MSc International Maritime Studies
- Shipping and Logistics

CHANGES IN THE UK CONTAINER TERMINAL MARKET - HOW WILL DP WORLD SOUTHAMPTON RESPOND TO THE CHALLENGES?

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2011

This dissertation is submitted in part fulfillment of the Degree of Master of Science in International Maritime Studies – Shipping and Logistics at Southampton Solent University in September 2011
Declaration

I hereby declare that the work reported in this dissertation is completely my own work unless otherwise stated, and that it has not been submitted previously for any award or degree at any other Institute.

(Signature of the candidate)

09.03.2011

(Date)
Changes in the UK container terminal market – How will DP World Southampton respond to the challenges?

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Abstract

The present study examine the recent changes that has occurred in UK container ports and terminals market as well as some key transformations in port and terminal industry. The aim of the study is to investigate the current challenges for DPWS and to analyse what strategic solutions the terminal has developed in order to respond to the challenges. Accordingly, a case study approach has been adopted by the researcher. Primary and secondary data have been collected and analysed for the purpose of this investigation. Secondary information has been extracted from different literature resources and statistics and it is used to demonstrate the major changes in the terminal industry. Primary data has been gathered by means of interviews with experts from different companies and with various experiences. This information is used to investigate DPWS challenges but also to evaluate terminals adopted strategic solutions. The analysis of the collected data reveals that DPWS has developed appropriate and workable solutions in accordance with the challenges the terminal is facing. Furthermore, the findings of the research show some areas for improvement for which recommendations have been generated.
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<tr>
<td>ABP Southampton</td>
<td>Association of British Ports</td>
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<td>APM</td>
<td>AP Moller-Maersk</td>
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<td>B2B</td>
<td>Business to Business</td>
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<td>COGSA</td>
<td>Carriage of Goods by Sea Act</td>
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<td>DPWS</td>
<td>DP World Southampton</td>
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<td>EDI</td>
<td>Electronic data Interchange</td>
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<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>European Impact Assessment Directive</td>
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<td>EPR</td>
<td>Enterprise Resource Planning</td>
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<td>High Cube Container</td>
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<td>HPH</td>
<td>Hutchison Port Holdings</td>
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<td>ICS</td>
<td>Information and Communication Systems</td>
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<td>ICT</td>
<td>Information and Communication Technology</td>
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<td>MSO</td>
<td>Multimodal Systems and Operation</td>
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<td>PCL</td>
<td>Port Centric Logistics</td>
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<td>PEMA</td>
<td>Port Equipment Manufacturers Association</td>
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<td>PESTLE</td>
<td>Political Economic Social Technological Legal Environmental</td>
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<td>PSA</td>
<td>Port Authority of Singapore</td>
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<td>SAC</td>
<td>Special Areas of Conservation</td>
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<td>Supply Chain Integration Practices</td>
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<td>SCM</td>
<td>Supply Chain Management</td>
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<td>SDR</td>
<td>Special Drawing Rights</td>
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<td>SPA</td>
<td>Special Protection areas</td>
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<td>Short Sea Shipping</td>
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<td>TESCI</td>
<td>Terminal Supply Chain Integration</td>
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<td>TEU</td>
<td>Twenty-Foot Equivalent Unit</td>
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<td>TOS</td>
<td>Terminal Operating Systems</td>
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<td>UK</td>
<td>United Kingdom</td>
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<td>ULCV</td>
<td>Ultra large container vessel</td>
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<td>VAS</td>
<td>Value-Added Services</td>
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1 SECTION 1- Introduction

1.1 Background

Major changes have occurred in the market environment in which UK container ports and terminals operate. Some of these transformations have been contributed to the UK government in terms of regulations and legislation reforms, whereas others have been related to: the role of the recent economic recession; varying UK customer demands; outsourcing of UK production; and environmental concerns.

On the other hand, UK container handling ports also operate in a global industry, which is affected by key changes in maritime and port sector. Since outsourcing of production to low-cost manufacturing markets became major business strategy for global corporations, the size of container ships has been growing. This trend described as ‘gigantism’ changed the whole terminal industry and hub and spoke networks have been developed. Moreover, the increased vessel size has boosted the containers volumes per vessel call and the issue of terminal efficiency has emerged. Some shipping companies sought vertical integration in order to ensure effectiveness of terminal operations. While on the other hand, successful port authorities have grown to global port operators in order to grow and provide their efficient service worldwide. Furthermore, the changing customer demands have transformed the traditional port-to-port transportation into door-to-door. Container terminals have become part of global supply chains hence of global supply chain competition. Accordingly sophisticated information and communication systems, value-added activities, and well-developed multimodal connections have become necessary requirement for the successful container handling ports integration in the supply chain.

Therefore, to remain sustainable and competitive in the market, terminals must be prepared to adopt appropriate and workable strategic solution in order to cope with the challenges of the changing environment.
1.2 Rationale

The topic related to the changes in the global terminal market environment and future challenges has been discussed in details theoretically by various researches. However, none of the studies has focused on particular market or port. Furthermore, practically most of the research work is based on indentifying and explaining rather than giving solutions for the discussed issues. Even if a model is generated, it is broadly defined and gives recommendations which are not valid to every port or terminal.

This study will attempt to analyse how DPWS respond to the changes in the UK market and the global trends in maritime and port industry. As a container handling port DPWS has significant problems with expansion, either physically or due to environmental reasons such as the need to dredge and take over sensitive land. Therefore, under these circumstances, DPWS have to meet the challenges within the limit of its own resources. Furthermore, the terminal needs to develop workable strategic solutions in order to remain sustainable and competitive in the UK market hence to secure its profitability and growth.

Firstly, the investigation aim and objectives; and methodology, used to collect and analyse data are presented in this section below. Secondly, a literature review of existing literature regarding the research topic is carried out in Section 2. Section 3 presents the macro-environmental analysis of the UK terminal marketplace – PESTLE model is used for the analysis of secondary data. After that, investigation of the changes in maritime and port trends sector is conducted in section 4. Next, based on the findings of the secondary research and the analysis primary data, the current challenges for DPWS are determined in section 5. Section 6 present the analysis of the primary data collected by interviews regarding the study and evaluation of the current strategic solution adopted by DPWS. And finally, conclusions and recommendations based on the findings of the research are developed in Section 7.

1.3 Aim and objectives

1.3.1 Aim

The aim of the current research is to investigate the current global and UK market challenges faced by DP World Southampton and to analyse company’s adopted strategic solutions.
1.3.2 Objectives

Study Objectives:

1. To study the current changes in UK ports and terminals market environment
2. To investigate the global changes in maritime and port sector
3. To identify the current market challenges for DPWS.
4. To analyse the adopted strategic solutions of DPWS.

1.4 Methodology

The process of obtaining, analysing and understanding information in order to find a solution for an issue is defined as a research. However, to be recognised as an academic research the above mentioned process must be controlled, precise, systematic, applicable, experimental and critical (Dawson et al., 2002). The research methodology represents the theory how the research process should be organised (Saunders et al., 2007, p.3)

1.4.1 Research approach

There are two main research approaches - deductive and inductive. The first one involves the development of a hypothesis and the establishment of a research strategy designed to examine it. With induction, first information is gathered and evaluated and then the theory is developed. The latter is less structured than the deductive approach and gives the researcher freedom to use different methods to collect data. As a result, more diverse views of the research problem are established (Saunders et al., 2007, p.117-118)

In this study, there is no hypothesis to be examined and the research is not of scientific nature. Therefore, for the purpose of this study an inductive approach has been implemented. Moreover, this research approach has been chosen because of the method of the study, which is qualitative. In every qualitative research or study, the theoretical understandings are only developed when the data has been collected (Neill, 2007). The inductive approach gives or sets a good base for this.

1.4.2 Research strategy

There is a variety of research strategies which a researcher can adopt with regards to the research approach. Saunders et al. (Saunders et al., 2007, p.135) separates the research strategies into seven different categories: experiment, survey, case study, action research, grounded theory, ethnography and archival research.
Although the research begins with business and market research, the dissertation analyses specific terminal’s solutions related to the challenges identified by the market survey. Therefore, in this study, the case study strategy has been chosen.

1.4.3 Research methods

There are two approaches for data collection: quantitative and qualitative. The quantitative method analyses numerical data while the qualitative method involves analysis of words, objects and pictures (Neill, 2007).

For this purpose of this research qualitative method has been adopted. Semi-structured interviews have been used to gather information because the study requires professional evaluation of specific facts. Thus interviews with industry experts have been used for the collection of explanatory and descriptive data.

1.4.4 Data collection

Primary and secondary information has been collected for the purposes of the research.

The secondary data has been gathered from written materials, both published and unpublished. A detailed literature review has been done on these materials which helped building better understanding of the market changes and current industry trends. The secondary data is of both qualitative and quantitative type. The sources that have made up the secondary data come from the following: books from Mountbatten library; different port and terminal journal articles, conference papers, case studies, port development and container logistics magazines (Port technology International; Containerisation International); presentations of industry experts; port websites; Internet web sites providing academic materials such as Google Scholar, Pro Quest, ABI inform, Science Direct. The limitations of using the above mentioned sources are that, they might be potentially weak with respect to consistency, incomplete or inaccurate, selective and patchy in quality.

The primary data has been collected through semi-structured interviews. The purpose of undertaking an interview has been to seek an informed expert opinion relevant to the research aim and objectives. Due to the limited period with which this research has been done, a judgemental sampling has been used to select personnel for interview. The sample frame will represent a middle level manager involved with management at DPWS but also interviews with representatives from logistics and shipping companies, which are currently clients of the terminal. Also, both informant and respondent approach have been used. Thus, first type of
The interview has assisted the researcher to collect information about the management of the terminal and the specific of performed operations. The responded approach has been applied in the second stage of the research when data regarding the evaluation of DPWS strategic solution have been needed. To encourage responses semi-structured interviews have been undertaken. The interviews are applied in Annex 1.

The limitations related to the use of the above described approach for primary data collection was the fact that most of the industry experts have been too occupied to answer questions.

1.4.5 Data analysis

This research will use both quantitative and qualitative data. However, during the process of data analysis the quantitative data has been transformed into qualitative. The qualitative data has been analysed in relation to the specific research questions by different PESTLE analysis. Also, different models for analysis of the total data set in order to evaluate strategic solution and derive conclusions were applied. (SWOT analysis; Sanches and Tuchen model for port development)

1.4.6 Limitations

Some difficulties have been encountered in this research. The most prominent among these has been the time factor. The limited period with which the study was undertaken could not allow an in-depth analysis of some issues. This also contributed to the limited number of investigations and methods used. This therefore limits the number of criteria that could be adopted to assess the strategic resolution of DPWS.

Also, meeting experts from the industry in the current market recession has proved to be a difficult task. Most of the managers identified the lack of free time and huge amount of work as a major obstacle to take participation in the research. Furthermore, although the researcher had received positive response from some stakeholders, the meetings were cancelled at the last moment.

Most importantly, the fact that DPWS has a strict policy when it comes to releasing information has been a major restriction for the research. According to company's Senior Account Manager, only he is appointed to communicate with academic researcher with regards to their questions. Thus, the researcher has not been able to meet other representatives from the planning or marketing departments of DPWS.
2 SECTIOm 2 - Literature review

2.1 Macro-environmental analysis of the UK container ports and terminals market

The macro-environmental analysis of the UK container ports and terminals market requires the use of relevant source of data, both qualitative and quantitative.

2.1.1 Political factors

Modern port policy (Department of transport, 2011) and the Master plan for Southampton port development (ABP, 2008) have been examined to identify the current political changes in the UK legislation regarding container ports development and operation. The 2007, MDS Transmodal port demand forecast (2007) has also been analysed since it is closely related to the year 2007 Government policy of port expansion and growth.

2.1.2 Economic factors

Notteboom and Winkelmans (2001) identify some major changes in port and terminal marketplace. Although, the study is out-of-date it identifies two important economic factors: the structural change from Fordism to Post Fordism; and the globalisation of trade and outsourcing of production. In support, Beddow (2011a) recognises the important role of China effect on the UK economy and demand for imported containerised. The data is supported by MDS transmodal 2012 port demand forecast (2011). In addition, the world economic growth and financial stability are closely related to demand for containerised transport. Hegen (2011), Portter (2010) and Van Marle (2011a) analyse the effect of economic recession on UK container port and terminal market.

2.1.3 Social factors

Notteboom and Winkelmans (2001) determine the changing customer demands related to Post-Fordism and the effect of that transformation on speed and reliability of transport service. In addition, Panayides (2006) and Frankel (1999) analyse the customer requirements for door-to-door transportation. The study concludes that being part of global supply chains terminal feels more pressure to speed up their operations
and to perform highly efficient service. Porter (2011), examines the growth of population as an important factor affecting demand for containerised goods, respectively demand for containerised service. To apply this model to the UK market, quantitative data from UK Office for national statistics (Office for national statistics, 2011) has been used for the current UK population trends to be analysed. However, the forecast is based on the statistical data that may change because of population trends such as: future fertility, life expectancy and migration. Furthermore, logistics security is identified by Rijsenbrij (2008) and Lun (2010) as a social factor that attracted a lot of attention to terminal operations. Both studies analyse the effect of container scanning and inspection on the terminal operations.

2.1.4 Technological factors

The technological advances have changed dramatically the port and terminal marketplace. Notteboom and Winkelmans (2001) and Rijsenbrij (Rijsenbrij, 2008) recognise the importance of technical innovation in terminal equipment for cost reduction and differentiation. Also, many researchers (Bichou, 2009; Lun, 2009; Panayides and Song, 2008; Paixao and Marlow 2003) analyse the significant role of IT for supply chain integration of ports and terminals and for the achievement of supply chain integration.

2.1.5 Environmental factors

Rijsenbrij (2008) acknowledges the key role of environmental factors on the terminal operation, development and expansion. Hane (2007) examines the legal factors affecting SCT terminal development. The study identifies all legal documents affecting terminal development in the UK.

2.2 Changes in maritime sector

2.2.1 Increased size of container vessels

Mangan et al (2008), RijsenBrij (2008) and Gkonis and Psaraftis (2009) determine increased vessel size as a major industry change that has significant effect on terminal operations and development. All of the studies analyse the terminal issues related to the accommodation of big industry vessels. However, all of the researchers use Emma
Maersk as the biggest vessel in the industry and fail to address the current size. Nevertheless, Fossey (2011b) examines Maersk Triple E-class, which is currently in order and defines that vessel size again would cause problems with berthing and operation. Notteboom and Winkelmans (2001) also investigate the importance of vessel accommodation for terminal development as a hub rather than part of the spoke network of container transportation.

2.2.2 Changes in vessels' speed

Gkonis and Psaraftis (2009) analyse the impact of 'slow steaming' on shipping and terminal operations and explain the benefits related to it. On the contrary, Johnson (2010) investigates the drawbacks associated with this strategy and the challenges it creates for terminal and shippers. In his study Beddow (2011b) also analyses the cruising the speeds of the biggest vessels in the industry and prove that 'slow steaming' has become widely adopted strategy.

2.3 Changes in port sector

2.3.1 Changes in port ownership

Notteboom (2007) and Cariou (2001) identify deregulation (privatisation and concession) of the port industry as a major government strategy to allow the vertical integration and to stimulate port operational efficiency. However, Tongzon and Heng (2005) and Baird and Valentine (2007) suggest that the process of deregulation should be carefully accessed with regards to degree of privatisation. Baird and Valentine (2007) strongly criticised the UK privatisation model and broadly identify the new challenges it present to the market related to the lack of regulatory control.

2.3.2 Emerging of global port operators

Mangan et al (2008) examines the role of GPOs and the effect on the market of terminal service. The study identified some benefits related to efficiency, cost and speed of operations. On the contrary, the study identifies as a drawback to the industry the concentration of power in the four biggest operators Hutchison ports, APM terminals, PSA and DP World. In addition, Notteboom and Winkelmans (2001) and Lun (2010) also analyse the horizontal integration in the port sector and the fierce
rivalry between the four biggest market players. Lun (2010) also analyse the vertical integration of shipping companies in the terminal sector and the effects on terminal completion related to it.

2.3.3 Integration of container terminals in the supply chain

Different studies analyse the importance of integration of container ports in the supply chain. Panayides and Song (2008) generate a four-variable model for terminal supply chain integration. The study develops measures from the standpoint of container port and therefore it could be applied to the current research. Carbone and De Martino (2003) conduct a case study and revealed that the presence of information and communication technologies (ICS) has been vital parameter for facilitating the supply chain integration process in the port of Le Havre. Paixao and Marlow (2003) analyse the role of ICS and its contribution to port dynamic and agility. Their study prove that introduction of ICS influences greater integration, avoids duplication of documentation, improves operation and data processing to all participant in the transport chain with a significant reduction of total port costs. Robinson (2002) evaluates the role of ports in the value-added chain systems. The study determines the complexity of container port environment and the need for ports to integrate by adding value to the supply chain, rather than performing simple stevedoring operations. In addition, Vitsounis and Pallis (2010) analyse what value terminal can add to the supply chain. Their study demonstrates that functional value is important in terms of supply chain performance, but also proves that relationship value can contribute to the development of strong business relationship. Bichou and Gray (2005) and Paixao and Marlow (2003) analyse the importance of multimodal connection for the successful vertical terminal integration. Moreover, Bichou and Gray (2005) study the significance of well-developed multimodal infrastructure for terminal competitiveness. However, Robinson (2006) conducted a study of Australian ports and argues that terminal multimodal links development should not be ‘copied’ from other container ports because of major inefficiencies may occur.
3  SECTION 3 – Macro-environmental analysis of UK container ports and terminals marketplace

This section will analyse the overall market environment in which DPWS operates. For that purpose a PESTLE analysis will be used. PESTLE is an acronym for Political Economical Social/Cultural Technological Legal and Environmental factors which are used for a macro-environmental analysis.

3.1  Political factors

During the last two decades world trade continues to shift global markets and production lines creating new demands on transport systems and, on ports in particular. According to Department of transport, UK economy depends on international trade and relies on fast, easy, cost-effective, and safe movement of people and goods. Consequently, the UK ports are seen by the UK government as vital network system that supports competitiveness of national and regional economies. Moreover, UK national interest dictates that ports must be able to meet efficiently and sustainably the current UK trade and its potential development. However, the UK government admits that an integrated transport policy has been neglected in the last twenty years, and the role of ports in such a strategy has not been adequately considered. Because of the sluggish development of UK port infrastructure most of the containerised cargo volumes destined for the UK market were first delivered to major European hubs such as Rotterdam and Antwerp, and from there transhipped to the UK. As a result, the competitiveness of the major UK ports was considerably decreased (Department of transport, 2011).

To respond to this fundamental challenge the UK administration established new transport policy which included several important objectives:

• To de-regulate the port industry, with the aim to stimulate it by exposure to market forces. In other words to make regulation add value rather than unnecessary costs, ensuring that different regulators co-ordinate their overall demands;

• To create agreed national standards and best-practice for port management and operations. However, these standards and practices should not detract from the legal responsibilities of harbour authorities and other port interests;

• To promote training and the recognition of skills for all who work in the ports industry regardless of their position (stevedores, dockers, truckers, crane men, etc.) - all levels not just those engaged by harbour authorities;

• To maintain a balanced policy on port development. Such policy that aims at making the best use of existing and former operational land and establishing highest possible
environmental standards, but also supporting sustainable projects for which there is a clear need.

To achieve those objectives, in July 2000 the Government created a ten-year “Transport 2010” plan to modernise the UK transport system. The Department of transport decided to allow the private sector to be proactive – to create projects for infrastructure development (both port and hinterland) which would be subsidised by the government and the private companies. The planned investments included spending of GBP 180 billion (Department of transport, 2011). Example of such hinterland development project was the redevelopment of Southampton-Nuneaton railway that was completed in March 2011. The project was subsidised by various government development organisations (Department of transport; South East England development association; West Midlands development association) and the private owners of Southampton port – ABP Southampton. (Expert 1, Interview 1).

In July 2007, during the process of reviewing national ports policy, the Government recommended that the major UK ports (among which the port of Southampton) must produce Master plans in order to help co-ordinate their future planning. (ABP Southampton, 2008). The same year, Department of Transport requested MDS Transmodal Ltd. to update their UK port demand forecast of 2005-2006, so that the data can be used by port and terminal operators when creating their future development plans. Still, 2007 was considered to be the year of the ‘super boom’ in the shipping industry and MDS Transmodal predicted demand growth was even higher than their previous 2005-2006 forecast (MDS Transmodal Ltd., 2007). When the Economic recession occurred in the summer of 2008, most of the Master plans for port development in the UK had already been approved by the Government and were in progress. Industry experts and terminal operators expected that the increased supply for container terminal service combined with the decreasing containerised freight levels might result in fierce market competition between the major UK container ports which could be a serious challenge in the future.

3.2 Economic and market factors

3.2.1 Structural shift from Fordism to Post Fordism

One of the basic forces that affect the market environment in which ports and terminals operate is the structural shift in global economy from Fordism to Post-Fordism. The Fordian era (named after Henry Ford) represented the concept of ‘economies of scale’ - manufacturing through standardisation and mass consumption of standard products. Though, Fordism reached its structural boundaries when productivity based on economies of scale reached its limits and
Individualism began to influence consumption patterns (Notteboom and Winkelmans, 2001). Gradually the 'old' model was replaced by a new class of economic system. This Post-Fordism concept is directed to 'economies of scope' and more flexible organisations through global partnership in the international markets. Product-life cycles and time-to-market became shorter to meet international markets demand for greater product variety. Inevitably, this new concept affected transport flows - the number of products to be shipped and the shipment frequency increase, while shipment sizes become smaller (ibid.). The container seemed to be the solution for these challenges and global manufacturers adopted container as privileged transport unit for international transportation. Time-based distribution strategies such as "just-in-time delivery" emerged and speed of terminal operations proved to be essential for their success. Fast turn-around times and quick stevedoring operations characterise terminal operations and has developed into major selecting criteria for liner shipping companies and global logistic providers (Notteboom and Rodrigue, 2010a). Then again, the growing demand for intermodal transport (Table 3.1) began to reflect onto the containerised volumes handled by global terminals. Global terminal utilisation grew rapidly between 2002 and 2008 from 72.52 per cent to 88.17 percent. The supply grew slower than demand which led to congestions in major terminals particularly in Asia and Far East. Global terminal operators realised that they need to be ‘proactive’ and to develop their operational facilities ahead of demand to prevent future congestions.

### Table 3.1 - Capacity utilisation of world ports by region (2002 - 2008)

<table>
<thead>
<tr>
<th>Region</th>
<th>2002</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>S</td>
<td>D</td>
</tr>
<tr>
<td>North America</td>
<td>47.9</td>
<td>34.2</td>
</tr>
<tr>
<td>North Europe</td>
<td>50.2</td>
<td>34.7</td>
</tr>
<tr>
<td>South Europe</td>
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<td>22.9</td>
</tr>
<tr>
<td>Far East</td>
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<td>86.6</td>
</tr>
<tr>
<td>South East Asia</td>
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<td>40.8</td>
</tr>
<tr>
<td>Middle East</td>
<td>19.3</td>
<td>13.5</td>
</tr>
<tr>
<td>Central America</td>
<td>15.2</td>
<td>10.6</td>
</tr>
<tr>
<td>South Africa</td>
<td>14.4</td>
<td>8.4</td>
</tr>
<tr>
<td>Oceania</td>
<td>9</td>
<td>5.9</td>
</tr>
<tr>
<td>South Asia</td>
<td>8.1</td>
<td>6.8</td>
</tr>
<tr>
<td>Africa</td>
<td>11.4</td>
<td>8.3</td>
</tr>
<tr>
<td>East Europe</td>
<td>3.9</td>
<td>1.7</td>
</tr>
<tr>
<td><strong>Global</strong></td>
<td>378.1</td>
<td>274.4</td>
</tr>
</tbody>
</table>

S = Supply (Capacity in TEU million)
D = Demand (Throughput in TEU million)
U = Utilization (Throughput/Capacity)

Source: UN ESCAP, 2011
3.2.2 Globalisation of trade and manufacturing outsourcing

Globalisation of trade and manufacturing outsourcing represent another significant international business trends that have profound effect on the rapid growth of container trade and the development of the major container terminals around the world (Terminalisation of the ports, 2006). The growing effectiveness of international capital markets and the liberalising influence of international organisation such as the World Trade Organisation and the European Union have stimulated the emergence of global corporations (Notteboom and Winkelmans, 2001). These international companies have recognised the advantages of production outsourcing as a way to substantially reduce their manufacturing costs as well as other investments in plants and equipment. Consequently, outsourcing grew rapidly during the 1990 and now has become accepted dimension of corporate strategy. The de-industrialisation of North America and Europe and the relocation of production to the emerging economies of Asia have resulted in an increase in containerised imports of semi-manufactured and finished goods. Since China opened to the international trading market in 2002, its impact on UK production has been remarkable. In just few years, the relocation of many UK manufacturing industries, such as clothing and textile production, has led to the UK becoming Europe’s largest importer of deep-sea containerised goods. China accounted for 37 per cent of all deep-sea imports to the UK in 2010 or just over one-in-three TEU. This growth has stimulated the two major container terminals in the UK, Felixstowe and Southampton, to push forward with their development plans to handle bigger vessels and larger TEU volumes (Beddow, 2011a). In addition, MDS Transmodal predicted that 2011 deep-sea imports into the UK would increase by 8.3 per cent to reach 2.68 million TEU (following 2010 growth of 17.9 per cent). MDS consultants also expected deep-sea export to raise by 15.7 per cent in 2011 up to 1.42 million TEU. Moreover, the 2012 MDS Transmodal forecast for the UK containerised market remains stable, despite the recent uninspiring GDP results and serious UK Government plans to cut national debt which are expected to devalue the British sterling, making overseas imports respectively expensive (Garratt, 2011). The positive forecast would have a beneficial effect on the terminal development in the UK.

3.2.3 Economic growth and financial stability

Another important economic factor that affects globally terminal development and operation is the world’s economic growth and financial stability. In recent decades global trade has grown faster than world gross domestic product (GDP) and the demand for intermodal service has developed at bigger rates than the world trade (Figure 3.1).
Global Container Traffic has historically grown at 3-4x World GDP Growth

As it is seen from the graph, the container traffic has become highly volatile and the effect of major economic ups and downs results in high fluctuations in the intermodal trade hence affecting the demand for terminal service. According to 2010 Drewry Annual Review of Global Container Terminal Operators, in 2009 the world's average terminal utilisation was 63 per cent and a total of 473 million TEU were handled globally. The positive industry forecast for 2009-2015 showed expected growth in container volumes by 7.2 per cent annually while terminal capacity would increase only by 3 per cent. Respectively, the world's average utilisation rates are expected to reach 80 per cent by 2015. Drewry shipping consultants suggested that this fact might not present such a problem to the industry as a whole but terminals in prime locations could feel the heat of congestion unless expansion is stepped up significantly (Drewry shipping consultants, 2010).

On the contrary, the economic recession has meant widespread retrenchments in terminal expansion and investment. Development projects have been slowed or delayed. In the UK Bristol and Liverpool are waiting for the economic tide to turn and their risk-averse investors have postponed the development projects because of the slow recovery of the UK economy. (Porter, 2011). Although container lines recovered from the massive losses incurred in 2009 and in the end of 2010 the market figures showed better terminal utilisation, the first half of 2011 indicated poor financial result for most of the enterprises in the container business (Hagen, 2011). Moreover, the problems with the US debt; the ongoing peripheral crisis in the EU related to the Greek debt crisis and the readjustment of the fiscal policies of Spain, Italy, Ireland and Portugal; the recent collapse of the stock markets all over the world are seen by many experts as a sign of the second wave of recession. After a short recovery, now many industry experts expect that global markets will face another depression. The leading port
analyst Ben Hackett has claimed that Europe’s ports could be pushed into a new predicament as throughput at Northern ports continues to slide and major slowdown is seen in the Asian exports. (Van Marle, 2011a). As far as terminal development is concerned, Drewry shipping consultants expect a quick market recovery from the second recession. They fear that if some of the previously planned expansions are not revived within the next three to five years, major congestion may recur particularly at key terminals.

3.3 Social and cultural factors

3.3.1 Changing customers’ demand practices

As it was previously discussed Port-Fordism is associated with broader social and cultural changes. Consumers require a greater variety of products and impose higher requirement as far as availability, quality and reliability of customer commodities are concerned (Notteboom and Winkelmans, 2001). The door-to-door concept has become tremendously important in the transportation of containerised goods. Traditional customers of maritime transport have altered their focus to receiving a complete door-to-door service (Panayides, 2006). Frankel (Frankel, 1999, p.10) notes that the times when shippers used a wide range of freight forwarders, shipping companies, clearance agents, truckers, railway services, etc. and also an array of financial, insurance and other institutions are gone. Present customers demand and receive "...integrated just-in-time and efficient all-inclusive door-to-door service at a predetermined price". In this respect, inland distribution has become a vital dimension in the development of global supply chains. Thus, hinterland connections and other logistics functions and characteristics have gained prominence in the achievement of superior port performance and competitiveness (Panayides, 2006).

3.3.2 Population trends

Statistics suggests that the earth’s population has vastly grown from five to six billion for a period of only twelve years (1977-1989) and the increasing trend has continued since then to reach seven billion people in the end of 2011. In fact, that is the shortest period of time ever taken for the population to rise by a two billion people. Moreover, experts forecast that in forty years global population is going to reach nine billion people (Parker, 2011). Globalisation of trade and the growth of world’s population affected positively the consumption of lots of commodities transported in containers. The low manufacturing cost due to outsourcing and the cost-effective global transportation broadened the range of customers receiving shipments of goods conveyed with containers hence resulting in an increased demand for container terminal
service. The UK population trends do not differ significantly from the rest of the world. According to Office for national statistics forecast (Figure 3.3), in the next twenty years (from 2013 to 2033) UK population will grow by ten million (Office for national statistics, 2011). Additionally, the country has shifted from a manufacturing and materials production based-economy to a service economy with a high degree of imports. The combination of these facts will prove to be a huge boost for the UK intermodal imports. It will create further demand for terminal service in the UK and put additional pressure on terminal development in terms of capacity and speed of operations. As the chart in Figure 3.2 suggests, the expected population growth in England will have the highest influence on the overall growth of population in the UK. Moreover, according to the former international supply chain manager of Marks and Spencer, Southern England accounts for 55 per cent of all consumption of containerised commodities in England. This evidence creates additional challenges for container terminals operating in this region – Felixstowe, Southampton, London Thamesport and Tilbury. (This forecast is based on the Office for National Statistics’ data and other variant projections are also available, based on alternative assumptions of future fertility, life expectancy or migration.)

3.3.3 Logistics Security

Container transport has always been a target for drug smuggling, human trafficking or illegal trade. Following the events of 11 September 2001, container industry immediately attracted an unprecedented level of international attention. Containers have become devices for potential

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**Figure 3.2 Population trends in the UK and England**

![Population trends in the UK and England](image_url)

Source: Author
arms smuggling or even for delivery of chemical, biological or nuclear weapons (Donnovan and Bonney 2006, p.218). Societies (especially in Europe, the USA, Canada and Australia) are calling for more strict control over imported cargoes and all kinds of different inspections have been introduced. Some ports authorities and terminals deployed X-ray scanning and γ-ray non-intrusive container inspection to detect drugs, illegal immigrants and illegal shipments (Lun et al. 2010, p.146). Hence, terminals around the globe needed to make additional capital investments for up-to-date scanning equipment. In addition, visual inspections (to check quantities and packing; to control of due taxes) and product test (veterinary and bacteriological tests) were also introduced (Rijsenbrij, 2008). All these security activities required planning of additional transportation inside the area of the terminal thus creating more challenges for the speed of terminal intermodal operations.

3.3.4 Safety and sound working conditions

The safety and sound working conditions has become progressively more important topic for terminal operations. The growing number of containers going through terminals combined with swift stevedoring operations has increased the risk of work related accidents (Rijsenbrij, 2008). Every operational hour lost due to accident does not only decrease terminal reliability but also may seriously harm its reputation. Furthermore, the increasing amount of different chemicals and hazardous cargo transported in containers has drawn more attention from public regulatory bodies. Consequently, the UK Government has created strict national laws but also is a signatory to different conventions and international regulations which exercise control over terminal operations. In 2010, the UK container terminal operators acted proactively and with the assistance from Port Skills and Safety have created ‘Container Handling – Health and Safety in Ports Guidance’. The guidance identifies key risks related to container handling, assesses them and gives examples of the good practice (Port Skills and Safety, 2011).

3.4 Technological factors

According to Smith and Fingar (Smith and Fingar, 2003, p.74), technology is an aid to improvement and innovation of current business process in order to achieve business success, profitability and growth. Since freight rates and margins in the intermodal transport industry have decreased considerably, the objective of profit maximisation can be achieved by cost reduction through technical innovation or a differentiation of up-to-date technology (Notteboom and Winkelmans, 2001). Technology in terminals can be divided into two major groups: technological innovations in terminal equipment and information technology improvements such as: electronic data interchange (EDI) systems; terminal operating systems (TOS) and enterprise resource planning (ERP) systems (Bichou, 2009).
3.4.1 Terminal equipment development

The terminal equipment development is related to the strong technological evolution in the shipping sector. Terminal operators have always been under pressure from liner shipping companies to improve shipside performance. However, this requirement has gained even more momentum since the introduction of the post-panamax, new panamax and the ultra large container vessels (ULCV) (Wren, 2009). Still, the 84 per cent increase in vessel width far exceeds the percentage increase in vessel length - 41 per cent (Figure 3.4 and Figure 3.5).

Figure 3.3 Increased width of different vessels

![Increased width of different vessels](image1)

Figure 3.4 Increased length of different size of vessels

![Increased length of different size of vessels](image2)

Source: Author

This trend proves to be serious challenge for terminal operators because more Ship-to-Shore Cranes (STSC) have to be deployed for each container ship with regard to its length in order to facilitate swift stevedoring operations. Then again, the increased width of the vessels creates additional issues related to the operational reach of STSC (measured in containers on weather
deck). As a result, in many container terminals, throughput capacity is limited by berth capacity. In order to maintain higher berth productivity and to be able to provide efficient service to the ‘Giants’ of the industry, terminals have to invest in latest state-of-the-art technologic solutions that address the abovementioned challenges (Wren, 2009). Manufacturers’ resolutions include bigger STSC with the longest possible operational reach and powerful enough to perform tandem lift operations (lifting of two 40-foot or four 20-foot containers for each crane cycle). However, these solutions provide other challenges for the horizontal transfer equipment (HTE) in a terminal and reassessment of the current transfer operations is required.

3.4.2 IT improvements

The global economy has been overwhelmingly affected by the use of information technology (IT) such as electronic and mobile commerce. Terminals have been investing in resources to develop sophisticated electronic networks to ensure time and correct flow of information, which enables faultless operations with their customers (Lun, 2009, p.27). Moreover, the sharing of information among supply chain partners is seen as a building block that characterises a solid business to business relationship (Panayides and Song, 2008). Paixao and Marlow (Paixao and Marlow, 2003) suggested that information technology and information sharing systems influence greater integration, avoiding duplication of documentation, improving operation and data processing to all participant in the transport chain with a significant reduction of total port costs. In the current fierce market competition between container terminals IT systems have become necessity rather than source of competitive advantage. Hence, to protect their market share and grow further, major terminals need to improve their Electronic Data Interchange (EDI)-based information systems, for example to provide easy web-based access for their business partners that would allow real-time tracking and tracing of shipments. Thus, planning of terminal and inland transportation operations would be further supported with more pre-information and data sharing (Rijsenbrij, 2008).

3.5 Legal factors

In September 2009, the United Nations General Assembly accepted one of the most significant legal changes affecting intermodal transportation - The Convention on Contracts for the International Carriage of Goods Wholly or Partly by Sea, otherwise known as the ‘Rotterdam rules’. The purpose of this convention was to replace the aged 1936 Carriage of Goods by Sea Act (COGSA) which cannot accordingly solve key issues related to the present age of international intermodal door-to-door container service (Interconnect, 2011). Prior to ‘Rotterdam rules’, the Convention on International Multimodal Transport of Goods 1980 and
the Convention on the liability of Operators of Transport Terminals in International Trade 1991 had not received sufficient international recognition to make a stern impact on International law and to create significant change in transport practices. Container terminals have not been subject to any obligatory international convention to limit their liability, either on the basis of Bills of lading terms or other trading conditions (ibid.). However, when ratified, Article 19 of the Convention would be applicable to any operator defined as a 'maritime performing party', which includes stevedoring companies, harbour-area truckers and most importantly container terminals. Therefore, if certain conditions are met, terminals would have the same obligations and liabilities as carriers but also be entitled to the carrier's defences. The terminal's liability under the 'Rotterdam Rules' is limited by various circumstances (Article 17(3)) or measured in terms of compensation (Article 59) - 875 Special Drawing Rights (SDRs) per package or 3 SDRs per kilogram of gross weight, whichever is greater (Rotterdam rules, 2011). The most important new feature of the Convention is the responsibility of the terminals for damage due to delay. In “just-in-time” era “on-time delivery” is a vital for customers. Consequently, besides the exclusive circumstances of Article 17(3), if proven, terminals are liable to delays caused by terminal equipment or employee in the area of their jurisdiction. Thus, terminals should make constant investments and improvements in their operations to avoid any disagreeable loss, damage or delay. Moreover, the Convention increases the period for commencement of suit proceeding from one to two years (Interconnect, 2011). Although the Convention implies more strict regulation to both responsibility and liability of the terminals, the Rotterdam Rules aim at bringing the business trust and security in the global trade.

Although the UK replies positively to the development of the Convention, the UK is not currently a signatory to the Rotterdam Rules. The country has adopted a neutral position and decision has not been reached about whether or how to adopt the new Convention. The Government realises that Common law and the Hague-Visby rules have stood the test of time and served the UK trading community well. Still, the Administration understands that the new Convention addresses adequately current and future transportation practices. The Department for Transport has made a decision to set up a stakeholder working group comprising representatives from carrier and cargo interests, legal, banking and insurance sectors, academics and other interested parties. This consultation group aims at discussing benefits and detriment of the Convention, including an impact assessment, before the UK government takes a decision on the Rotterdam Rules (SITPRO, 2010).
3.6 Environmental and energy factors

3.6.1 Growing environmental concerns

Environmental protection has usually been related to legislation changes being a sluggish reactive process for the intermodal freight industry. However, environmentally-cautious customers decided to take the matter into their own hands and required cost-effective but low-carbon transportations (Beddow, 2011a). Global logistics providers have begun to verify their carbon emissions and offering their customers more environmental-friendly intermodal transportation. One of the possible solutions was to reduce the load of road transport by shifting containers to other transportation modes. To be successful, this strategy requires container terminals to have good rail, barge or short sea shipping connections (Rijsenbrij, 2008). Also, Port Equipment Manufacturers Association (PEMA) stated that globally terminals began to assess their CO₂ emissions and to consider different strategies to reduce their carbon footprint. According to PEMA, emission reduction has become top environmental challenge for the terminal operators and for port equipment manufacturers as well (PEMA, 2010). Besides pollution emanating from land-based operation, terminals are forced to take measure to reduce marine contamination originating from container vessels visiting the ports. Since January 2011, the international standard for calculation of ships emissions, also known as Environmental Ship Index (ESI), has been officially launched. The ESI was created by two international organisations - International Association of Ports and Harbors' World Ports Climate Initiative. The ESI is published in an Internet based free of charge system, thus terminals and ports will have the option to reward environmental vessels by reducing their port and terminal charges. Ports like Antwerp, Amsterdam and Rotterdam have already introduced incentives for "greener" vessels. Potentially, the ESI could have a very large impact on the shipping industry as its 230 members will control 60 per cent of world seaborne trade and 90% of all container traffic movements (Fossey, 2011).

3.6.2 Environmental affect on terminal development and operations

Environmental issues will increasingly determine terminal development and expansion. One of the key ecological concerns remains the selection of land for growth of container terminal facilities (Rijsenbrij, 2008). An important environmental change in the UK has been the creation of special designated nature conservation areas such as: Ramsar Convention sites (Wetland areas); Special Protection Areas (SPAs) and Special Areas of Conservation (SAC) also known as ‘European sites'; and Sites of Special Scientific Interest (SSSI) (ABP Southampton, 2008). The UK and European environmental protective legislation impose firm rules on terminal expansion. The various legal documents affecting terminal development are listed in Table 3.2.
Table 3.2 Different legal documents affecting terminal development

<table>
<thead>
<tr>
<th>No</th>
<th>Title of Legislation</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The Merchant Shipping (Prevention of Oil Pollution) Act 1971</td>
<td>UK</td>
</tr>
<tr>
<td>2</td>
<td>The Merchant Shipping (Reporting of Pollution incidents) Regulations 1987</td>
<td>UK</td>
</tr>
<tr>
<td>3</td>
<td>The Merchant Shipping (Oil Pollution Preparedness, Response and Co-operation Convention) Regulation 1988</td>
<td>UK</td>
</tr>
<tr>
<td>4</td>
<td>The Merchant Shipping (Dangerous or Noxious Liquid Substances in Bulk) Regulations 1996.</td>
<td>UK</td>
</tr>
<tr>
<td>5</td>
<td>The Merchant Shipping (Port Waste Reception Facilities) Regulation 1997</td>
<td>UK</td>
</tr>
<tr>
<td>6</td>
<td>Wildlife and Countryside Act, 1981</td>
<td>UK</td>
</tr>
<tr>
<td>7</td>
<td>Food and Environmental Protection Act 1985</td>
<td>UK</td>
</tr>
<tr>
<td>8</td>
<td>Environmental Protection Act, 1990</td>
<td>UK</td>
</tr>
<tr>
<td>9</td>
<td>Water Resource Act, 1991</td>
<td>UK</td>
</tr>
<tr>
<td>10</td>
<td>Environmental Act, 1995</td>
<td>UK</td>
</tr>
<tr>
<td>11</td>
<td>Modern Ports: A UK policy</td>
<td>UK</td>
</tr>
<tr>
<td>12</td>
<td>EC Directive on the Conservation of wild Birds (the bird directive), 79/409/EEC</td>
<td>EC</td>
</tr>
<tr>
<td>13</td>
<td>EC Directive on the conservation of Natural Habitats and wild fauna and flora, (92/43/EEC)</td>
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</tr>
<tr>
<td>14</td>
<td>Environmental Impact Assessment directive (97/11/EEC)</td>
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<tr>
<td>15</td>
<td>The EU Water Framework Directive</td>
<td>EC</td>
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<td>16</td>
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<td>17</td>
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<tr>
<td>18</td>
<td>Agenda 21</td>
<td>International</td>
</tr>
</tbody>
</table>

Source: Hene, 2007

The most recent legal change is the European Union’s Environmental Impact Assessment Directive (EIAD). EIAD demands all ports/terminals receiving vessels over 1,350 tonnes to generate environmental assessment for future port development and to take into consideration all abovementioned protected areas. The information supplied in the assessment should consider significant direct and indirect effects to flora, fauna and landscape and the interrelationship of these with other aspects. The assessment should include details of measures to reduce significant adverse effects. Consequently, terminals must demonstrate a high level of environmental performance and sustainability not only to comply with existing legislation to get approval by authorities but also to retain community support and to attract potential investors (International Transport Forum, 2009).
4 SECTION 4 – Changes in maritime and terminal sector

4.1 Changes in maritime sector

As it was discussed earlier in the research, today many of world’s economies have become increasingly interrelated as a result of the growing trends towards globalisation of trade and outsourcing of production. Over the past two decades more and more counties, especially in Asia and Far East, have identified an increase in exports as a share of GDP (Mangan et al, 2008). Since more than 90 per cent of all world trade in terms of volume is transported by sea, some key maritime trends have occurred to have significant effect on terminal operations and development. These important changes include bigger, energy-efficient and faster container ships contributing to the substantial improvement of “economies of scale and scope”.

4.1.1 Increased vessel size

The trade environment in which container shipping companies operate is characterised by intense pricing pressure from shippers and logistic companies. Therefore, liner companies have always been exploring opportunities to reduce their costs in order to increase their profit (Notteboom and Winkelmans, 2001). As cargo volumes transported by means of maritime transport increased dramatically, liner business began to recognise the benefits of economies of scale to decrease fixed vessel costs (Gkonis and Psaraftis, 2009). The huge distances between the major container routes (Figure 4.1) allow container shipping companies to operate with bigger vessels which have lower cost-per slot and increased capacity compared to smaller ones (Johnson, 2008). Therefore, larger ships are also faster and capable of providing a better service and better utilisation of assets (Gkonis and Psaraftis, 2009).

As a result, container vessel size has increased dramatically in the recent years (an industry trend described by many researchers as “gigantism”). Since Maersk Line launched Emma Maersk in 2006, several liner operators such as Mediterranean Shipping Company; the French operator CMA CGM; COSCO Container lines; China Shipping Container Lines (CSCL) and United Arab Shipping Company (UASC) have swiftly followed the introduction of super-post panama vessels (10000 TEU +) in their fleet (Fossey, 2011b).
The summary of fully cellular container fleet in March 2011 (Table 4.1) supports the increasing trend in vessel size. The order book shows considerable boost in super post-panamax by 39 per cent and tremendous boost in ultra large container carriers (ULCV) by 256 per cent. In one word, the industry ‘giants’ (over 8,000 TEU) represent 21.7 per cent of existing container vessel TEU capacity and more than 68 per cent of the ordered capacity. What is more Maersk line’s latest order for a series of ten 18000TEU ships has really taken the industry by storm. The Danish carrier action clearly has set out what it views to be the ground rule for development in the liner business. Eivin Kolding, Maersk CEO, explained that Triple-E class would have vastly improved economies of scale and set new standards for the whole industry (Fossey, 2011b). Therefore, container shipping is going to maintain the application of economies of scale, resulting in bigger vessels, larger number of containers per call and enlarged peak demands (especially Christmas and Easter).
The increasing size of vessels has enormous effect on terminal expansion and operations. Considerable operational life of container cranes (25 years), terminal quay walls (50 years) and port entrances and breakwaters (100 years) demand a long-term forecast when it comes to the impact of future vessel sizes on the design of berths and provision of ship-to-shore cranes (Rijsenbrij, 2008). The physical dimensions of a deep-sea container vessel present serious challenges for existing terminals. First, they must ensure the navigation safety of these vessels which includes sufficient approaching channel depths as well as adequate depths along quayside. Also, a turning basin of 600 – 800 metres diameter is required to be easy for a vessel to manoeuvre. To the degree that berthing planning is concerned, terminals are facing other issues. The length of the berth remains the same whereas the average ship length has increased. Thus, terminals are not able to accommodate and provide service to the same amount of vessels which disturbs schedules and decreases efficiency. As it was analysed earlier in the research, vessel width is related to the total amount of containers across the weather deck. For instance, the new Maersk Triple-E class has 23 rows of containers across the open deck. Most of the existing terminals are using super-post panamax STSC with operational reach of 22 containers (Fossey, 2011b). Therefore, considerable investments in container cranes will be needed so that an existing terminal to be able to provide efficient and reliable service to these ultra-large container carriers

Moreover, over the past years, terminal throughput (measured in container or TEU moves over the quaywall) has raised from a few hundred thousand to 5 million moves per terminal at present because of the increased number of containers per call. However, when constructed the majority of terminals were sized for capacity between 0,5 and 2 million moves (RijsenBrij, 2008). This increased container throughput creates new issues for the stevedoring, stacking and logistics operations provided by ports. Accordingly, scale developments in the terminal

### Table 4.1 – Summary of fully cellular container fleet (June 2011)

<table>
<thead>
<tr>
<th></th>
<th>under 5,000TEU</th>
<th>5,000 - 7,999TEU</th>
<th>8,000 - 11,999TEU</th>
<th>12,000 - 15,500TEU</th>
<th>15,500TEU+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>In service</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEU capacity</td>
<td>8,035,573</td>
<td>3,200,141</td>
<td>2,503,503</td>
<td>611,284</td>
<td>-</td>
<td>14,350,501</td>
</tr>
<tr>
<td>Number of vessels</td>
<td>4,049</td>
<td>537</td>
<td>286</td>
<td>44</td>
<td>-</td>
<td>4,916</td>
</tr>
<tr>
<td><strong>On order</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEU capacity</td>
<td>846,208</td>
<td>376,714</td>
<td>1,005,619</td>
<td>1,472,669</td>
<td>180,000</td>
<td>3,881,210</td>
</tr>
<tr>
<td>Number of vessels</td>
<td>303</td>
<td>57</td>
<td>112</td>
<td>113</td>
<td>10</td>
<td>595</td>
</tr>
</tbody>
</table>

Source: Containerisation International, June 2011
area quickly followed the size improvements at sea. Quay walls have been strengthened to support new massive gantry cranes with load moments reaching 6000 ton-metres capable of lifting four 20-foot containers simultaneously. Also, time spend in a container port is considered to be negative return to liner companies hence they require the fastest possible operations (Gkonis and Psaraftis, 2009). Therefore, terminals need to provide effective handling capacity of 60 containers per hour which requires the latest state-of-the-art crane equipment with technical handling capacity of at least 100 containers per hour (Rijsenbrij, 2008). Due to the swiftness of stevedoring operations, the storage systems have also been improved considerably. The internal container movements include hundreds of boxes per hour which needed to be conveyed to the right place and at the right time. The effective control over these operations has put the labour organisation and management systems up to the limits of their human capabilities. For this reason, terminals began to divide into several smaller areas which can be better managed. In addition, scale developments in internal container transport have been boosted by the impressive developments in information and communication technology (ICT). Today’s availability of high-capacity computer systems which allow standardisation of EDI, effective planning and management of information software is a prerequisite for further increase in scale of container logistics (Saanen et al, 2000).

4.1.2 Big vessel accommodation - terminal selection criteria

Since only limited numbers of ports are able to handle larger vessels, the concentration of traffic at certain terminals has increased. As hub and spoke network has developed, many mid-sized terminals perform a feeder role to larger container ports. The industry ‘giants’ operate between the major transhipment hubs, that make the prosperity of the smaller terminals depend on the route strategies of the major shipping lines and logistic operators (Mangan et al, 2008). However, competition between major hubs has evolved towards competition between supply chains driven by consumers demand for low-cost, environmental friendly and just-in-time transportation. Big transhipment terminals can no longer expect to attract cargo simply because of their proximity to rich hinterlands. Today logistics operators and liner companies consider ports basically as a sub-system in the logistics chain. Accordingly, container shipping operators decide to concentrate their service packages on a particular hub not because of its sea-to-land interface but on the quality and reliability which it brings to the entire transport chain (Notteboom and Winkelmans, 2001). Any alterations in route network design by the major container shipping operators can have a profound impact on the future of big or medium sized terminals. Liner companies’ service planners compare large ports/terminals on a wide range of factors and criteria which have been identified and divided into three groups (Table 4.2):
## Table 4.2 Factor groups and criteria for terminal selection

<table>
<thead>
<tr>
<th>Factor groups</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand profile of container port</td>
<td>• flow orientation of the container port towards hinterland and foreland</td>
</tr>
<tr>
<td></td>
<td>• scale and growth of the port</td>
</tr>
<tr>
<td></td>
<td>• connectivity in maritime networks (closeness to major trading routes)</td>
</tr>
<tr>
<td>Supply profile of container port</td>
<td>• Terminal efficiency (productivity, reliability of operations, etc.)</td>
</tr>
<tr>
<td></td>
<td>• quality and reliability of nautical access</td>
</tr>
<tr>
<td></td>
<td>• competitiveness of cost levels</td>
</tr>
<tr>
<td></td>
<td>• container terminal and hinterland connections (road, rail, short sea shipping)</td>
</tr>
<tr>
<td></td>
<td>• environmental and safety record</td>
</tr>
<tr>
<td></td>
<td>• innovations (IT, TOS and ICS systems)</td>
</tr>
<tr>
<td>Market profile of container port</td>
<td>• import/export balance of the terminal</td>
</tr>
<tr>
<td></td>
<td>• cargo control characteristics (who dominates in the terminal shipping lines or freight forwarders)</td>
</tr>
<tr>
<td></td>
<td>• the structure of terminal operating business in the port</td>
</tr>
<tr>
<td></td>
<td>• logistic focus of terminal operations (the presence/absence of logistic activities)</td>
</tr>
</tbody>
</table>

Sources: Notteboom, 2010; Port technology International, 2009; Port technology International, 2010;

Even if terminals can satisfy the selection criteria, the loyalty of a terminal customer cannot be taken for granted in the current container market environment. European container ports increasingly have to deal with large port clients who possess a strong bargaining power. Consequently, big terminals face the constant risk of losing important liner customer and their dominant position as a major transhipment hubs, not because of deficiencies in infrastructure or operations, but because a customer has reorganised its service network or established a new partnership with other logistics operators (Notteboom and Winkelmans, 2001).

### 4.1.3 ‘Slow steaming’

The idea of slow steaming first made its impressions on the liner shipping industry back at the beginning of 2009, when the market slump and global economic downturn began to take effect. Linked with the increasing cost of fuel and the environmental issues of CO₂ emission reduction, lines jumped at the opportunity to cut speed, save costs and address the eco-friendly concerns of the environmental world. Since speed of operations was no longer essential factor, ‘slow steaming’ allowed container shipping to reduce one of its most substantial expenses -
According to container shipping companies, 'slow steaming' on Asia-Europe route is estimated to save US$ 10 million in fuel costs. Also on the positive side, the introduction of 'slow steaming' allowed companies to control capacity in order to prevent oversupply and port congestions, and to deploy significant part of the previously laid-up container vessels.

However, container shipping is interconnected with other participants in the global supply chain. Therefore, every change in operational strategy, such as 'slow steaming', will affect the whole supply chain and will create complications for ports and terminals. When a vessel is...
added and service rotation is slowed down, berthing windows in terminals need to be changed. Still, this is a task that is not easily addressed in Europe. It has been proven that ports in Asia, particularly in China, are far more flexible, and are able easier to shift arrival and sailing days at their terminals. Unlike, in Europe, such issues are not easily addressed generally because of the lack of space and berthing flexibility available at terminals. Furthermore, if a container vessels get delayed in China or other parts of South East Asia, because of seasonal port congestion, lines do not speed up in order to catch up with their schedule but sail using 'slow steaming' (Johnson, 2010). As a consequence, there are major disturbances sailing schedules which result in different operational and organisational challenges for the terminals.

4.2 Changes in port and terminal sector

Traditionally, ports have been seen simply as gateways where freight passes between ships and inland transports. But globalisation of trade and outsourcing has gradually transformed the actors in the transport chain. Customers’ demands have changed from straight shipping and forwarding to global logistics solutions and door-to-door transportation. Basic forwarders have become full logistics providers, major liner companies have evolved into intermodal logistics organisations (Notteboom and Winkelmans, 2001). Accordingly, as part of this changing environment ports and terminals had to be converted from site for transhipment into maritime logistics hubs in order to guarantee reliability, continuous service and a good productivity level (Nam and Song, 2010; Carbone and Martino, 2003). Some major structural and organisational changes occurred in UK ports and terminals which have contributed to their transformation.

4.2.1 Port ownership and management

Port organizations all over the world are experiencing a wide scope of institutional reforms as part of the adoption to new demands of shipping and international trade. Port authority is increasingly getting focused on policy and regulatory role while a range of private port operators and port service providers are taking over variety of port related services (Brooks and Cullinane, 2007, p.3). Privatisation of ports (private sector participation in the port industry) as a corporate strategy aiming to enhance port competitiveness by: increasing ports’ operation efficiency and allowing quick adaptability to changing customers’ demands.

In the era of just-in-time delivery the operation efficiency has become a vital criterion for port/terminal selection by liner companies and global logistics providers. Therefore, it is reasonable that port and terminal authorities and operators should well understand the
requirement of their customers and make considerable efforts to meet their expectations (Tongzon and Heng, 2005). Depending on the degree of privatisation there are four models of port ownership and operating structures for container port (Table 4.3).

<table>
<thead>
<tr>
<th>Models</th>
<th>Port Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Land ownership</td>
</tr>
<tr>
<td>Pure PUBLIC sector</td>
<td>Public</td>
</tr>
<tr>
<td>PUBLIC/private</td>
<td>Public</td>
</tr>
<tr>
<td>PRIVATE/public</td>
<td>Private</td>
</tr>
<tr>
<td>Pure Private sector</td>
<td>Private</td>
</tr>
</tbody>
</table>

Source: Baird, 1995

However, the method of port privatisation of the UK remains highly unusual. The ‘Anglo Saxon’ model has transferred the UK port sector from pure Public owned (100 per cent state owned and operated) to pure Private owned (100 per cent privately owned). This involved the wholesale transfer of all core functions of the port – land ownership; cargo handling (port operations) and regulation (Baird, 1995). The total deregulation of the UK port industry was expected to generate interest to investors and to increase port efficiency by exposing it to market forces.

Tongzon and Heng (Tongzon and Heng, 2005) made a comparative study between all four models of port governance concerning port operational efficiency. Their results showed that full privatisation was not a successful way of increasing ports operational efficiency because there was no linear relationship between extended private participation in ports/terminals and their efficiency. According to the study, the best extension of private participation in container ports/terminals was considered to be between the Private/public (67/33 per cent) and the Private (100 per cent) mode, implying that it was better for port authorities to limit the private sector participation within the “landowner and operator” functions and take over the regulatory function.

Moreover, Baird and Valentine (Brooks and Cullinane, 2007) analysed many international examples confirmed that selling off a port land (and dissolving the public port authority) was not a necessary precondition for securing private investments in ports. The lack of government control allowed private port successor companies to be free to deal with the port
land in order to realize maximum profit and quick return of their investments. As a result, the UK inter-port competition between private owners intensified and there was no clear national strategy for port development, although national ports were considered to become assets with a strategic importance to the trade. Still, the UK administration has been able to control port development projects using “environmental clearance” as a regulatory restriction. The rejection of Association of British Ports's planning application for the Dibden Terminal and the lack of environmental clearance regarding the future dredging of the Southampton approaching channel are just clear example of the strong regulatory position of the government.

Nevertheless, port privatisation have significantly contributed to the emergence of global port (terminal) operators (GPO) since they were able to acquire overseas port facilities. Their role in terminal development will be discussed in the next section.

4.2.2 Global port operators (GPOs)

Globalisation of shipping and trade is exerting considerable pressure on ports to reduce container terminal costs and improve operational efficiency. Mega shippers, 3PL and 4PL are generally looking for single supplier contracts thus seeking carriers that can provide efficient, express and cost effective services. Consecutively, the carriers are expecting cost reductions and efficiency benefits at the ports they utilise. As a result, the need for single sourcing across ports in terms of port terminal operations has become more common (Mangan et al, 2008). To respond to this market requirement and to the necessity for integration in global supply chains a number of GPOs have emerged. Some of these GPOs have been previously engaged in port and terminal business – Hutchison Port Holdings (Hong Kong); Port Authority of Singapore or PSA Corporation (Singapore); Dubai Ports Authority also known as DP World (Dubai); Eurogate (Bremen). These companies have expanded their operations extensively beyond their home ports through horizontal integration (mergers, acquisitions, concessions) (World Bank, 2001). For example, in 2006, following a ‘war’ with PSA, DP World acquired the port operations of P&O, a company based in London and listed on the London Stock Exchange. In contrast, other GPOs like AP Moller – Maersk (headquartered in The Netherlands), Mediterranean Shipping Company (Geneva), COSCO (Beijing) and APL (Singapore) have become major liner companies involved in later stage into terminal operations. The driving forces behind lines' decision to expand their scope of operations are total transportation cost and on-time delivery. The vertical integration of container shipping companies in terminal operations wanted to ensure that savings at sea with the use of big industry vessels (post-panamax, super post-panamax and ULCV) will not be lost on land (Notteboom and
Also, since most of the lines have been transformed into intermodal logistics organisations (Mearsk Line – Maersk Logistics; NYK – NYK logistics, APL – APL logistics, MOL – MOL logistics, OOCL – OOCL logistics), the use of dedicated terminals allows major liners to improve delivery times in door-to-door service hence bringing value to the final customer (Lun et al, 2010).

As a result, GPOs are managing an increasing number of the world’s ports and terminals. Their expansion has been facilitated by port deregulation and changes in ownership in many countries. Thus, investing and improving terminal infrastructure around the world allowed more regions to connect to the global freight distribution systems. Also, the establishment of terminals at different locations helped mitigate risks associated with specific regional or national markets. Such risks may include: wars or political instability; piracy or acts of terrorism; economic downturns; port congestions; strikes; environmental disasters (floods, earthquakes, hurricanes) (Noteboom and Rodrigue, 2010b). In addition, the emergence of GPOs has standardised management practices in terminals and significantly increased the efficiency of terminal operations in terms of vessel turn-around time and transhipment operations. Accordingly, GPOs account for terminal growth and profitability (Francoo and Lee, 2010). Nevertheless, the growth of GPOs has contributed to the increased intra-terminal competition in Europe (Figure 4.3).

Figure 4.3 Leading terminal operators in Europe

Source Notteboom, 2007
According to data from Drewry shipping consultants, today the major GPOs like Hutchison Port Holdings; AP Moller Terminals; PSA Corporation and DP World, also known as the “four sisters”, control 46.8 per cent of the terminal market (Table 4.4) (Drewry shipping consultants, 2010). These four GPOs manage ports or terminals geographically situated in close proximity to the main sea trading routes. Thus, the “four sisters” occupy premium locations that cannot be substituted. Since the income of terminals is linked to the traffic volume, the recent economic recession and the collapse of global container freight market have drawn these four operators into a fierce competition between one another. As container volumes diminished, the “four sisters” tried to gain competitive advantage through price leadership (providing the most cost-effective service) but at the same time keeping the same level of quality. In their study regarding the future of the GPOs, Notteboom and Rodrigue (Notteboom and Rodrigue, 2010) projected diminishing returns for the terminal industry in the forthcoming years. Therefore, the future competitive strategies of terminals should be based not only on the most cost-effective service but also on performance improvements and search for niche markets (segmentation).

Table 4.4 Throughput and market share of the four leading GPOs

<table>
<thead>
<tr>
<th>Global port</th>
<th>2009 Throughput</th>
<th>2009 Market</th>
<th>2008 Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>HPH</td>
<td>64.2 m TEU</td>
<td>13.6%</td>
<td>13.0%</td>
</tr>
<tr>
<td>APMT</td>
<td>56.9 m TEU</td>
<td>12.0%</td>
<td>12.3%</td>
</tr>
<tr>
<td>PSA</td>
<td>55.3 m TEU</td>
<td>11.7%</td>
<td>11.4%</td>
</tr>
<tr>
<td>DPW</td>
<td>45.2 m TEU</td>
<td>9.5%</td>
<td>8.9%</td>
</tr>
</tbody>
</table>

Source: Drewry Shipping Consultants Annual Review of Global Container Terminal Operators, 2010

4.2.3 Integration of ports and container terminals in a supply chain

Ports have been natural sites for transhipment transferring goods from one transport to another. They have provided the link between maritime and inland transport. However, in the new trading environment defined by global logistics solution, just-in-time delivery and door-to-door transportation the role of ports have changed significantly (Carbone and De Martino, 2003). In their contemporary position as members of supply chains, seaport container terminals are considered to be part of a group of organizations in which various logistics and transport operators are implicated into the ultimate goal to bring value to the final customer (Panayides and Song, 2008). Therefore, the role of ports as elements embedded to the value-driven chain systems has provoked acknowledgment of the importance of their integration (Robinson, 2002). If a seaport does not integrate, in other words provide only basic ship-shore
operations, a genuine risk of losing market share need to be considered. Subsequently, the competitive position of a port is no longer determined by its internal strengths (efficient cargo handling and hinterland connections) but also by its links in a given supply chain (Carbone and De Martino, 2003).

Therefore, in order to integrate and develop themselves as logistics platforms, ports should simultaneously work in several directions. Panayides and Song (Panayides and Song, 2008) define four particularly important variables as means of terminal supply chain integration (TESCI) (Figure 4.4).

![Figure 4.4 - Variables for terminal supply chain integration](image)

**Notes:** ICS – information and communication systems; VAS – value added services; MSO – multimodal systems and operations; SCIP – supply chain integration practices; TESCI – terminal supply chain integration

Source: Panayides and Song, 2008

### 4.2.3.1 Information and Communication systems (ICS)

The role of ICS in TESCI is described as a seamless communication system that facilitates efficient integration with supply chain partners and achievement of supply chain desirable goals. Moreover, the sharing of information among supply chain partners is recognised as a cornerstone of a solid business relationship and a necessary requirement for supply chain collaboration (Panayides and Song, 2008). Different studies showed that ICS improves the reliability, dependability and speed of operations in terminals hence boosting supply chain performance in terms of cost and service level. Carbone and De Martino (Carbone and De Martino, 2003) revealed that the presence of information and communication technologies have been vital parameters for facilitating the integration process between supply chain partners at the port of Le Havre. Paixao and Marlow (Paixao and Marlow, 2003) demonstrated that introduction of ICS influence greater integration, avoid duplication of documentation, improve operations and data processing to all participant in the transport chain with a
significant reduction of total port costs. ICS has become the backbone of successful terminal operations and important factor for TESCI.

4.2.3.2 Value-added services (VAS)

The VAS is defined as the ability of the port to add value to the services it provides in order to contribute further to the objectives of the whole supply chain (Panayides and Song, 2008). As it was discussed earlier, the growing recognition of the port as an accepted focus of industrialisation and value-addition has affected seaport container terminal development models and strategies. United Nations Conference on Trade and Development (UNCTAD) classified ports in terms of ‘generations’: ‘third generation’ ports offer VAS as well as the traditional ship servicing and cargo handling, and ‘fourth generation ports’ that provide more sophisticated range of logistics and value added services (Pettit and Beresford, 2010). However, value in business-to-business (B2B) market is separated into two different categories. The first one is functional value that is based on service availability, delivery service quality, and pricing (total cost of terminal service). The second one is relationship value that represents the quality of the relationship between the customer and the supplier of the service (Vitsounis and Pallis, 2010). Therefore, the VAS provided by seaport container terminal has the aim to bring both categories of value to their B2B relationship with supply chain partners. On the one hand, the VAS includes: the ability of a terminal to launch new tailor-made service for specific port user and to cater for specific needs of the market. Thus, terminals are able to provide state-of-the-art service and adapt swiftly to customers’ needs (Bichou and Gray, 2005; Paixao and Marlow, 2003; Robinson, 2002). VAS can also contribute to supply chain collaboration and development of strong business connection. The value, which is added for the customer, is not based on simple transactional exchange of a product for money. Instead, this value received by the customer has been created and delivered over time as relationship develops (Vitsounis and Pallis, 2010). For instance, a poor performance episode can be balanced by a positive perception of the relationship as a whole. Thus, it has become important for the seaport container terminal to maintain a good relationship with the terminal customer, since this makes the latter more tolerant towards occasional inferior performance.

4.2.3.3 Multimodal systems and operations (MSO)

According to Panayides and Song (Panayides and Song, 2008), the existence of systems to facilitate efficient and effective multimodal operations is defined as the MSO. The proficient use of different modes of transport connected by facilities at the container terminal has received extensive attention in the context of intermodal door-to-door transportation. Ports are
defined as bidirectional logistics systems (ibid.). Terminals receive containers from ships which are transferred to road, rail or inland waterway transport legs so as to be delivered to the consignee. At the same time ports accept intermodal freight shipments from road/rail and inland waterway and deliver them to vessels for the sea-leg. Consequently, such bidirectional logistics system requires a high level of coordination, interconnectivity and operation planning capabilities within the terminal. Therefore, the vertical supply chain integration of ports depends on their ability to provide adequate inter-connecting systems and operations for the multimodal interface (Paixao and Marlow, 2003). Furthermore, Bichou and Gray (Bichou and Gray, 2005) stated the importance for ports to serve and facilitate multimodal transport intersection in order to link flows and create supply chain patterns and processes of their own so to be considered as an integral part of the global supply chains.

Moreover, from a logistic channel standpoint, the port is a very important node since it operates as a logistics centre (Bichou and Gray, 2005). Cargo flows will seek routes that offer the fastest transportation and the lowest cost. Consequently, seaport container terminals that offer efficient hinterland accessibility due to productivity and reliability of their multimodal links will be more beneficial to shippers and consignees in the supply chain. As a result, such terminals will be able to compete for far-reaching cargoes and far-distant counterparts. Based on the above arguments, the ability of the terminal to offer interconnecting well-organised multimodal infrastructure and systems is an important factor of TESCI.

4.2.3.4 Supply chain integration practices (SCIP)

SCIP is defined by Bichou and Gray (Bichou and Gray, 2004) as the extent to which the port plans organises activities, processes and procedures beyond its physical boundaries and controls their performance. Example of such practices may include the involvement of a port in the process of optimisation of rail transhipments by the introduction of a new shuttle train service. The solution is developed together with supply chain partners (railway companies, rail operators, terminal operators, shipping companies and/or large shippers) (Panayides and Song, 2008). Accordingly, the SCIP also includes the extent to which terminal operators collaborate with other members of the supply chain in order to identify cost-effective and supply chain performance enhancing solutions for the intermodal freight passing through the port.

Although, supply chain management (SCM) supports partnership and integration, traditional activities in international transportation seem to favour conflict over collaboration (Bichou, 2009, p.239). For instance, the integration between liner companies and terminals is difficult to implement since both parties try to achieve maximum utilisation of their respective assets by transferring cost to each other. Other types of conflict can be found between freight forwarder
and shipping companies or between terminals and freight forwarders or logistic providers
(Francoo and Lee, 2010). Therefore, alignment of participating members in supply chain is not
sufficient for effective collaboration. Successful models of TESCI include incorporation of
essential components of SCIP such as: stakeholder analysis; business strategy; topology; cross-
functional processes; and enabling technology are also needed (Bichou, 2009, p.240).
SECTION 5 – Current challenges of DPWS

The identification of the current market challenges for DP World Southampton is essential for the critical analysis of the adopted strategies for terminal development and management. The findings of the previous two sections – the PESTLE analysis of the UK terminal market environment (Section 3) and the significant changes in the maritime and port sector (Section 4), and also the analysis of interviews conducted with experts from DP World Southampton; Import Service Ltd.; DB Schenker Ltd., have contributed to the recognition of the following current market challenges: the increased size of vessels visiting DPWS; increased container volumes per call; ‘slow steaming’; fierce port competition in the UK; the need for terminal integration in the supply chain.

5.1 The increased size of vessels visiting DPWS

As it was discussed in Section 4, the container shipping industry has globally changed towards the economies of scale as it was evident from 2011 vessel order book (Table 4.1, p.). More importantly the average size of all vessels operating on Asia – Northern Europe trade lane has increased from 8,161TEU in 2010 to 8,761TEU in April 2011. This change represents a significant increase forward because in 2009 the average size was 7,903TEU, and in 2008 6,294TEU (Beddow, 2011b). The liner companies and alliances currently operating in DPWS (Table 5.1) have correspondingly followed the industry trend of ‘gigantism’. For instance, between September 2010 and April 2011 four super post-panamax vessels (over 8000TEU) were delivered to CMA CGM; three to Hyundai Merchant Marine (Hanjin); one to Nippon Yusen Kaisha (NYK) (ibid.).

These significant industry changes have also been identified by DPWS. According to Expert 1, two years ago not a single super-post panamax class container or ULCV visited the terminal. Today, as per schedule, the terminal operators expect at least one on every seven days. Moreover, Expert 1 predicts that the demand for big vessels will continue to grow because more liner companies have recognised the benefits related to the economies of scale and he expects 13500TEU+ vessels to be the future industry workhorses on the Asia-Northern Europe trade route. Consequently, large container ships proved to be a major challenge for DPWS since these industry ‘giants’ have transformed Southampton from a four-berth container terminal into three-berth container terminal. DPWS decided to respond to that with a project for the redevelopment of 201 and 202 berths in order to accommodate bigger vessels (up to 400m), including the giants from Maersk Triple E-class. Mearsk Line used to operate in DPWS but since the introduction of Emma Maersk class, terminal proved to be unprepared to
accommodate the new class of vessel. The lessons had been learned and DPWS decided to be proactive. In other words, the container berth redevelopment would be supplied with the most sophisticated state-of-the-art ship-to-shore equipment to be able to provide service to the new Triple E-class (Expert 1, Interview 3).

<table>
<thead>
<tr>
<th>Grand Alliance</th>
<th>Hapag Lloyd</th>
<th>Nippon Yusen Kaisha (NYK)</th>
<th>Orient Overseas Container Lines (OOCL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Atlantic Services</td>
<td>Hamburg Sud</td>
<td>Hapag Lloyd</td>
<td>Nippon Yusen Kaisha (NYK)</td>
</tr>
<tr>
<td>New World Alliance</td>
<td>American President Line (APL)</td>
<td>Hyundai Merchant Marine</td>
<td>Mitsui OSK Line (MOL)</td>
</tr>
<tr>
<td>French Asia Line Service</td>
<td>CMA CGM</td>
<td>Australian National Line (ANL)</td>
<td>Delmas</td>
</tr>
<tr>
<td>Europe Pakistan India</td>
<td>CMA CGM</td>
<td>Australian National Line (ANL)</td>
<td>Orient Overseas Container Lines (OOCL)</td>
</tr>
<tr>
<td>Slot Charterers</td>
<td>Atlantic Container Line (ACL)</td>
<td>China Shipping Container Line</td>
<td>Deutsche Afrika Linien</td>
</tr>
</tbody>
</table>

Source: DP World Southampton Online, 2011

5.2 Increased container volumes per call

The increased size of vessels visiting DPWS has resulted in enlarged container volumes per call. Respectively, DPWS needs to provide fast stevedoring operations and turn-around time
for the big container ships visiting the terminal because vessel time spend in port is considered negative return for the lines. The company realises that speed of operations has become an important criteria for selection of a terminal by the liner companies (Expert 1, Interview 1). In turn, in November 2010, DPWS has conducted its first customer satisfaction survey with shipping lines. 59 per cent of all shipping lines operating in the port of Southampton responded to the survey. Even though most of them were satisfied with the performed service (79 per cent), vessel productivity was identified as an area for further improvement in the terminal. As a result, improving shipside productivity has been defined as a number one company objective for 2011 and a goal to reach 23 moves per hour has been established. Also, DPWS decided to hold regular strategic planning meetings with the Grand Alliance and New World Alliance in order to discuss productivity improvement and identify solutions for the benefit of everyone in the ship to terminal supply chains (DPWS Online, 2011).

Moreover, the increased volumes of containers per ship call combined with the fact that DPWS limited container dwell time in the terminal to just three days have provided additional challenges for the transhipment operation in DPWS. The internal container movements of hundreds of boxes need to be done as swift as possible so as the containers stacked in the precise areas for further distribution. DPWS should reassess its operational practices to increase efficiency in terms of speed and to provide accurate information for the exact location of each box in the terminal.

5.3 Challenges of the ‘Slow steaming’

As already discussed in Section 4, ‘slow steaming’ has become major corporate strategy for container shipping. Convincing evidence is the new Maersk Triple E-class vessels design speed of 19 knots and maximum speed of 23 knots. This compares with the original average industry design speed of 24 knots and reflects Maersk’s management conviction that ‘slow steaming’ is here to stay (Fossey, 2011b). Though, ‘slow steaming’ saved millions of US dollars for the lines it has created considerable complexities to the terminals. Liner service is based on time that is to say on previously established schedules. However, scheduled reliability of a liner service depends on the transit reliability. Therefore, any transit disturbances result in scheduled unreliability in ports and terminal, and throughout the supply chain. The causes for these disturbances may be piracy, port congestion, weather conditions or other delays. Accordingly, ‘slow steaming’ had similar effect on transit reliability because it caused major rearrangement of the already established schedules.
‘Slow steaming’ has created significant challenges for DPWS because berthing schedules and transhipment schedules (Vehicle Booking System; Train schedules; Feeder berthing schedules) need to be reorganised. Moreover, DPWS managers noticed that if container vessels get delayed in China or in other parts of South East Asia, as it happens usually during peak seasons due to port congestion, do not speed up in order to catch up with their rearranged schedules but sail using ‘slow steaming’. As a result, major disturbances appear in transit schedules which cause scheduled unreliability in the terminal and create various operational and organisational challenges for DPWS (Expert 1, Interview 3). A possible solution for these challenges could be the sophisticated ICS that are presently used in the terminal which would allow accurate information sharing to notify timely supply chain partners for any changes in the schedules.

5.4 Increased port competition in the UK

UK terminals are currently engaged in a tough competitive struggle with other terminals and container ports in the UK market, not only for tonnage and volumes, but also for shipping lines and investments in infrastructure. Several essential factors have contributed to the intensity of port competition in the UK. Foremost, the ‘Anglo Saxon’ model for port privatisation (Section 4, Port Privatisation) has transformed all major UK container terminals into private owned companies. As such their main goal remains: to maximise their profit in order to satisfy the demands of their shareholders; to protect their maker share; to grow and expand. Additionally, some of the major terminals in the UK are operated by GPOs – DP World and Hutchison Holding, two companies that are involved in fierce global rivalry for market share (DP World, 2011a). Therefore, based on these two facts, terminals in the UK market will most likely compete among one another rather than cooperate. Another factor contributing for the intensive terminal opposition is the decreased demand in terminal service, which has resulted from the effect of global recession on UK economy. Accordingly, major terminals in the UK experienced decrease in their throughput in 2008 and 2009 (Table 5.2). For some container ports the effect of the economic recession was even more detrimental because some liner customers decided to either cancel or transfer some of their traffic to competitor’s port (Beddow, 2011b). DPWS has lost almost 30 per cent of its throughput (515,000TEU) during this two-year period which, as it is seen from Table 5.2, is considered to be the biggest loss of market share among the major terminals in the UK.
Table 5.2 – UK port container throughput 2006-2010 (TEU)

<table>
<thead>
<tr>
<th>Port</th>
<th>2006</th>
<th>% change</th>
<th>2007</th>
<th>% change</th>
<th>2008</th>
<th>% change</th>
<th>2009</th>
<th>% change</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Felixstowe</td>
<td>3,000,000</td>
<td>10.0</td>
<td>3,300,000</td>
<td>-3.0</td>
<td>3,200,000</td>
<td>-3.1</td>
<td>3,100,000</td>
<td>9.7</td>
<td>3,400,000</td>
</tr>
<tr>
<td>Southampton</td>
<td>1,500,300</td>
<td>24.6</td>
<td>1,870,000</td>
<td>-13.5</td>
<td>1,617,000</td>
<td>-16.2</td>
<td>1,355,000</td>
<td>13.7</td>
<td>1,540,000</td>
</tr>
<tr>
<td>Themesport</td>
<td>604,000</td>
<td>-11.6</td>
<td>534,000</td>
<td>14.4</td>
<td>611,000</td>
<td>-29.0</td>
<td>434,000</td>
<td>3.5</td>
<td>449,190</td>
</tr>
<tr>
<td>Tilbury</td>
<td>454,400</td>
<td>4.1</td>
<td>473,000</td>
<td>15.2</td>
<td>545,000</td>
<td>-16.3</td>
<td>456,000</td>
<td>13.5</td>
<td>517,568</td>
</tr>
<tr>
<td>Liverpool</td>
<td>630,000</td>
<td>10.3</td>
<td>695,000</td>
<td>-1.1</td>
<td>687,700</td>
<td>-14.5</td>
<td>588,000</td>
<td>15.8</td>
<td>681,000</td>
</tr>
<tr>
<td>Teesport</td>
<td>340,805</td>
<td>-39.6</td>
<td>206,000</td>
<td>14.6</td>
<td>236,000</td>
<td>75.4</td>
<td>414,000</td>
<td>45.0</td>
<td>600,300</td>
</tr>
<tr>
<td>Total</td>
<td>6,529,505</td>
<td>8.4</td>
<td>7,078,000</td>
<td>-2.6</td>
<td>6,896,700</td>
<td>8.0</td>
<td>6,347,000</td>
<td>13.3</td>
<td>7,188,058</td>
</tr>
</tbody>
</table>

Source: Department of Transport, 2011

Although 2010 has shown improving figures for the UK market (Table 5.2), Expert 1 from DPWS predicts that market rivalry between major terminals in the UK market will grow. His concerns are backed up by the fact that many of the port development plans supported by the UK government are based on the MDS Transmodal Ltd. 2007 forecast (Expert 1, Interview 3). However, MDS Transmodal’s prediction did not include different scenarios, especially global recession and problems with UK national debt crisis. Respectively, the terminal demand forecast for 2020 has been reassessed and corrected in 2009 resulting in only 45 per cent of the original forecast (Figure 5.1) (Section 3, Economic factors).

![Figure 5.1 - Revised forecast for the UK market (0000 TEU)](image)

Source: MDS Transmodal, 2011

Although the revised prediction was gloomy and anticipated slow market recovery and growth, Expert 1 from DPWS states that Felixstowe, London Gateway and Teesport have pushed the
start button for their development. Additionally, according to his opinion, once fully operational, London Gateway will bring additional 3.5 million TEU capacity to the UK market or 38 percent of the original forecast which will be able to account for most of the revised demand prediction (Figure 5.1). Moreover, Felixstowe South’s expansion has already been completed and the port expects to open the first two deep-water container berths in mid 2012. Even though Liverpool and Bristol are currently reassessing their development projects and are waiting for economic tide to turn in order to commence them, Expert 1 still anticipates potential market oversupply in the future. Accordingly, he considers that slow market recovery combined with increased oversupply may result in fierce competition in the UK market (Expert 1, Interview 3). Therefore, Southampton should swiftly follow the deep-sea developments of its main competitors - Felixtowe and London Gateway, in order to gain strong competitive market position.

5.5 The need for terminal integration in the supply chain

According to Expert 1, DPWS is aware of the fact that the terminal is operating in the era of door-to-door transportation and just-in-time delivery. As it was discussed in Section 4, the current transportation approach is based on competition between supply chains, in which seaports are merely linked. However, the majority of warehouses in the UK (80 per cent) are located in the so called ‘golden triangle’ in the Midlands near Birmingham where is the greatest interchange of motorway connection is (Expert 1, Interview 3). Accordingly, the traditional intermodal UK distribution model includes containers imported from southern deep-sea ports – primarily Felixstowe and Southampton – to be moved to a distribution centre (DC) located in Midlands, where containers are rearranged into smaller palletized units, which are then regionally distributed (van Marle, 2011b). This means that DPWS is a part of long supply chain with significant volume of goods to be warehoused, high proportion of container imports, and great proportion of goods changing different modes of transport. Thus, DPWS should provide sophisticated information communication systems (ICS) and value-added activities as well as to offer efficient hinterland accessibility due to productivity and reliability of terminal’s multimodal connections in order to achieve successful TESCI.

5.5.1 Information and communication systems (ICS)

All of the interviewed experts have recognised the importance of ICS for the terminal operations and integration. The experts from Import service and DB Schenker, as well as shipping lines operating in the port, expect DPWS to have sophisticated ICS that is able to provide 24/7 visibility over terminal operation. Their requirements include easy accessible,
reliable and accurate information about: changes in vessel schedules; estimated time of loading/unloading of containers; container’s position in the terminal; discharge availability; HMC clearances; and other commercial restraints that may prevent container distribution. The present ICS in DPWS allows both logistic companies (Import Service and DB Schenker) and lines operating in DPWS to arrange a more timely collection of their containers, thus potentially reducing the dwell time in the terminal (Expert 2, Interview 2; Expert 3, Interview 4; DPWS online, 2011). Moreover, Expert 2 states that supply chain collaboration has become a key factor for Import service’s operations and would not be possible without ICS. Because of sophisticated and accurate information sharing the company is able to plan in advance their haulage, which is essential for a road logistics provider taking into consideration the current problems with major road and motorway congestions in the UK. Also, ICS of DPWS enables the company to get its freight more quickly to provide excellent performance to their end-customers in order to keep their satisfaction level high (Expert 2, Interview 2). As a result, DPWS should possess state-of-the-art ICS, which the company should continue to improve, since they have become the backbone of successful terminal operations and an important factor for supply chain integration.

5.5.2 Value-added activities (VAS)

Ports should be seen as key elements in value-driven chain systems that contribute to supply chains through the creation of a competitive advantage and value-added delivery (Robinson, 2002). Therefore, in order to follow the UNCTAD model (Section 4) DPWS should provide VAS besides the traditional ship services and container handling. However, the UNCTAD model application does not assess ports’ specific development limitations. Moreover, Robinson (Robinson, 2006) argues that coping a model, rather than developing a long-term individual strategy, may provide interim solution, but eventually would bring “chronic disequilibrium” to the port system. For that reason, the specific DPWS’s limitation first should be identified for a proper VAS to be generated.

Expert 1 explains that DPWS is a terminal limited in its physical ability to grow. High price and low-availability of free land in the Southampton region are recognised as major obstacles for further terminal development and provision of VAS. DPWS is located in densely populated district with lots of environmental protected areas. The container terminal does not possess any warehouses, inland container freight station and trucks thus it does not provide any extra logistic activities (Expert 1, Interview 1 and Interview 3). Therefore, DPWS has abandoned vertical integration as a possible strategy to add value to the supply chain and has decided to concentrate on its core competencies – fast stevedoring operation and transshipments.
Still, Expert 1 states that DPWS is constantly looking for other ways to attract new customers and to enhance their business. The company recognises port-centric logistics (PCL) as one of them. Although DPWS has never been a big centre for port-centric distribution, the company and its business partner Import services Ltd. seek new market opportunities to expand the scope of PCL in DPWS. (Expert 1, Interview 1). The rationale behind this strategic decision is the fact that major terminals like Felixstowe and Teesport have been providing PCL for years and they have seen this business growing fast (Felixtowe; Teesport). Consequently, DPWS is seeking vertical integration through close business partnership with PCL provider Import Service.

Still, Expert 1 explains his concerns related to PCL. The model is applicable only to certain commodities and cannot be "an answer to everything". He considers that it would be very difficult to change the current distribution practices in the UK due to the fact that 80 per cent of all warehouses and DCs are located in Midlands (Expert 1, Interview 1). Other terminal managers also agree that people with heavy investments in inland distribution and warehousing will strongly oppose to the development of PCL (Teesport). Therefore, DPWS will create value to supply chain by concentrating on its core activities but also by supporting its vertical integration through partnership with Import Service in PCL.

5.5.3 Multimodal connections

As already stated in Section 4, port hinterland connections and multimodal links are key factor for TESCI. Terminals with efficient hinterland accessibility due to productivity and reliability of their multimodal links are able to compete for far-reaching freight volumes and far-distant end-customers (Section 4). Expert 1 also recognises the significance of multimodal connections for terminal selection by liner companies. The well-organised multimodal infrastructure (road, rail and short sea shipping) let DPWS become a part of longer supply chains reaching to Spain, Portugal, Scandinavia, Scotland, Ireland, and East and West Coast of England. Good multimodal links are essential since they would enhance port competitive position not only in the UK but also in the European market. Thus, superior multimodal infrastructure would allow DPWS to be developed as a major hub for containers coming from Asia and destined to Western Europe and even North America. Moreover, Expert 1 states that one of DPWS key challenges for the future is the reduction of road transhipments and growth of intermodal freight transhipped by rail and sea (Expert 1, Interview 1; Expert 1, Interview 3). Therefore, DPWS should continue to develop its multimodal links, especially rail and short
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To sum up, the DPWS current market challenges are:

- To accommodate the large terminal clients since liner shipping is growing in size.
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6   SECTION 6 – DPWS adopted strategic solutions

After the current market challenges for DPWS have been identified, this section will analyse the adopted strategic solutions of the port. Firstly, every strategy will be defined using primary data gathered from a series of interviews held with Mr. Neil Fletcher – Senior Account Manager at DPWS (Expert 1), DPWS presentations and DPWS Internet page. Secondly, the assessment of the terminal strategies will be based on different theoretical models and information taken in interviews with experts and representatives from the terminal, logistics companies and government bodies.

6.1 Accommodation of the large shipping customers

Based on the findings of the previous sections, vertical and horizontal integration of liner companies has resulted in a concentration of bargaining power at terminal demand side. Mergers and alliances have shaped the global shipping industry (horizontal integration) and some of the lines became logistics providers (vertical integration) (Section 4, Increased vessel size). Therefore, in the current container market environment, the loyalty of a container shipping company cannot be taken for granted. Consequently, terminals face the constant risk of losing important clients because of deficiencies in port infrastructure or terminal operations.

To respond to this DPWS has adopted the following strategic solution: redevelopment of 201 and 202 berths to create dedicated berth for the industry ‘giants’ to respond to the increasing size of container vessels visiting the port of Southampton (Expert 1, Interview 3); and dredging operations to deepen two berths and widen another (DPWS online, 2011);

6.1.1 Redevelopment of 201 and 202 berths

The increasing size of containership visiting the port of Southampton has transformed DPWS from a four-berth container terminal into three-berth container terminal (Section 5, p). As a result, the berthing capacity of the terminal has been decreased by 25 per cent. To respond to this industry challenge DPWS has decided to redevelop the general cargo 201 and 202 berths into one berth capable of accommodating vessels up to 600 metres and draft up to 16 metres. A systematic approach for port development will be applied to evaluate this strategic decision. The methodology is created by Sanches and Tuchel. Their explanation is constructed from the interaction of the different components as shown in the figure below (Figure 6.1). All four factors (economic; social/environmental; political and physical) are interrelated and have varying impact on port development. Two types of environment, which affect the different
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components, are defined by the authors – local and global environment. For certain components either local or global environment has predominant effect (Coto-Millán et al, 2010). For the purpose of the research, the affect of each one of these components on DPWS redevelopment project will be analysed.

Figure 6.1 Components and influences of port development

6.1.1 Economic

The analysis of the economic component is significant for financial planning because it is closely related to return of investment. Since the reconstruction project will cost GBP 80 million, a thorough investigation of the economic factors, such as the UK containerised cargo demand forecast and demand for deep-sea container vessels, will be conducted.

The increasing number of large container vessels operating globally has the most profound effect on the strategic decision of DPWS for berth redevelopment. The benefit of economies of scale related to the large container ships have been embraced by most of the big industry players as it is evident from the already discussed 2011 order book (Table 3.1, Section). In addition, the size and number of big industry vessels, operating in DPWS, have been
increasing for the last two years. Also, Expert 1 expects demand for such vessels to grow and states that 13500TEU+ vessels will be the future workhorses on Asia – Northern Europe trade lane (Expert 1, Interview 3).

Furthermore, the slow recovery of the UK economy and revised container demand market forecast may prove to be serious obstacles to the redevelopment project. The problems with UK national debt and the fact that the reassessed forecast shows (Figure 5.1) only 44 per cent of the formally predicted increase the terminal demand may create fierce market competition among ports. In addition to that, Expert 3 considers that the UK market demand for containerised cargo will be too weak to support the development of two big terminals - DPWS and London Gateway. She believes that eventually, they will compete for the same market since they are located within such close proximity. Moreover, Felixstowe new deep-water berths will be fully operational in 2012 and London Gateway project will be completed in 2013. In contrast, DPWS’s redevelopment project will commence in September 2012 (due to environmental reasons) and probably will be completed in 2014 (Expert 1, Interview 3). Nonetheless, Expert 3 recognises the importance of DPWS development for the growth of the local business. She considers that DPWS deep-water expansion will prevent Felixstowe and London Gateway from holding monopoly over large vessels in the UK (Expert 3, Interview 4).

6.1.1.2 Social

Ports play important role in for regional economic development. However, terminal development is directly or indirectly related to the use of local resources (land, water channels, roads, railways). Therefore, to be accepted, a terminal growth should bring more benefits than drawbacks to all local stakeholders (users; terminal operators; port bodies; local government; local business community and households).

The 201 and 202 berths redevelopment will definitely increase throughput because terminal will be able to accommodate bigger vessels, hence larger container volumes per call. Since throughput is considered as a measurement for terminal performance, it will attract more cargoes and will enhance competitiveness and sustainability of local business. Moreover, one of the micro-economic effects of the increased throughput will be increase of employment. According to Expert 1, the new container berth expansion will create more local workplaces, not only at the port but throughout the whole intermodal supply chain. Expert 1 considers that in addition to the reduced unemployment in the area, the expansion will stimulate economic development of the whole region (Expert 1, Interview 3). Therefore, the redevelopment project will have beneficial effect on the recovery of the local economy from the current economic
recession. According to Expert 1, last year Port of Southampton was responsible for more than 30,000 jobs in the area and created GBP 5.5 billion in domestic product (Expert 1, Interview 3).

Additionally, DPWS has been very supportive to the local community. Expert 1 states that the company has been involved in different charity activities and donations (Expert 1, Interview 3). Some of them include: £8,000 for a kitchen for Marchwood Scouts Group's planned new hall next year; £4,000 for a soundproof curtain at Ashurst Pre-School in the New Forest; a £2,000 inflatable tumble track for Calmore Acro Zone and a £5,000 gazebo at Calmore Junior School; £1,700 worth of sponsorship for New Forest Volleyball Club; £4,000 for youth help charity No Limits in Southampton and £3,400 for new lifejackets for the Rona Sailing Project near Hamble (DPWS online, 2011). Thus, DPWS affirm commitment to support the local community.

6.1.1.3 Environmental

In 2004, the Dibden Terminal development was rejected by the government on environmental grounds. This cost ABP Southampton 13-month planning and GBP 45 million (ABP Annual report, 2005). DPWS has decided to avoid such costly mistakes. In 2008, ABP Southampton has developed an Environmental Impact Assessment (EIA) of the proposed Berth 201/202 works in accordance with the provisions of the Marine Works (EIA) Regulations 2007. In order to assess the environmental effect of all operations related to the project, four different groups were adopted: insignificant; minor; moderate and major. The effect of the reconstruction work on the migratory patterns of the Atlantic salmon was considered to be “major adverse significant”. As a result, dredging works and piling can only be performed between September and March each year with the aim of reducing the environmental effect from “major adverse significant” to “insignificant to minor adverse significant” (ABP Southampton, 2008). This project delay shows DPWS determination to follow all environmental practices in their development in order to avoid mistakes like Dibden Bay. Expert 1 also recognises the breeding characteristic of the Atlantic salmon as the only serious environmental concern regarding the redevelopment of berth 201 and 202. He also implies that the most modern equipment which is much more silent and environmental friendly will be used during the reconstruction to reduce noise and avoid any pollution (Expert 1, Interview 3). Current global and UK environmental concerns require DPWS to be proactive and to follow strict environmental policy. Thus, the company would avoid any regulatory problems with the future redevelopment and any damage to the environment or its reputation assets.
6.1.1.4 Political

As commented in Section 3, the UK policy towards ports development has changed dramatically. Port of Southampton has been recognised by the UK government as a gateway to two of the strategic corridors of national importance (Figure 6.2): from London to Southampton (number 3) and South Council Ports to Midlands (number 4) (ABP Southampton, 2008). Therefore, in accordance with local and national strategic policy the berth redevelopment will not only lead to significant benefits for the port itself, but also for the local, regional and national economy.

![Figure 6.2 – UK key strategic transport corridors](image)

Source: ABP, 2008

As representatives from ABP Southampton confirm, the decision to improve the existing infrastructure is entirely consistent with the principles of sustainable development, as the improved berth facilities will naturally consolidate the infrastructure already in place at Southampton’s container terminal. Thereby ABP Southampton will avoid the need to identify and bring into use suitable alternative land within the port estate. However, ABP should strictly follow the government legislation: Southampton Harbour Act 1911; Food and environmental protection Act 1985; British transport Docks Act 1966; Conservation Regulation 1994; Town and Country Planning Order 1995 (General Permitted Development).
All these pieces of legislation will allow the government to control: the process of dredging of a small area of seabed immediately adjacent to the berth pocket; the disposal of dredged material; the effect of dredging and construction on designated nature conservation sites (ABP, 2008). All of these important issues have been assessed and discussed in the 201 and 202 redevelopment plan. As a result, the plan has received consent from the government’s newly-created Marine Management Organisation (Hailey, 2011).

6.1.1.5 Physical infrastructure

As the Expert 1 states, DPWS is really limited in its physical ability to grow (Expert 1, Interview 1). The area of Dibden has been designated as a Site of Special Scientific Interest (SSSI). Possible future expansion there would require considerable works in terms of dredging, construction of new quay walls as well as the introduction of necessary infrastructure to bring good hinterland connections to the site (Expert 1, Interview 1). Also, doing nothing would mean that the terminal will operate with only three deep-sea berths rather than four. This would inevitably lead to more berthing delays, which would considerably decrease terminal operational efficiency thus making DPWS less attractive terminal of call.

Therefore, due to the physical restrictions, Expert 1 recognises reconstruction of 201 and 202 berths as the best solution for future terminal development. The main advantages of this redevelopment are:

- The infrastructure is already in place and only partial strengthening of the quay wall (to support super post panama cranes) and dredging in the small area adjacent to the berth will be required.
- The berth is located in close proximity to the other operational areas of the terminal which provide good internal transportation of containers
- Being closest than any other terminal berths to the turning basin the new berth will make berthing manoeuvre easier.
- The area is located in the terminal thus it will have the same well-organised hinterland connections (no further investments in infrastructure will be required)

The deepening of berths 201 and 202 and consequent reconstruction of the berth walls is decisive if the DPWS is to be able to continue to service international container trade, especially in the nationally important Far East to Northern Europe container ship services. Moreover, the project will prove additional benefits to the local community in terms of employment and enhancement of the local business. The reconstruction is supported by the government and should follow the best established environmental practice in the industry. As
far as the physical infrastructure is concerned, this reconstruction remains the only possible option until the current terminal area does not reach its full capacity (approximately four million TEU as per Expert 1).

6.1.2 Deepening of existing berths

In April 2011, DPWS has completed dredging work to deepen two of its existing berths and widen another one in order to accommodate larger industry vessels. The dredging works comprise the following berths (Beddow, 2011a):

- Berth 205 has been deepened from 13,0 to 14,0 metres
- Berth 206 has been deepened from 13,6 to 14,6 metres
- Berth 207, with a depth of 15,0 metres, has been widened to 55 metres.

Although this strategic step has provided an average depth of 14,0 metres alongside 80 per cent of its berths, and the future depth of the reconstructed berth is planned to be 16 metres, the depth of the approaching channel remains 12,6 metres. This significant drawback has also been recognised by Expert 1. He explains that the ABP Southampton’s project for dredging of the approach channel has been delayed due to the lack of environmental clearance for more than two and a half years. He hopes that deepening of the channel will commence soon so as to be able to finish by the end of 2014 when the redevelopment of 201 and 202 berth target is planned (Expert 1, Interview 3).

6.2 Increase terminal efficiency

The reassessment of DPWS operational efficiency is required due to the increased size of containers per call (because of increased vessel size) and the fact that speed of ship-to-shore operation has become major factor for terminal selection by the liner companies. Also, Expert 2 recognises the importance of quick stevedoring operation for making containers available quickly and increasing the speed of the follow up transhipment or distribution operations. (Expert 2, Interview 2)

The fast vessel turn-around time is related to berth productivity (container mover per hour). Following the performed first customer satisfaction survey with shipping lines, improving shipside productivity has been defined as the number one objective of DPWS for 2011 and a goal to reach 23 moves per hour has been established. Expert 1 explains that DPWS has already achieved target of average 25 container moves per hour. Also, some of company’s latest performance indicators show even better results – 26/27 container moves per hour.
Moreover, as far as equipment of the reconstructed of 201 and 202 berths is concerned, Expert 1 clarifies that six state-of-the-art STS cranes will be used. Their operational reach will be 23 containers and they will be able to service Mearsk Triple-E class vessels and to provide fast and efficient container handling (Expert 1, Interview 3).

DPWS steps to improve ship-to-shore productivity include complicated system of activities: regular strategic planning meeting with liner shipping customers; well-organised operations; good internal communication in the terminal; excellent equipment maintenance; retaining of talented staff and constant training (Expert 1, Interview 3). Expert 2 also identifies the ongoing education and training program (regular meeting between employees from DPWS and Import Service Ltd. operational departments) as another move to improve terminal efficiency.

Also, DPWS use straddle carriers for the internal transportation of containers in the terminal. Reassessing their operational strategies has been another strategic solution to improve ship-to-shore productivity as well as the internal container movements. Expert 1 explains that DPWS has been divided into three separate operational areas – West, Central and East. Thus, most of the length of a container journey is done by trucks. As a result, straddle carriers make short runs increasing their operational efficiency (Expert 1, Interview 1). Also, DPWS has adopted straddle carrier ‘dual cycling’ (Figure 6.3). According to Expert 1, ‘dual cycling’ not only reduces unproductive/empty gantry moves but also decreases empty trips of horizontal transfer equipment. As a consequence, this strategic solution has created faster, energy efficient and eco-friendly crane and straddle carriers operations.

Figure 6.3 Straddle carrier single and dual cycling

Source: Acosta, 2009
6.3 ‘Slow steaming’

‘Slow steaming’ has saved millions of US dollars for liner companies, but it also has created significant challenges for DPWS. Expert 1 insists that berthing schedules and transhipment schedules have to be reorganised constantly due to delays caused in China and South East Asia and the fact that vessels do not speed up to catch up with their schedule (Expert 1, Interview 3). To respond to this significant challenge, DPWS relies on a good organisation planning and information sharing with its business partners. The effect of scheduled unreliability of deep-sea vessel is easily transferred into schedules of feeders or short sea shipping service providers.

The solution to this issue is the supply chain collaboration. Lots of information flows are concentrated in terminals and their ability quickly to process and analyse information is essential for the planning of their operations. According to Expert 1, when deep-sea vessels get delayed, DPWS sends information to the operational managers of their feeder service partners. Thus, they are able to decrease the speed of their vessels in order to spend the postponement at sea, rather than in the terminal, where anchor or berth charges will make the delay even more expensive. Expert 1 underlines that big vessels berthing prior to the arrival of the feeders is done so that all containers for transhipment to be discharged and loaded immediately on the feeders to increase the speed of transhipment operation (Expert 1, Interview 3). However, the supply chain collaboration in DPWS is possible due to the complex and sophisticated terminal operating system “Navis Sparcs”.

6.4 Terminal supply chain integration

6.4.1 Information and communication systems (ICS)

DPWS has a long lasting tradition in ICS. The company was the first European terminal to introduce vehicle booking system, which significantly improved road transhipments and reduced terminal congestion (DPWS online, 2011). Expert 1 recognises ICS as the backbone of successful terminal operations. In turn, DPWS continues to provide sophisticated, reliable and accurate ICS to its respective customers.

6.4.1.1 Navis Sparcs

Currently the company is using Navis Sparcs as terminal operating system (TOS). Navis Sparcs is a state-of-the-art TOS which provides several important benefits to DPWS and the terminal users: information sharing; improved yard utilisation; and optimisation of terminal resources (Expert 1, Interview 3)
• Firstly, as far as supply chain collaboration is concerned, information updates are communicated throughout the entire system in real-time. This concept simplifies work, improves coordination, and increases responsiveness throughout the terminal operation. Thus, vessel, yard, road and rail planners make decisions in real-time to avoid congestion and increase efficiency in their respective operations (Kumar, 2006).

• Secondly, Navis Spares improves yard utilisation. A function of the system called Expert Decking helps space-constrained terminals, such as DPWS, to increase utilisation of yard space in order to handle growth without adding new land (Navis online, 2006).

• Lastly, Navis Spares allows optimising of the terminal resources. Functions like Quay Commander and Auto Stow combine yard and equipment constraints with operating business rules to optimise work assignments in real-time for efficient use of equipment, shorter travel distances, fewer un-laden moves, and lower fuel, labour and maintenance costs.

Navis Spares is highly valued by all interviewed experts. According to Expert 1, the system provided efficient planning, tracking and tracing, yard management. As a result, it has significantly improved terminal productivity in terms of vessel turn-around time. As far as logistics companies are concerned the system provides 24/7 visibility over DPWS operations. Accordingly, terminal customers are able to plan in advance and execute time and cost efficient transport hence bringing value to their end-customers. (Expert 1, Interview 3). The importance of information sharing and operational visibility has also been recognised by Expert 2. Navis Spares has been highly estimated by operational managers from “Import service” ltd. because the system assists in reducing waiting times and made containers available more quickly (Expert 2, Interview 2). Moreover, Expert 3 identifies the Discharge schedule that Navis Spares provides as a vital source of information for the availability of containers to be collected and distributed. This considerably enhanced the planning capability of the DB Schenker.

6.4.1.2 CNS Compass

Since November 2010 DPWS has introduced new EDI system - CNS Compass. CNS compass links port and terminal operators, regulatory bodies (customs, veterinary control, etc.), shipping lines, freight forwarders, logistics operators and haulers providing total visibility to all partners in the supply chain. The systems provides: electronic access for automatic custom clearance; inventory control for container movements in and out of the terminal; allows freight forwarders and logistics operators to monitor the progress of the progress of the cargo and to plan in advance the distribution. (Expert 3, Interview 4; CNS compass online, 2011).
According to Expert 1, CNS is highly valued by DPWS customers because of its reliability - there has not been a single registered problem related to the system since it was introduced in November 2010.

6.4.2 Value-added services

As it was discussed DPWS is focused on its core competencies – fast stevedoring operations and transshipments (Section 5, VAS). Thus, the company aims to add value to its clients through speed of performed operations, good multimodal connections and sophisticated ICS. However, the company has recognised port centric logistics (PCL) as a way to attract new customers and enhance remaining clients' business (Expert 1, Interview 1). According to Expert 2, the demand for PCL has grown for the last couple of years and will continue to grow. The explanation of Expert 2 - more companies become aware of the benefit related to this model of transportation. According to Mike Thomas, Client Service Director at Import Service, PCL improves the speed to market of fast moving products by relocating the regional distribution centres in close proximity to the port or in the port itself (Figure 6.4). By reorganising whole section of the chain, PCL aims at minimising the waste of resources, time and materials. Moreover, PCL meets environmental objectives reducing road miles thus reducing carbon emissions and cutting down on road congestion (Expert 2, Interview 2).

Figure 6.4 – Port Centric logistics concept versus regional distribution centre

![Port Centric logistics concept versus regional distribution centre](image)

Furthermore, Expert 2 states that PCL can benefit not only logistics providers and freight forwarders but also container lines operating in DPWS and could become a decisive factor for terminal selection in the future (Expert 2, Interview 2). Major competitors of DPWS like
Felixstowe, Themesport and Teesport have been big centres for PCL. Therefore, PCL could be a source of competitive advantage for DPWS in the future. Expert 2 explains that today's competition is a competition between supply chains. Therefore, if supply chain is faster, cheaper and more efficient, more companies are going to use it. Respectively, customers will use the ocean freight service and routes to Southampton (Expert 2, Interview 2).

Nevertheless, PLC cannot be applied to every cargo or commodities. Currently, the scope of containerised commodities toward this new transport model is appropriate and includes: fresh products; high vale electronics; toys; gifts; sports equipment. All of these supply chains include manufactured or finished goods and are applicable to big retailers such as ASDA, Tesco, Next, Marks and Spencer; ToysRus; Sports Direct, etc. However, when it comes to manufacturer with particular inbound of goods from different supply chains going to different ports, it will be difficult for the PCL to be applied. As Expert 2 confirms that a specific product, which requires consolidation before final distribution, could be a serious obstacle for the use of PCL in this particular supply chain. However, for organisations importing manufactured products PCL could be a source of competitive advantage (Expert 2, Interview 2).

In the current market environment, DPWS should look for new ways to retain existing customer and attract new ones. Expert 1 states that part of DPWS marketing strategy includes looking for business opportunities to develop further PCL with their partners from Import Service Ltd. A confirmation for these good resolutions is the fact that Import Service has built 17 000 m³ warehouse in close proximity to DPWS terminal area (Expert 1, Interview 1).

### 6.4.3 Improvements in multimodal infrastructure

A good multimodal infrastructure is essential for the successful development of DPWS into a major hub. Also, well-developed multimodal connections are vital for fast container transhipments hence the terminal becomes part of various and longer supply chains. The current transhipments in the terminal as per Expert 1 are: 64 percent road; 27 per cent rail; 9 per cent SSS. Moreover, Expert 1 explains that future development plans of DPWS for 2030 include transhipments by SSS to reach 20 per cent and by rail - 40 per cent which is a significant growth of rail and SSS transportations (Expert 1, Interview 1). This will not only reduce road congestion from the UK motorways connecting Southampton to the rest of UK, but also will decrease the total carbon footprint in supply chains going through DPWS. Respectively, the previously discussed PCL model is a way to considerably reduce the load of road transport in terminal transhipments.
6.4.3.1 **Feeder (SSS) network improvements**

According to Expert’s 1 opinion, big liner operators could be attracted by strong feeder networks. Therefore, it is vital for DPWS to grow as a major hub with good SSS connection. Moreover, Expert 1 expects demand for feeder service in Southampton to continue to grow. In 2006, feeders accounted for 5 per cent of all terminal transhipments, whereas in 2010 their number grew to 9 per cent (Expert 1, Interview 3). Feeder services in the UK are seen as an alternative to the congested road links. Speed of some deliveries is not so important and shippers begin to recognize the benefits related to SSS. Consequently, the terminal has made several important steps:

6.4.3.1.1 **Establishment of dedicated feeder berth**

In the period between 2003 and 2007, DPWS has not kept good relationship with its feeder partners. Big vessels were usually given priority and most of the feeder operators abandoned Southampton as their port of call (van Marle, 2011c). Accordingly, to enhance their feeder network DPWS has introduced a dedicated feeder berth in the end of 2007. The establishment of special facility for feeders clearly states that DPWS has changed attitude towards this way of transportation. The berth was equipped with a mobile crane capable of lifting 100 tonnes and a special feeder stack was provided. Expert 1 explains that these steps have considerably increased productivity and turn-around time of feeder vessels. However, as far as size of feeders is concerned, Expert 1 has seen feeders as well as big industry vessels to grow in size for the last couple of years. (Expert 1, Interview 3). Looking at the future, this industry trend may proved to be serious challenge because the dedicated feeder berth has a depth of 9.1 metres and is only 150 metres long.

6.4.3.1.2 **Effective marketing**

DPWS has been very active in its marketing campaign. As Expert 1 says, the terminal is makes clear to its customers the benefits related to feeder and SSS transport as an alternative of congested UK roads and motorways. The UK has a unique port infrastructure linking most of parts of the country. Also, SSS provides lower carbon footprint of the transported goods. This is really important with relation to the increasing public environmental concerns and may prove to be a crucial factor for selection of transport mode in the future (Section 3). Moreover, feeder shipping provides more energy efficient transportation hence reducing the total transportation costs (Expert 1, Interview 3).
The aftermaths of these solutions have been an immediate increase of speed of feeder transhipments and vessel turn-around time; and a success of marketing strategy in boosting the demand for SSS service (Expert 1, Interview 3).

6.4.3.2 Rail network improvements

The demand for rail services has increased in the recent years. There are three major factors contributing to this change - road congestions, government's support and lower costs for transportation. To reduce the total carbon emissions the UK government has decided to provide financial incentives for every container transported by rail. Also, usually one train composition consists of 60 containers thus reducing road haulage and traffic congestions (Expert 3, Interview 4).

The rail infrastructure of DPWS is considered to be terminal's most significant advantage. (Expert 1, Interview 1). Therefore, to meet the current demand and expectation of its rail logistics providers and their customers, the terminal should invest in development of its rail network. Moreover, as already stated, DPWS is planning to reach 40 per cent in rail transhipments in 2030. According to Expert 3, the terminal will be able to achieve this target but drastic changes in management should be made (Expert 3, Interview 4).

6.4.3.2.1 Redevelopment of Southampton Nuneaton railway

The redevelopment of Southampton-Nuneaton rail line (Figure 6.5) was completed in March 2011 enabling the transportation of high-cube container (HCC) on normal regular sized wagons instead of node pocket wagons. The project involves 53 structures - bridges, tunnels, station platforms, all of which had to be knocked down or deepen. Expert 1 states that this redevelopment has significantly increased the effectiveness of rail transhipments. Expert 3 explains that redevelopment has improved the capacity of HCC transported by rail by approximately 25 per cent. The upgrade has already boosted rail demands (reach 29 per cent) and it is estimated that this project will contribute to the reduction of 15,000 truck journeys per year. Moreover, the upgrade of the rail line has removed the previously established restrictions on the number of wagons. As a result, DB Schenker has increased the number of wagons on each train by six (Expert 1, Interview 1; Expert 3; Interview 4). However, additional charge of GBP 3.00 per loaded import container has been introduced in DPWS to recover the costs incurred during the rail gauge clearance project (Figure 6.5) (van Marle, 2010).
As it was previously discussed, DPWS has identified 40 per cent rail transhipments for 2030. 18 per cent of the current transhipments go through the dedicated Freightliner’s Maritime terminal. Expert 1 explains that in 2012 Freightliner are going to replace the old 40 years slow gantry crane with two more advanced and up-to-date ones. As a result capacity will be boosted instantly (Expert 1, Interview 1). This change will considerably increase the speed of loading/unloading of containers on wagons thus increasing load of rail transhipments per day.

However, with regard to the management and organisation of rail transhipments in the terminal, Expert 3 has noticed a significant inefficiency. Since DB Schenker Rail terminal is located in significant distance from the port the company is using the service of Pentalver (road logistic provider). Also DB Schenker does not have dedicated stack in the terminal. As a result the company is facing these two issues:

- **No dedicated transfer areas for rail operators** - the terminal currently offers a pre-gate facility and three transfer areas for trucks. This means that any container arriving/departing by rail need to join the back of the haulage queues in the three transfer areas. Expert 3 proposes the establishment of a special facility for all rail operators so as to be able to apply for their containers separately from the haulers. Respectively, Expert 3 recommends the formation of a second line in each transfer areas dedicated to rail operators (Expert 3, interview 4).

- **Short dwell time** - another challenge for rail operators is the fact that the dwell time for rail containers is one day, whereas that for containers distributed by road is three days.
Rail operators demand the same time window for picking up their container in order to plan more efficient operations (Expert 3, Interview 4). Still, for terminal limited in its stowage capacity, dwell time for rail containers is not likely to be changed in the future.

The other rail operator Freightliner has dedicated stack for their operations in the terminal — "Victor stack". The stack contains all containers prior to requirement or distribution. According to Expert 3, it takes approximately 5 minutes for the container to be distributed from the quay (Victor stack) to their operational yard (Expert 3, Interview 4). Thus, the establishment of dedicated stack has considerably increased the speed of Freightliner’s service. However, when redevelopment of 201 and 202 berths begins, the Victor stack will no longer be available. The containers will not be in the centre of the quay and will take additional straddle carrier to transport them to the yard. Expert 3 considers that DPWS is not ready to make such investment (Expert 3, Interview 4). Therefore, a possible decrease in efficiency could be expected with regard to Freightliner operations. This will have a negative impact on the total percentage of transported containers.

6.5 The fierce UK port competition

To evaluate the competitiveness of DPWS, a SWOT analysis will be applied. However, the analysis will focus on the internal factors (strengths and weaknesses) rather than the external ones (opportunities and threats) because the internal factors can be affected by strategic decisions of DPWS. The market opportunities and threats have already been discussed and identified in the PESTLE analysis (Section 3). DPWS determines terminal’s source of competitive advantage which the company should use in order to gain market advantage over its main rivals. Furthermore, DPWS’s weaknesses will also be studied and possible solution to limit them should be proposed.

6.5.1 Strengths

6.5.1.1 The superior connectivity in marine networks

DPWS is located closer than any other port in Northern Europe to the Asia-Europe trade route. According to all Experts this is the most important factor for selection of the terminal. This could be a key factor in the development of DPWS as a major European hub.

6.5.1.2 Excellent road, rail and SSS connections allowing fast transhipments.

• Road — Excellent road connections such as M3, A34 and M40 provide faster lorry transportation to Midlands in comparison with the already congested M25. Moreover,
distances to average destinations are 15 miles less than Felixstowe and 20 miles less than Thamesport (Expert 1, Interview 3; DPWS online, 2011).

- **Rail** – the well-developed rail network that connects DPWS to major markets such as Midlands and further north to Manchester, Liverpool and Glasgow. The recent gauge clearance of Southampton-Nuneaton railway allows DPWS to transport 9'6" (HCC) on standard freight wagons which additionally improve effectiveness of rail transport (Expert 1; Interview 3).

- **SSS** – DPWS has fast feeder connections with UK East and West Coast, Scandinavia and Western Europe. The company fastest transit time from SE Asia to Gothenburg is 5 days but also the fastest transhipments to the USA - New York 7-8 days, which is quicker even than transhipments through Liverpool (Expert 1, Interview 3).

To make a comparison between DPWS and its main rival Felixstowe, containers going to Midlands from DPWS usually are 25 per cent faster than those coming from Felixstowe (Expert 1, Interview 3).

### 6.5.1.3 Reliable nautical access

The port has a unique double tide - 17 hours out of every 24 hours of high or rising water. Also, due to the location of the terminal its operations are rarely affected by the weather. Additionally, the DPWS has an average depth of 14.0 metres alongside or 80 per cent of its berths, and the future depth of the reconstructed berth is planned to be 16 metres (Expert 2; Interview 2; DPWS presentation, 2011).

### 6.5.1.4 Good environment policy

Currently the company is not planning to introduce any incentives for ‘greener’ vessels. DPWS current environmental policy focuses on reduction of carbon footprint related to internal stevedoring, stacking and transhipment operations. For instance, the straddle carriers ‘dual cycling’ has reduced unproductive gantry moves and decreased empty trips of horizontal transfer equipment, thus creating more energy efficient and eco-friendly crane and straddle carriers operations. Furthermore, DPWS has invested in new more sufficient equipment. According to Expert 1, in 2009 the terminal introduced two Kalmar Hybrid Straddle Carriers which can provide 25-30% fuel savings and reduce CO₂ emissions by 50 tonnes per straddle carrier per year (Expert 1, Interview 3).

### 6.5.1.5 Sophisticated ICS and IT systems
DPWS introduced the first vehicle booking system (VBS) in Europe in 2006, which currently the terminal continues to improve. As a result, average turnaround time for trucks has become 30 minutes. Moreover DPWS operates with two state-of-the-art ICS systems: Navis Sparcs and CNS Compass (Expert 1, Interview 3). These systems allow 24/7 visibility over the terminal operations and provide easy accessible, accurate and reliable information thus contributing to supply chain collaboration. Moreover, Navis Sparcs and CNS Compass enhance the transport operation performed by DPWS customers and bring value to the whole supply chain.

6.5.1.6 Comprehensive Marketing strategy

According to Expert 1, DPWS marketing strategy includes going beyond company’s direct customers (liner companies; logistics providers) to other partners in the supply chain (retailers; manufacturers; end-customers). DPWS informs all of its business partners about the current activities/operations provided in the terminal but also shares information about terminal’s future plans for improvement and development. Thus, the company makes its decisions with regards to the entire supply chain environment (Expert 1, Interview 3).

6.5.2 Weaknesses

6.5.2.1 Limited in ability to grow

Terminal expansions are limited because of the high price of land, environmental concerns, and low availability of free space area. As a result DPWS has decided to optimise the use of terminal land in order to increase terminal capacity.

- The terminal has adopted the most sophisticated TOS – Navis Sprarcs. The system possesses a function called ‘Expert Decking’. This feature helps space-constrained terminals, such as DPWS, to increase utilisation of yard space in order to handle growth without adding new land.
- The container dwell time in DPWS has been decreased to three days for road logistic providers and only one day for rail providers (Expert 3, Interview 4). Respectively, the dwell time is a measurement for the free days that a laden container can spend in the port before storage fee to be incurred. The dwell time commences after container touches the quay. This decision has considerably reduced terminal congestions and increased the capacity of storage yards. However, although the reduction of dwell time solved the problems with capacity, it has created new issues for logistics providers related to laden container distribution transportation.
• Future plans for optimisation of terminal yard capacity also include the repositioning of the Main office building, alongside with the Engineering shop and the Straddle park, in order to free 18 acres which will be used for additional container stowage capacity (Expert 1, Interview 1)

6.5.2.2 Approaching channel depth

Although the port possesses reliable nautical access the depth of the approaching channel remains a key issue. This year the average depth of the deep-sea container berths of the terminal has become 14.0 metres as a result from the dredging works. However, the approach channel to the port of Southampton has a depth of 12.6 metres. Although, ABP Southampton has submitted a plan for the dredging of the channel to MMO two and a half years ago, so far environmental clearance has not been received (Expert 1, Interview 3).

6.5.2.3 Lack of logistics activities

DPWS does not possess any trucks and does not provide any logistics activities. However, one of the main competitors of DPWS – Felixstowe - has been a big centre for PCL. Accordingly, the terminal has decided to follow different strategy for development and has focused on its core activities (fast stevedoring and transhipment operations), while allowing Import Service Ltd. to provide port-centric logistic (PCL) solutions in the port (Expert 1, Interview 3). Therefore, DPWS has compensated for the lack of logistics activities by keeping close business relationship with its partners from Import service.

6.5.2.4 Existence of higher tariffs than Felixstowe and Themesport

Following a comparison of the port tariff information posted on ports web based portal, it has been concluded that DPWS possesses the highest tariff among all three ports.
Summary of the SWOT analysis is given in Table 6.1.

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Opportunities</th>
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<tr>
<td>• Superior connectivity in marine networks</td>
<td>• Supportive national policy</td>
</tr>
<tr>
<td>• Excellent rail, road and SSS connections</td>
<td>• Increase in imports of containerised goods</td>
</tr>
<tr>
<td>(25 per cent faster transhipments than Felixstowe)</td>
<td>• Increase in demand due to population growth</td>
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<tr>
<td>• Reliable nautical access</td>
<td>• Development of PCL in the UK</td>
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<td>• Good environmental policy</td>
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<td>• Sophisticated ICS, TOS and IT systems</td>
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<td>• Comprehensive marketing strategy</td>
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<tr>
<td>Weaknesses</td>
<td>Threads</td>
</tr>
<tr>
<td>• Limited in its physical capacity to grow</td>
<td>• Increased size of vessels</td>
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<tr>
<td>• Absence of logistics activities</td>
<td>• Possible second wave of recession</td>
</tr>
<tr>
<td>• Approaching channel depth</td>
<td>• Development of London Gateway</td>
</tr>
<tr>
<td>• Higher tariffs than Felixstowe and Themeport</td>
<td>• Felixstowe South’s deep-sea berth expansion</td>
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<tr>
<td>• Increasing bargaining power of port clients</td>
<td>• Increasing environmental concerns</td>
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<tr>
<td>• Rising environmental concerns</td>
<td>• Need for constant investments in dredging</td>
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<td>• Reliable nautical access</td>
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<td>• Comprehensive marketing strategy</td>
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7 SECTION 7 – Conclusions and recommendations

7.1 Conclusions

The present study attempted to investigate the current market challenges for DPWS and to analyse the company’s adopted solutions. The investigation shows that major changes have occurred in the market environment in which UK container ports and terminals operate. Also, key transformations have happened in maritime and port sector. These market and industry changes have generated fundamental challenges for DPWS. The findings of this case study have proven that DPWS has developed acceptable and workable solutions to address them. The challenges and strategic solutions are listed bellow:

7.1.1 Accommodate large port clients

The shipping companies and alliances currently operating in DPWS have begun deploying bigger vessels on their sailing destinations in order to take advantage of economies of scale. Consequently, DPWS has been transformed from four-berth container terminal into three berth container terminal thus reducing DPWS’s deep-sea berthing capacity by 25 per cent. Thus, the terminal is facing high risk of losing important client or whole alliance because of terminal congestions. Terminal expansion is not currently possible and to address this challenge DPWS has decided to redevelop 201 and 202 berths into deep-sea container berth capable of accommodating the biggest vessels in the industry Maersk Triple E-class. For the evaluation of this strategic solution port development model has been applied. The results show that DPWS reconstruction is well-grounded since all components of the model have been contented. Furthermore, the company also performed dredging operations to increase the average depth its operational berths to 14.0 metres.

7.1.2 Raise terminal efficiency

Larger vessels have provided larger volumes of containers per turn. Vessel turn-around time is essential for shipping companies since vessel time spend in port is considered to be a negative return. Therefore, to respond to this challenge DPWS has adopted the following strategic solutions:
DPWS has adopted straddle carrier ‘dual cycling’ which has reduced unproductive/empty gantry moves and decreased empty trips of horizontal transfer equipment. This considerably increased shipside productivity.

DPWS has divided the terminal into three operational areas which allowed straddle carrier to make short runs, respectively increased their productivity.

7.1.3 Address the challenges related to slow steaming

Shipping companies operating in the port has adopted ‘slow steaming’ as a major corporate strategy to reduce bunker costs and to control slot capacity. ‘Slow steaming’ combined with seasonal congestion in Asia creates major disturbances in the DPWS schedules. To tackle this challenge the company relies on its up-to-date ICS to provide reliable information sharing with its business partners. Thus, the company is able quickly to respond to any changes in the sailing schedules of shipping companies hence to reorganise its operations.

7.1.4 Provide sophisticated ICS systems

The provision of a sophisticated system is not only a requirement for successful TESCI but also is necessarily for efficient terminal operations. To respond to this challenge the company offers two state-of-the-art ICS systems – Navis Sparcs and CNS Compass. Both systems are highly valued by DPWS customers because they provide 24/7 visibility over terminal operations as well as accurate and reliable. This fact considerably increases operational efficiency of terminal customer and adds value to their customers.

7.1.5 Offer value added services

Value added services are recognised as a way to attract new business. However, DPWS is limited in its ability to expand and the company is concentrated on its core activities – fast stevedoring and transhipment operations. To confront this challenge DPWS keeps close business relationship with Import Service Ltd., logistics company providing port centric solutions in the terminal. Thus, DPWS is able to enhance its competitiveness and stay attractive on the market.
7.1.6 Increase the efficiency of feeder operations

Strong feeder networks are the key condition to attract big liner operators. To respond to this, DPWS has created dedicated feeder berth in the terminal which considerably increased the operational efficiency of SSS transhipments – for only three years the percentage of containers transhipped by sea raised from 5 to 9 per cent (135,000 TEU).

7.1.7 Increase the efficiency of rail operations

The development of the rail network has become main objective for the company in order to reduce the load of road transhipments. To address that issue Southampton-Nuneaton railway has been redeveloped so as HCC to be transported on normal sized wagons. This strategic step has increased the size of rail transhipment from 25 to 27 per cent as company is expecting to reach 31 per cent by the of the year (465,000 TEU)

7.2 Recommendations

7.2.1 Repositioning of the Main office, the Engineering and the Straddle park

DPWS should reposition the Main office building, alongside with the Engineering shop and the Straddle carrier park. Consequently, approximately 18 acres of land would be freed and could be used for additional container stowage capacity. Thus, the terminal would be able to develop in the limits of its own available resources and would overcome difficulties related to the low availability of land for terminal expansion in the area. Moreover, the ‘18 acres’ are located in a close proximity to the Central operational area and could easily be transformed into additional capacity to it. Therefore, such redevelopment would not affect by any means the terminal efficiency but will prove to be boost for DPWS capacity.

7.2.2 Dedicated stack for all rail logistics operators

DPWS should reconsider the development of a new stack which could service both logistic operators in the terminal. Such dedicated stack would considerably improve DB Schenker and Freightliner efficiency hence it would strongly contribute to the planned target of 40 per cent rail transhipments in 2030. Moreover, the ‘dedicated stack’ would eliminate the issues related to absence of transfer area for rail operators. However, for the implementation of this recommendation additional area of land in the terminal should be provided. Still, DPWS
promotes the growth of rail transhipment as a main priority for future development. Consequently, the terminal should be ready to decrease part of its stacking capacity in order to ensure more effective and efficient rail operations.

7.2.3 Redevelopment of 201 and 202 berths

DPWS should commence the reconstruction of 201 and 202 berths that is expected to take approximately two years to be completed. Therefore, the company should take advantage of the current container market decline in order to make investments now. That would ensure the beginning of investments return at a moment when the market will be in a growing trend. Moreover, the container shipping industry is growing in size and DPWS should not risk losing market share to its main rivals (Felixstowe and London Gateway) due to a lack of berthing capacity for large industry vessels. Unlike the Dibden project, environmental concerns are no longer barrier for implementation of the berths redevelopment because the company has already received environmental clearance from MMO.

7.2.4 Deepening of the approaching channel

DPWS, and especially ABP, should be more active in their struggle to get environmental clearance for the dredging operations in the approaching channel. Even if the company has invested in dredging its terminal berthing infrastructure, the insufficient channel depth would result in inability to accommodate big industry vessels. Consequently, DPWS takes a risk to lose a large industry which would affect company's profitability and growth. Environmentalist and social organisations should be convinced of the importance of dredging of the channel for the development of port of Southampton, hence for the economic prosperity of the whole region.
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9 ANNEX I

Primary research – Interviews

1. First Interview with Neil Fletcher, Senior Account Manager DP World Southampton
2. Interview with an expert from Import Services Ltd.
3. Second Interview with Mr. Neil Fletcher
4. Interview with Mandy Atherton, DB Schenker

Interview 1 Mr. Neil Fletcher DP World Southampton

1. What are the present resources available for the terminal operation berths, yard, equipment, manpower, landside operation, marine operation?

   Answer: There are 12 container cranes, six of which among the biggest in the world - 22 container wide; 1.5 km of straight-line quay of various depths 15m, 14.6m, 14.0m and 13.6m depending on the berth available at DPWS. We can accommodate three 350 metres vessels at any time. There is a specially dedicated feeder berth where a mobile crane operates can accommodate feeders up to 150 metres. Also, there are over 100 straddle carriers, 6 sprinter carriers, 8 empty container handlers, and a fleet of small vehicles on a 24/7 and 365 days per annum basis.

2. Industry researchers argue that ports contribute to supply chain either through the creation of competitive advantage or through value added delivery. Please describe, what value added activities are currently provided by the DP World Southampton?

   A2: DP World Southampton, as a container terminal, is limited to its extra activities. We just take the boxes of the ships, stock them and put them on trains or trucks. We do not have any warehouses, or container freight stations. We do not own any trucks, so we do not do any extra logistics activities. We just do the basic stevedoring operations. We do some project cargoes which our customers require.
but we stick to our core activities – take the containers from ships and put them on trucks or trains.

3. **If you are not providing any additional logistics activities, how does your organisation provide competitive advantage to your customers?**

   A3: Our organization is very conscious that we are operating in the era of just-in-time delivery. End-customers of liner shipping companies and logistics providers require very stringent delivery times. We understand that speed of terminal operations is essential criteria for section of a container terminal by the liner companies. For that reason in November 2010, we conducted our first customer satisfaction survey with our shipping clients (A permission was given to the researcher to use the results). Furthermore, DP World Southampton keeps close relationship with the end-customers. Main retailers and importers such as ASDA and Next are asked to evaluate our service. This includes identification of the current issues and the areas for improvement.

4. **Please describe, what kind of functional improvements you are planning to implement in order to facilitate higher efficiency of your core activities?**

   A4: We have taken the opportunity to purchase brand new gantry cranes this year (Y2011) and we have done a lot of civil work from the quay. Our improvement is to be the best of what we do BUT stick to our core activities – which is just the stevedoring operations. We are investing a lot of time, money and people in improving our operations. We are interested in growing our feeder network that goes both within the UK and round Western Europe. For example, we have four feeder ships a week that go to Ireland (Cork, Dublin, Belfast), West Coast of Scotland, North West of England (Liverpool), Scandinavia as well as to Rotterdam and Antwerp. We see that part of the business growing hugely over the years so we have invested a lot in that. We believe that UK South – East and South West Short Sea Shipping corridors are the way forward in order to remove the freight from the road to the sea. Also we have been investing in the rail network as well because we have just completed a project to upgrade the rail line from Southampton to Nuneaton which is south of Birmingham to enable high-cube
containers to travel on normal regular sized rail-wagons. That involves 53 structures – bridges, tunnels, station platforms all of which must be knocked down or deepen, so that these HC containers can go on regular wagons instead of these node pocket wagons. This project was funded by various organizations – Department of transport, Network rail, SE England development association, West-Midlands development association and ABP. This is estimated to take roughly 15000 truck journeys a year off the road. So, DP World Southampton is promoting the movement of containers by sea and by road.

5. **What percentage of all container throughputs you expect to be handled by rail this year?**

A5: With the completion of Southampton – Nuneaton project in March 2011 (project took two years to be completed) we expect the percentage of containers handled by rail to reach 31% by the end of this year.

6. **For years Import service ltd. has promoted port-centric logistic services in the port of Southampton. Please explain what service they require from DP World Southampton.**

A6: Import Service Ltd. is really one of the pioneers of PCL in Southampton. The company is currently operating three warehouse, one of which a 170000 m3 is located in close proximity to the terminal. Our commitment to them is to provide the required containers on time in order to ensure the reliability of their own service.

7. **Please give your opinion if there is an area for further development of PCL services in port of Southampton?**

A7: DP World Southampton is always looking at new ways to attract customers and enhance our customers business and certainly PCL is one of them. In contrast with Felixtowe and Teesport, port of Southampton has never been a big centre for PCL. However, we are looking for opportunities with our business partners from Import services to see if we could move PCL further ahead.
8. Please explain to what scope of customers and commodities PCL could be additionally developed in DP World Southampton?

A8: Recently I have attended to a conference where a logistics strategy manager from Marks & Spencer evaluated the scope of PCL. His conclusions were that the model is applicable only to certain commodities and could not be an answer to everything. Moreover, the fact that 80% of all warehouses and DCs in the UK are located in Midlands means that it would be very difficult to change the current distribution practices. However, I agree that for a certain types of goods it could be very useful.

9. Since PCL in not the case at the moment, where do you plan to expand your service?

A9: We have got a lot of potential to grow by rail transportation in the port. Our competitive advantage is our spare capacity in train paths. Every train needs to have a path in order to leave/arrive at the port Southampton. More paths will allow our rail providers to handle more than one train simultaneously. Thus, increasing the efficiency of the gantry cranes near the train paths. Also, our partners of Freightliner have decided to replace the two old gantry cranes with new ones. We expect this strategic move to enhance capacity instantly and to improve the speed of performed rail transhipments.


A9: The future plans for the port include:

a) Repositioning of the main office building; the engineering workshop; the straddle park in order to use these 18 acres for additional container stowage capacity.

- This is the yard, the container yard. There are 85 hectares. This is the office where we are right now. So if you have a look at the design of the way that it
is planned, basically this is prime stacking area in which you can’t put container to. So our plan for the future, the next 3-4 years, is to reposition this building alongside with the engineering shop and the straddle park in order to use these 18 acres for additional container stowage capacity.

- When we started this business 40 years ago the location for the main building was perfect. However, we gradually grabbed these small bits of land and grown, over thirty nearly forty years next year, into this operational configuration which is not of a really good shape.

b) Reconstruction of berth number 201 and 202 and deployment of six state-of-the-art gantry cranes in order to accommodate super post-panamax and ULCV class container ships.

c) The operations for exchange of laden containers we do by straddle carriers located in three strategic transfer areas East, Central and West. As a result, our straddle carries avoid doing long runs. Thus, short straddle runs increase the efficiency of our operations.
Interview 2 - an expert from Import Services Ltd (Expert 2).

1. Would you please share your designation in Import Service Ltd.?

Answer: I am a sales manager in Import Service Ltd. My professional responsibilities include market research and looking for potential new business opportunities. I maintain a special database of informational prospects of clients. My job overall is to try and improve our sales and marketing pipeline.

2. Port-centric logistics (PCL) has become a seriously discussed industry topic. According to your professional knowledge and experience, how demand for port-centric logistics has changed in the past years?

A2: According to my evaluation, the demand for port-centric logistics solutions and services is increasing. More companies are becoming aware of the benefits of port-centric logistics. According to Mike Thomas, our client service director, PCL improves the speed to market of fast moving products by removing regional distribution centres hence cutting out the middle man. Also, PCL helps our customer to meet their objectives by reducing road miles, accordingly, reducing carbon emissions and cutting down on road congestion. Consequently, they are reconsidering their distribution practices and seek logistic companies which are able to provide port-based distribution.

3. What kind of factors have contributed to the selection of port of Southampton for development of your port-based distribution?

A3: The seaport of Southampton is geographically located in the closest proximity to the major Far East – Europe and Southeast Asia – Europe trade routes. Also, the port has unique tide conditions and depth that allows the bigger industry vessels to operate. As a result, Southampton has become first port of call for many of the big vessels coming from Asia. Thus, our company is capable of providing service not only to the UK market but also to parts of Europe. The port also has very good
road and rail links. These excellent connections enable us to deliver our service directly to retailers’ warehouses, high-street stores and people’s homes.

4. To be able to provide this timely and high quality operations to your customers, as a major logistics company, what kind of services do you require from a modern container terminal as DP World Southampton?

A4: We understand that a good business relationship with DP World Southampton is essential for our operations. One our main requirement is a fast turn-around time of unloading a container ship (quick stevedoring operations) hence making loaded containers available quickly. Also, another important obligation is information sharing. We want accurate information in terms of where the containers are; when they have been unloaded; what the schedules are etc. In regards to that we expect DP World Southampton (DPWS) to have very good state of the art data sharing systems. Sophisticated information systems will not only increase DPWS operational efficiency but will also allow us to have visibility along with them (quick and reliable access to information).

5. In what areas can DP World Southampton improve in order to provide better service? Are there any reoccurring inefficiencies that you routinely come across and you would like to see improved?

A5: We are constantly working with DPWS in order to prevent and eliminate inefficiencies. Employees from our operational department have recently met representatives from DPWS as part of our on-going education and training program. Although in our feedback we can’t point out any significant inefficiencies, we expect from DPWS to continue improving in the areas we find particularly important for the efficiency of our operations. These areas include: sophisticated and accurate information sharing; fast turn-around of containers and reduction in waiting time when it is possible; access to systems allowing us to have the visibility that we need to trace vehicles, loads and containers to make our operations as efficient as possible.
6. You have mentioned a couple of times the importance of accurate information and information sharing. What information sharing system do you use with DPWS? Is there an area for improvement?

**A6:** We currently have access to a system called Navis SPARCS. Unfortunately, I can’t give you any evaluation since I have not worked with it. However, managers from our operations department estimate highly SPARCS because it helps reducing waiting times and improves turn-around times.

7. In June this year DP World Southampton introduced a new GPS system for container stacking and tracking to increase the swiftness of terminal operations. Could this GPS system also add value to your operations in terms of speed?

**A7:** Yes, it has. As I have mentioned, our organisation wants DPWS to continue improving their provided services. The new positioning system has improved our operations in terms of speed because we get the freight more quickly. As a result, we are able to provide excellent performance to our customers in order to keep their satisfaction high.

8. What are the opportunities for future growth of port-centric logistics in the port of Southampton?

**A8:** We see a lot of business opportunities for future growth of PCL in the port of Southampton. Currently we are actively explaining and providing information to our prospective customers about the advantages and benefits related to port-based transportation. We believe that by using port-based distribution facilities, these customers can avoid the additional costs involved in the transportation of their products to Midland or Northern DC. Also, PCL allows the cargoes to be delivered faster and straight to the final customer. This is an opportunity for our potential customers to apply the pull principle in logistics and is also an opportunity to create derived demand.
9. Industry experts and researcher have identified the key interests, related to heavy investments in inland distribution centres (Midlands), and the low-availability of land as major obstacles for development of PCL in the South England. Do you agree with this statement? What are the other obstacles for development of PCL in the port of Southampton?

9A: Our organisation does not consider these factors to be major difficulties to the development of PCL. It is well known fact that in the past the Midlands warehousing facilities were developed because of some key reasons related to land pricing; employment cost; strategic position to manufacturing areas in the UK. But all this has changed due to new demand patterns in the UK and increased cost of truck transportation. Products are distributed from major ports to Midlands and from there redistributed to the final customers. We consider this unnecessary leg in the transport chain and see port-distribution centres as the way to go.

10. PCL has traditionally been related only to big retailers. Currently, what is the scope of customers that PCL can be applied to?

A10: We are working closely with different retailers but we are also related to manufacturers as well. The customers of many of our manufacturers are major retailers. Even if we are working directly with the manufacturers in the end we deliver the manufactured products to the big retailers such as ASDA, ToysRus, Marks and Spencer etc. As a result, the scope of customers using PCL is increasing.

11. What is the range of containerised commodities your company is applying PCL to?

A11: Some of the products that we handle include toys, gifts, sports equipment. Most of them are manufactured goods coming from Far East and Southeast Asia which we deliver directly to retailers.

12. How can port-centric logistics services in Southampton benefit deep-sea container shipping lines calling at the port?
A12: I think the most significant benefit for these container lines is related to demand. Today's competition is competition between supply chains. Therefore, if a supply chain is faster, cheaper and more efficient - more companies are going to use it, respectively to use the ocean freight service and the routes to Southampton.

13. Could PCL be a decisive factor for port/container terminal selection in the future and why?

A13: Yes, according to me, PCL would definitely be a decisive factor. The main reasons for that are the many benefits we have already discussed - PCL makes the supply chain more efficient in terms of speed and cost; eliminate unnecessary legs in the transportation process; reduce pollution and allow customers to use to full extend the pull principle in logistics. A counter argument for the development of PCL may be a company (manufacturer) with a particular inbound of goods from different supply chains going through different ports. If the final product itself requires consolidation before final distribution, then this fact may be a serious obstacle for this company to adopt the principles of PCL for this particular product. However, for organisations importing manufactured products PCL could be a source of competitive advantage.

14. Looking at the future, in what direction do you see port-centric logistics service in terms of demand?

A14: The demand for port-centric logistics service definitely will increase as the number of companies embracing and recognising the benefits of PCL continues to grow.

Interview 3 - Neil Fletcher (Expert 1)

1. Currently, there are 44 super post-panamax carriers in service as another 113 have been ordered proving that container shipping industry is growing.
Do you consider container vessel’s size as a major factor for terminal development and why?

**Answer:** Yes, the big vessels have become a major factor in the industry. The increasing size of ships has turned Southampton from a four-berth container terminal into a three-berth container terminal. DPWS responded to that with the redevelopment of 201 and 202 berths in order to accommodate more vessels, including the giants from the Triple E-class.

2. How the demand in DP World Southampton (DPWS) for big container vessels (12000TEU +) has changed in the past years? Do you expect demand for such vessels to continue growing?

**A2:** Two years ago there was not a single new panamax class container ship or ULCV visiting the port of Southampton. Today we have at least one every seven days. My opinion is that demand for such vessels will continue to grow because more liner companies have recognised the benefits related to economies of scale.

3. The last two years have demonstrated that lines consider ‘slow steaming’ as a major cost reduction strategy. What benefits has ‘slow steaming’ brought to terminal operators?

**A3:** Actually, ‘slow steaming’ does not bring any benefits to our operations. If container vessels get delayed in China or other parts of SE Asia, like it happens now because of seasonal port congestion, they do not speed up in order to catch up with their schedule but sail using ‘slow steaming’. Thus, there are major disturbances sailing schedules which result in different operational and organisational challenges for the terminals. Possible solution may be our sophisticated ICS that allow accurate information sharing with our business partners.

4. UK government has recognised port of Southampton as one of the ten ports with significant importance to UK transport corridors (14). Various government organisations/bodies have supported the redevelopment of
Southampton-Nuneaton railroad. Are there any other projects that UK government supports your organisation for?

A4: Yes, the UK government and various government organisations provided the main investments for the Southampton-Nuneaton project. Currently, there are no projects in progress but in the future we do expect government to support the growth of the intra UK feeder network as part of the EU policy for development of short sea shipping.

5. DPWS has always been supportive to the local community. What social benefits will the container expansion bring to the Southampton community?

A5: DPWS has developed close relationship with the local community. We are involved in different charity activities and donations. Moreover, the port itself is responsible for more than 30,000 jobs in the area creating 5.5 GBP billion in domestic product. The new container berth expansion will definitely create more workplaces, not only at the port but throughout the whole intermodal supply chain. In addition to the reduced unemployment in the area, the expansion will also stimulate economic development of the whole region.

6. Apart from the Atlantic salmon migratory patterns, are there any other environmental concerns regarding the expansion of the terminal?

A6: The breeding characteristic of the Atlantic salmon is considered to be the only serious environmental concern regarding the redevelopment of berth 201 and 202. So far as noise and pollution are concerned, DPWS follows a strict environmental policy which includes the use of the most modern equipment which is much more silent and environmentally friendly.

7. Many of the port development plans supported by the UK government were based on the original MDS Transmodal 2005-2020 forecast. Recently the prediction for 2020 has been corrected resulting in only 44% of the original forecast. Ports, however, have already pushed the start button for their
development plans. Do you expect potential oversupply of terminal services in the future?

A7: Yes, taking into consideration slow demand recovery for containerised service in the UK there might an opportunity for terminal service oversupply in the future which may result in fierce competition between the major container terminals in the UK - Felixstowe, Southampton, Themesport. Felixstowe are currently developing their deep-sea terminal which is expected to be fully operational next year. Also, when completed, London Gateway project will bring additional 3.8 million TEU free capacity to the UK market. However, the first phase of the London Gateway’s dredging programme should be complete by the end of 2012, while an initial kitting out of the quayside to open a first berth would take at least another nine months after that. So, we consider the opening of the first phase at London Gateway to be possible by the end of 2013.

8. Which container terminals do you recognize as DPWS potential competitors in the UK market and why?

A8: In terms of terminal capacity, accessibility, hinterland connection and closeness to the main markets, we consider our main competitors to be the big hubs such as Felixstowe, Themesport, and in the future London Gateway. We do not recognise Bristol and Liverpool to be our market rivals since their projects are still in process of development. From the European ports we identify the big container hubs Rotterdam and Antwerp as our main competitors.

9. What marketing strategies do you use to gain business?

A9: Our marketing strategy includes going beyond our direct customers (shipping lines, logistic providers) to other stakeholders in the whole supply chain. We keep all of them informed not only on the current activities we provide in the terminal but also on our future plans for improvement and development. Thus, we listen to all of them and made our decisions with regards to the entire supply chain environment.
10. What do you think the port selection criteria of shipping companies are?

A10: Some of the liner shipping companies have become major shareholders in terminals around the world hence these terminals will always be their port of choice. However, for lines with no investments in a terminal I consider these to be the main criteria:

- Geographical location – closeness to major trading routes
- Hinterland connections – road, especially rail and feeder links
- Price of terminal services (competitive tariffs)
- Productivity (turn-around time)

11. As it is stated in your brochure “Why Southampton?, which are the sources of competitive advantage DPWS provide to its customers?

A11: First and most important factor for selection of Southampton is the geographical location of the port. Southampton is closest than any other port in Europe to the main Asia-Europe trade route. The port of Southampton also has good hinterland connection by road. M3, A34 and M40 provide faster lorry transportation to Midlands in comparison with the already congested M25. Another competitive advantage is our well-developed rail network that connects us to major markets such as Midlands and further north to Manchester, Liverpool and Glasgow. The recent redevelopment of Southampton-Nuneaton railway allows us to transport 9’6” (HC) on standard freight wagons which additionally improve effectiveness of rail transport. DPWS also has feeder connections with UK East and West Coast, Scandinavia and Western Europe. For example, thanks to our developed feeder network we are able to provide the fastest transit time from SE Asia to Gothenburg – 5 days. To make a comparison, the containers going through Southampton usually are 25% faster than those coming from Felixstowe.

12. Port of Antwerp has introduced lower charges for ‘greener’ vessels – a 10% discount on tonnage fees. Do you plan to introduce such environmental incentives for your customers?
A12: At the moment, we are not planning to introduce such environmental tax reduction. DPWS environmental policy only focuses on the reduction of our own carbon footprint. An example is the optimisation of our crane operations – dual cycling. Dual cycling not only reduces unproductive/empty gantry moves but also decreases empty trips of horizontal transfer equipment, thus creating more energy efficient and eco-friendly crane and straddle carriers operations. Furthermore, we are always looking to invest in new more sufficient equipment. In 2009, we introduced two Kalmar Hybrid Straddle Carriers which can provide 25-30% fuel savings and reduce CO2 emissions by 50 tonnes per straddle carrier per year.

13. In 2005, DPWS was the first port in Europe to introduce VBS. Information sharing and sophisticated IT systems have become key requirements for a modern container terminal. Currently DPWS is using Navis Spares and CNS Compass. How these systems have improved your operations? Do these systems add value to service quality of your customers?

A13: Automation and Information technologies have become the backbone of successful container terminal operations. In the case of DPWS, Navis Spares and CNS Compass have assisted our organisation in providing more efficient stacking operations, tracking and yard management. As a result, we have improved our shipping productivity and turn-around time. Navis Spares and CNS Compass allow our customers to have 24/7 visibility over our operations. Therefore, they are able to plan in advance and execute time and cost-efficient transport operations hence bringing value to their final customers. Accuracy and reliability of an IT system are also very important. The CNS Compass is highly valued by our customers because since it has been introduced in November 2010 there was not a single problem related to the system.

14. Recently DPWS has started providing shipping lines with information. How long it will take for a container to be discharged from a ship? Has these steps improved customers satisfaction and thereby increasing and gaining business?
A14: DPWS recognises the importance of collaboration in the era of just-in-time delivery. This information help shipping lines to plan in advance with their haulers or rail operators to arrange a more timely collection of their containers hence increasing the speed of their operation and reducing the dwell time in the terminal.

15. In Lloyd’s list you have stated that big liner operators could be attracted by strong feeder networks.
   a. How the introduction of specialized feeder berth has changed the feeder operations in DPWS?

   A15a: In the old days between 2003 and 2007 we were not very good with feeders. We have introduced the feeder berth (203) to show our short sea shipping partners that we now recognise the importance of the feeder service for the future development of DPWS as a major hub port. The dedicated berth (equipped with one mobile crane) allows us to increase shipping productivity and turn-around time.

   b. How do you see feeder service in Southampton to change in terms of demand and size?

   A15b: I expect the demand for feeder services to continue to grow. In 2006, around 5% of Southampton’s 1.5m TEU throughput was transhipment cargo, while last year that ratio rose to 9%. Feeder services in the UK are seen as an alternative to the congested road links and more shippers begin to recognise the benefits related to short sea shipping. As far as size is concerned, the last couple of years have shown that feeder vessels, as well as the deep-sea container ships, are growing bigger.

   c. As DPWS plans are to reach 20% growth in feeder transhipments, how will DPWS support further development of its feeder networks?

   A15c: We are explain to our customers the benefits related to feeder services – alternative to the congested roads, low carbon emissions, lower transportation cost. Though good planning and information sharing we managed to increase the
speed of our transhipments operations. Big vessels are berthed prior to the arrival of the feeders so that all containers for transhipment to be discharged and loaded immediately on the feeders. This allow us to provide the fastest transhipments from Asia to Norway (the already mentioned 5 day Gothenburg service) but also the fastest transhipments to the USA - New York 7-8 days, which is quicker even than transhipments through Liverpool.

16. DPWS states that improving shipside productivity (container moves/hour) is its number one objective to meet customers' satisfaction. What steps are you planning to take to achieve this goal?

A16: We have already achieved our target - average 25 container moves/hour. Also, some of our latest performance indicators show even better results – 26/27 container moves/hour. The steps we have taken include: regular strategic planning meeting with our shipping customers; well-organised operations; good internal communication in the terminal; excellent equipment maintenance; retaining of talented staff and constant training.

17. Do you expect any value added services to be provided by DPWS in the future? If yes, what services do you expect to commence? If no, why?

A17: No, we are not planning to introduce any value added services in DPWS. We are very limited in our physical ability to expand, so our strategy is to concentrate on our core activities which include fast stevedoring operations and transhipments and to provide the best service to our business partners.

18. According to you, what are the current areas for improvement in DPWS?

A18: Our previous surveys did not recognise any major inefficiency related to our operations. However, we are constantly looking for new improvements to enhance our operations and provide the best service to our clients.

19. Mearsk line has ordered 10 Triple E-class (18000TEU) vessels thus the number of containers across the weather deck will become 23 (currently, all
DPWS post-panamax cranes have an operational reach of 22). What kind of steps have you taken to prepare yourself to service these new industry giants?

A19: When Maersk Line introduced Emma Maersk in 2006, only couple of ports were able to service her. Soon, however, the benefits of economies of scale have been recognised by other companies as well. As a result, terminals around the globe needed to change their operational practices and equipment hence acting reactively. According to the Triple E-class, DPWS decided to be proactive – our container berth expansion will be provided with the latest ship-to-shore equipment thus able to accommodate the ultra large container carriers. My expectations are that 13500+TEU vessels will be the future industry workhorses on the Asia-Europe trade route.

20. Currently, DPWS is providing a minimum depth of 14,0m alongside 80% of its berths. However, the depth of the approaching channel remains at 12,6m. What is the time-frame for completion of 13,6m – 14,0m dredging of the Southampton approach channel?

A20: At present, the environmental clearance for the dredging project of the approach channel is not provided to ABP Southampton. Their struggle has been carrying on for more than two and a half years. Hopefully, the dredging will commence soon so that the project could finish by the end of 2014 when the redevelopment of 201 and 202 berth target is planned.

21. In 2010, the port of Hamburg created FTZ neutral feeder management body, which optimises feeder movements in the port. Do you plan to introduce a similar type service in the port of Southampton?

A21: The FTZ was introduced to provide information sharing and better operation planning because the port of Hamburg consists of three separate terminals. Therefore, perfect information sharing and coordination is needed between them in order to ensure smooth and efficient operations. In the case of DPWS, taking into consideration the size of the terminal, its configuration and geography, we
consider that such service is not required. Moreover our feeder stack is located in the closest proximity to our dedicated feeder berth.

22. Do you consider the high price and low availability of land as the biggest obstacles for the future terminal development of DPWS?

A22: Yes, high price and low-availability of free land in the Southampton region are recognised as major obstacles for terminal development. Furthermore, DPWS is located in densely populated district with lots of environmental protected areas.

Interview with Mandy Atherton from DB Schenker (DBSR) (Expert 3)

1. According to you, what kind of recent changes have occurred in the demand for rail logistics service in the UK? What are the major factors contributing for this change? (increasing energy and environmental concerns, road congestion, etc.)

A1: Recent changes have occurred in the demand for rail logistics services in the UK. From Southampton, a government initiative to broaden the gauge clearance (on the tunnels) means that High Cube containers 9'6" can be conveyed on normal size wagons and the heights are now non restrictive. This means that every container that is shipped into the UK, particularly Southampton on the west coast main line can now be conveyed by rail, where previously there were restrictions on the number of wagons in the UK railway network fleet which limited the numbers that could be carried. The environmental issues are also a benefit. The government encourages conveyance by rail by giving financial incentives for each container railed. This helps the rail companies’ competitiveness when quoting for new business and encourages rail over road haulage every time. The haulage is cut considerably when imagining for instance 60 x trucks parked up waiting for vehicle booking slots onto the quay, when a train can take the 60 containers in one
fell swoop. This also helps with road congestion and keeps traffic away from the ports.

2. **What kind of services is presently provided to your company by DP World Southampton?**

**A2:** DP World currently provides information as to the availability of containers to be collected ex the vessels. They provide a discharge programme so containers can be efficiently planned to services in conjunction with their discharge availability. The HMC clearances and commercial restraints are shown as cleared once available to move off the quay, which helps with the planning. Pentalver transport provides the shunting to and from the quay and they apply for VBS slots to collect the containers, which are controlled by DPWS.

3. **What are the areas DP World Southampton can improve the quality of its service provided to rail logistics companies? Are there any reoccurring inefficiencies that you have come across and want to be improved?**

**A3:** DPWS needs to seriously look at the rail network demands and with their own targets in view to increase rail transportation into the UK from 28% to 40% over the next few years, they will not be able to achieve this with the current structure they have. The quay currently offers a pre-gate facility and three transfer areas for the trucks, which means that any containers arriving and departing by rail, need to be shunted to and from the quay and have to currently join the back of the haulage queues in the 3 x transfer areas. There needs to be a facility for all rail operators to be able to apply for their containers separately to the haulers, and so a 2nd lane in each transfer area would be preferable by all rail companies.

4. **This year the upgrade of the rail line from Southampton to Nuneaton was completed, allowing high cube containers to travel on normal sized rail-wagons. How has this new line benefited your operations?**

**A4:** As per comments in (1), this has improved the HC capacity by approx 20 - 25% by rail. DBSR has increased the number of wagons on each train by 2-3, and
will increase again at the end of August 2011 by another 2-3, which then means we are at Network Rail UK maximum length train sizes, and ready for more trains per day.

5. Future plans for development of DP World Southampton include container berth expansion so that the terminal can service bigger vessels. As a rail logistic service provider, what effect do you expect this expansion will have on the demand and rail logistics operations?

A5: The development of 201 - 202 berths is a positive move, but the industry doubts it will happen in real terms. DP World has an interest also in London Gateway which is currently under development. I consider that the UK demand will be too weak in most opinions to service two UK terminals with such a close proximity. If the Southampton development goes ahead, the largest vessels can be received into this port, which would then mean that Felixstowe and London Gateway would not have the monopoly of the largest vessels and business can be increased locally. The impact of these vessels arriving will be great and the rail targets will be achieved much quicker than first anticipated. Southampton water, having 2 x double tides per day is unique and this would prove a great advantage over rival ports.

6. Currently, rail accounts for 29% of containers which go through DP World Southampton, the target for 2030 is to reach 40%.
   a. Do you think if the current rail network will be able to support this increase?
   b. What will be the challenges for your company with regards to the growth of rail logistics?
   c. What kind of service and cooperation your company will require from DP World Southampton to ensure high quality of performance?

A6a: The current rail network will be able to support the hike in UK imports, but locally, drastic changes would have to take place to enable this to be achieved.
A6b: The challenges for DBSR are already being addressed as we have grown as a logistics rail provider considerably since December 2008, and the challenges will be the same, only on a greater scale. F/liner - our competitor - have had the monopoly of the container by rail business for 40 years, so we have had to work very hard at winning the business and will continue to adopt the same principles once the UK imports hike up. The biggest challenges will be the feed from the quay to the trains and the storage space required to housekeep containers in the industry time limits that are acceptable for railing containers (to be better than the day 1 for day 3 principle that the hauliers currently work to.

A6c: All of the aforementioned points.

5. Does your company have an effective information sharing system with DP World Southampton? Is there an area for improvement in your business-to-business communication with DP World Southampton?

A7: DBSR suffers greatly compared to Freightliner. Freightliner have all their rail information (trains, no. of boxes, berth feed to and from the quay etc.,) all on the DPWS system, so DPWS can housekeep all their containers prior to requirement into VICTOR stack on the quay which is a dedicated stack for their operation. When the containers are ready for collection, the rail gates are lowered over the dock road and DPWS sprint the containers across from the quay to their yard, which takes approx 5 minutes. This stack however will no longer be in operation after the development of 201-202 berths as it will no longer be in the centre of the quay and would take additional straddle carrier running and resource to feed the operation, of which DPWS is not prepared to invest in. DBSR however has a completely different operation, and as previously mentioned, have to rely on their relationship with Pentalver to apply for VBS slots and queue up in the transfer areas. DBSR have approached DPWS and asked if their container/train information could be downloaded into the DPWS system so they can housekeep our containers into a dedicated stack area as per the Freightliner situation, but so far have been refused.
8. What are the major factors to maintain a good relationship between a rail logistic provider and a container terminal?

A8: I would like to mention some of them, for instance:

- Fairness - all rail operators should be treated fairly and equally and have a similar rail operation, which is not currently the case.
- DPWS should be receptive to new innovative ideas that the rail companies have put forward for the improvement of the efficiencies on the rail feed. Again, something DPWS is not really doing currently as they believe that they have maximised their efficiencies already (a worrying thought, bearing in mind the fact that their targets need to increase by 12%, and they claim to already be at complete maximum efficiency, means there is no opportunity to grow).
- Communication at all times, including vessel arrival and operational issues, system breakdowns, etc.,