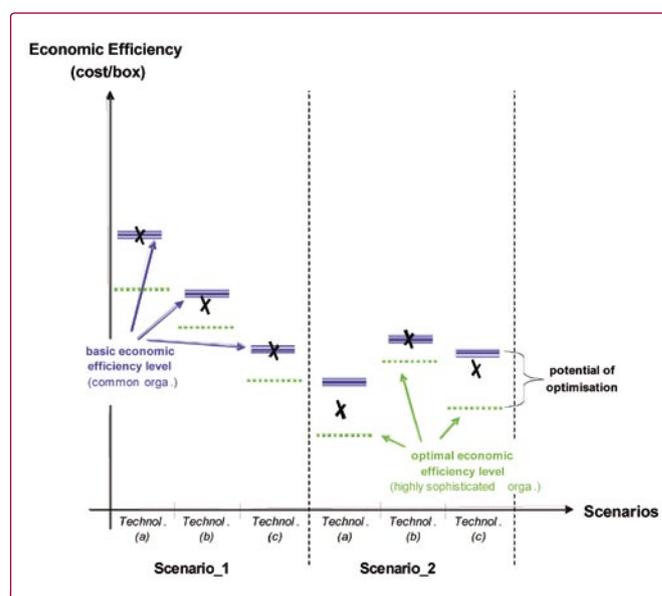


Figure 1. Technology related cost effects considering various operations scenarios.



TOC Asia 2008 will provide delegates from all sectors of the industry – whether they represent carriers, ports and terminals or equipment specialists – with a comprehensive insight into the trends, challenges and emerging technologies crucial to their business.

### TOC Asia 2008

During the presentation at TOC Asia 2008, six scenarios will be taken into consideration:

- **Scenario 1 a/b:** Industrial Countries – large/small terminals
- **Scenario 2 a/b:** Countries at the stage of economic take-off – large/small terminals
- **Scenario 3 a/b:** Developing Countries – large/small terminals

These scenarios form the basis for investigation of handling technologies primarily deployed in container terminal yards and watersides. The following technology combinations will be examined for each scenario: 'pure SC', 'RMG + AGV', 'RMG + SC', 'RTG + TTU'.

The presentation will deliver two main results which will be discussed in full at the upcoming TOC Asia 2008 conference in Shanghai. The presentation will close with HPC Hamburg Consulting's recommended list of technology combinations for each operations scenario, underlying primarily cost per box as the ranking criteria, but also taking into consideration waterside container throughput enabled through each particular combination.

### Top names lined up for TOC Asia 2008 in Shanghai

The TOC Asia Conference will address the critical issues facing today's maritime port and terminal industries and their users.

The three-day programme has been structured to offer a comprehensive overview of the dramatic changes sweeping through Asia's port and shipping landscape and to look at how terminal operators can meet the challenges of the future.

The opening Plenary conference session features key industry players, such as Dr Fu Yuning, Chairman and Managing Director of China Merchants Holdings (International), and Kuah Boon Wee, CEO, South East Asia & Singapore Terminals, PSA International Pte Ltd, who will address the future for Asia's terminal operators.

Also on the programme is Dr Geraldine Knatz, Executive Director, Port of Los Angeles, to give a US perspective on the booming transpacific trades and the impact on US West Coast ports. TOC Asia also brings together representatives from both the Panama and Suez Canal Authorities. Delegates will be able to discuss at first hand the development plans for these critical arteries of world trade.

### The Challenges of Scale – Coping with Cascading Growth

The principal theme for this year's conference is 'The Challenges of Scale – Coping with Cascading Growth'. Shipping industry news is dominated by orders for Ultra Large Container Vessels of 8,000 TEU upwards. However, it also needs to be recognised that as a result existing large panamax and even post-panamax vessels are now being deployed on intra-regional routes, putting additional strain on ports that were not designed to cope with such volumes. This 'Cascade Effect' has serious management and technical implications for all ports: regional hubs, medium sized feeder ports, smaller gateways.

To address this issue the conference features contributions from Kim Gadegaard, Vice President, Greater China Area, APM Terminals; Larry Lam, Managing Director, Portek International Ltd; and SN Srikanth, Partner, Hayers Associates.

Given the location in Shanghai, the conference will also carry significant focus on developments in China's maritime industry. How much more port expansion is to come, and, crucially, what is investment in hinterland connections keeping up?

### 100 per cent scanning

The new impetus behind global maritime security, including an assessment of the impact of '100 per cent scanning', is a highlight of day two. Richard DiNucci, Acting Director, Secure Freight Initiative Office, US Customs & Border Protection has agreed to join the programme to give delegates an update on one of the most crucial (and controversial) policy initiatives in today's maritime environment.

Advances in technology and automation, the crucial importance of establishing robust logistics partnerships, and critical issues in human resource management are key industry drivers also reflected in the agenda for this 12th TOC Asia conference.

What will be the future roles of automation and intelligent port systems? Presentations from terminal consultants and technology providers will take a look at tomorrow's maritime terminals, creating the next generation of high-performing facilities, and delegates will benefit from up to the minute briefings on advances in container crane design to meet new performance challenges.

And of concern for today's terminal operators different approaches to automated handling systems will be weighed against each other in the light of the numerous factors that have been considered before investing substantial sums in the latest technology.

The business stream takes a sweep across the rest of Asia to look at major management issues impacting terminal operations; is privatisation the answer to improved terminal performance can the same results be achieved without the intervention of private capital?

At the end of Day Two, delegates will come together again to review growing concerns about the environmental impact of port operations; with several presentations on management and technology solutions to reduce emissions from the maritime terminal.

#### Interactive workshop

Day Three features an interactive workshop on the emerging discipline of port and terminal metrics. Led by Christopher Blackstone, Consulting Editor, Cargo Systems and Kieran Ring, Chief Executive Officer, Global Institute of Logistics, delegates will learn how they can benchmark their performance against developing common standards.



Testament to the calibre of the programme put together by the TOC Asia 2008 steering committee is the quality of the speaker names we have been able to attract. Delegates will enjoy three days of pure knowledge gathering, combined with the chance to benchmark their experiences against their industry peers and take advantage of unrivalled networking opportunities.

#### ENQUIRIES

Hamburg Port Consulting's Dr Juergen Boese will be speaking at TOC Asia 2008, which is taking place in Shanghai, 18-20 March. To view the full programme and speaker list, visit [www.toc-events.com](http://www.toc-events.com)

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