



European Ports Research and Development

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Contents:

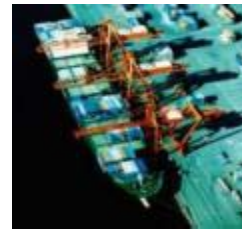
European Ports Research and Development:

- ❑ Ports Background
- ❑ Focus of Port Research & Development
- ❑ EU Research & Development Projects:
 - Tools for Port and Terminal Operators
 - Tracking and Tracing of goods and Fleet Management
 - Container management
 - Environmental projects
 - Safety and Automatic Docking
 - Port Security
- ❑ Future Research needs



Ports Background

- ❑ Seaports are the main gateways for Europe. Some 2 million vessels call each year, handle 3.5 billion tonnes of goods, over 60 million TEU containers, and 350 million passengers.
- ❑ Ports invest heavily in security measures to prevent terrorism, illegal immigration, and other criminal activity.
- ❑ The environment has become a priority for ports, and this is a significant long-term challenge for port administrations, terminal operators and transport service providers



Ports Background



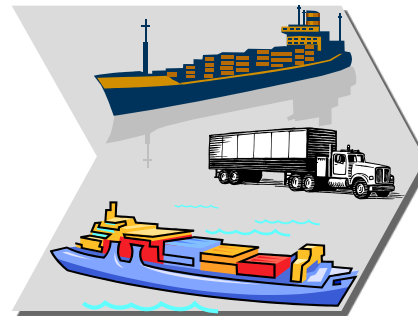
More production...



More consumption...



More economic growth



Increasing transport



...hence more port requirements

Focus of Port Research & Development:

- ❑ Over the last 10 years, EU research projects related to ports have focussed on three main areas: port management and operations, infrastructures, multi-modal traffic in port terminals. The common objective was to help achieve higher levels of efficiency.
- ❑ Research addressing existing port operations has provided important information on processes to be avoided, or how they can be improved through the application of new support technologies, such as tracking of ships and cargo, or simply in data exchanges.
- ❑ More recently, research has focussed on port security and environmental issues, including port noise and use of energy. The concept of “green ports” is also receiving more attention, together with issues of marine environment protection, global climate change and rising sea levels.



Tools for Port and Terminal Operators:

- ❑ **ASAPP ONE**, 2001 proposed a system of automated shuttles on a dedicated rail track connecting the port yard to a peripheral inland depot. The system would eliminate road traffic problems in the urban areas surrounding the ports in favour of the middle range railway transport.
- ❑ **TRAPIST**, 2004 developed tools for supporting port and terminal operators and optimising the planning, management and use of their resources. **ITIP**, 2002 supported the selection of appropriate technologies for operations
- ❑ **SECURCRANE**, 2006 involved a remote control station that allows crane operators to work in safe and comfortable positions on the ground. Computer and video screens, and audio speakers simulate the experience of being in the on-crane cabin, while the operator uses familiar controls and joysticks to grab, lift, move and release freight containers.



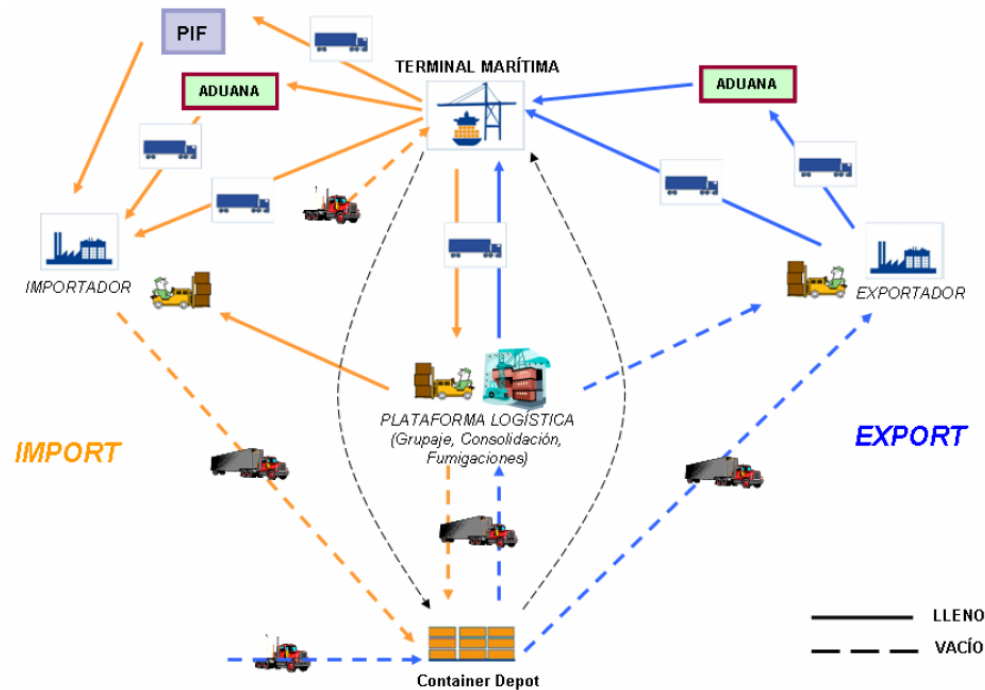
Tracking and Tracing and Fleet Management:

- ❑ **S-CBB**, 2000: Developed a secure cargo black box application, which allows tracking and tracing of vessels at all times
- ❑ **CESAR II**, 2003: Established a common and harmonised tracking and tracing system, characterised by interoperability, open interfaces, and standardisation
ParcelCall, 2002,
- ❑ **MOCONT II**, 2003: Developed and tested a system in field-trials to automatically track the containers inside a terminal
- ❑ **iBoS**, 2004: Research to increase the transparency of information in the logistic chain of perishable goods



Container management:

- ❑ **FLAGSHIP, 2007:** Developed container stock optimisation in terminals and depots, reducing the number of wasted movements, smoothing of traffic/activity in the terminal, and import/export pairing.
- ❑ The benefits include 20-25% reduction of container handling operations in terminal, a 20-25% reduction in traffic in the vicinity of the terminal, and 6-8% cost saving .



Environmental projects:

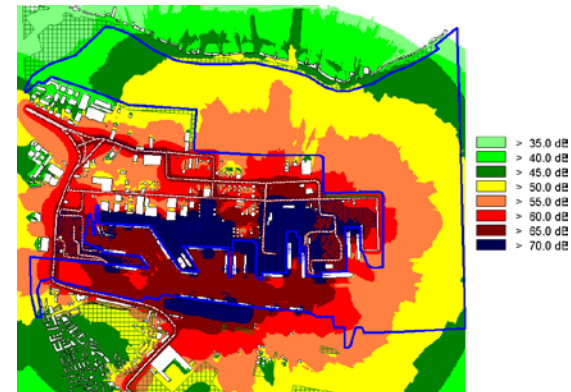
- ❑ **ECOPORTS**, 2002: Focused on the development and implementation of tools to improve the environmental performance of ports. It created a European 'ports & environment' network, involving all major European seaports and inland ports.
- ❑ **NoMEPorts**, 2005: Aimed at noise reduction, noise-related annoyance and health problems of people living around port industrial areas. A noise mapping and management system was demonstrated making use of a noise database developed in the EU projects **HARMONOISE** and **IMAGINE**.
- ❑ **LHEON**, 2002: Aimed at understanding how Ports were evolving and how Earth Observation (EO) data can respond to their monitoring needs. LHEON is part of the market development study department at ESA, which aims to foster the development of operational environmental information services at a European and Global level.
- ❑ **ECONET**, 2004: Focused on the exchange and implementation of best practices in European ports.



Environmental issues:

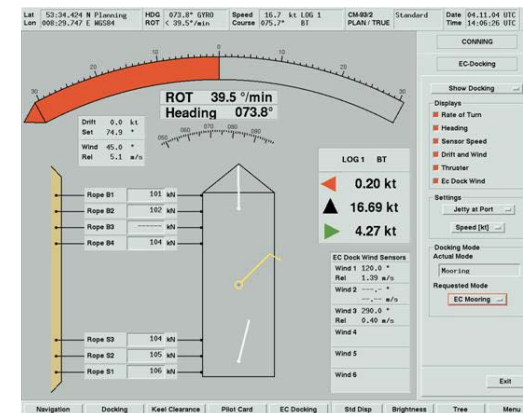
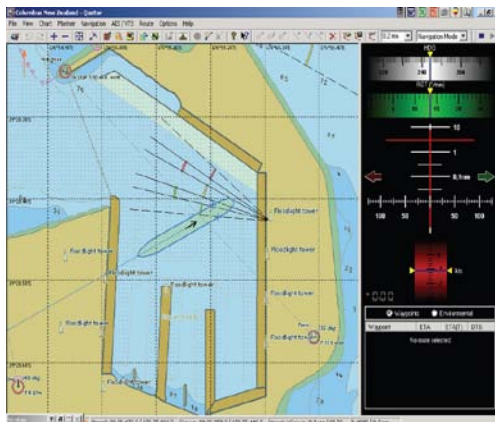


- ❑ **EFFORTS, 2007:** Addressed port organisation and strategic planning, ports and the environment, and navigation in ports. The overall objective was to improve competitiveness and market performance of European ports, and better port labour and environmental conditions.
- ❑ Research topics included Noise Annoyance of Ports, a decision support tool for clean energy management, and the development of an independent “Portable Pilot Unit” navigation device.



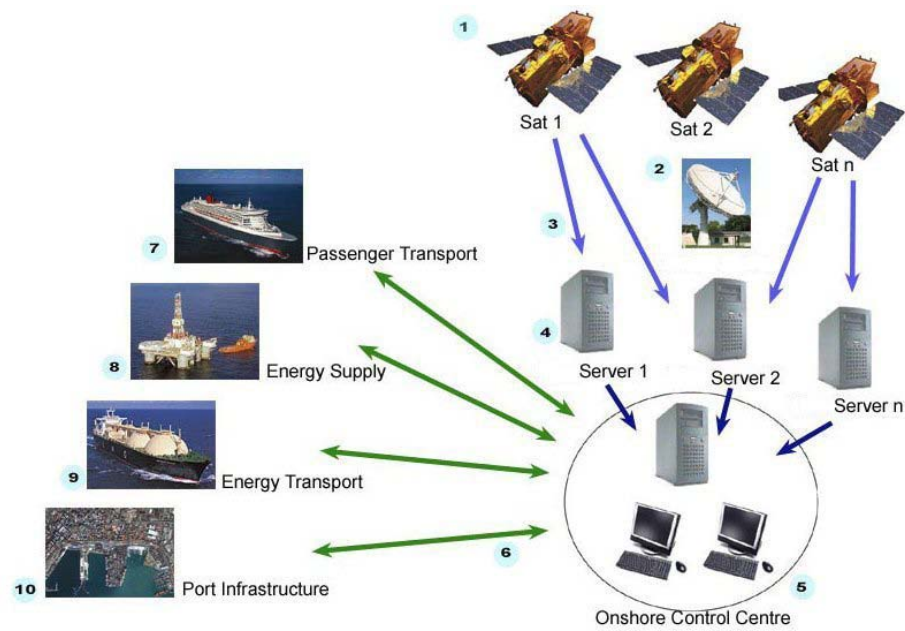
Safety and Automatic Docking:

- ❑ **EC DOCK** (2002): Developed an on-board system to help crews and pilots manoeuvre in harbours and to dock quickly and automatically, minimising the risk of hard landings, and ensuring that drift off does not occur.
- ❑ **Safe Port** (2007): Developed operations using European Geostationary Navigation Overlay Service (EGNOS) to help improve safety in ports, and efficiency in port operations, and to manage the consequent safety implications.



Port Security:

- ❑ **SETRONIC**, 2008: Addressed observation and protection of critical maritime infrastructures: Passenger and goods transport, Energy supply, and Port infrastructures. All accessible means of observation (offshore, onshore, air, space) of these infrastructures are networked via an onshore control centre.



The SETRONIC system

Future Research needs: 1

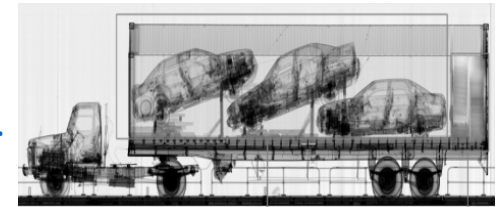
❑ Greening of Ports

Environmental issues, including energy, noise and protection of the marine environment, Energy efficiency design index (EEDI), GHG Foot printing, container security.

❑ Port Security

Increase port security by integrating legacy port systems with new surveillance and information management systems

(New security regulations: ISPS, EU COM(2003) 229, COM(2004) 76, 648/2005, 1875/2006 and (EC) No 414/2009).



❑ Cargo handling systems

Development of state-of-the-art automated and robotic systems, with computerised process management to simplify mooring, loading and unloading, for the latest automated shore side facilities.

❑ Systems of Transfer

Development of the most efficient transfer methods, for loading units from one mode to another.

Future Research needs: 2

❑ **Intelligent Transportation Technologies and Integrated ICT solutions**

Integrated ICT and ITS to enable more efficient planning, booking, simulation of logistics chain, routing and control of cargo along the different transport modes, as well as providing other services supporting efficiency, safety and security.

❑ **Container Imbalances and Management of Empty Containers**

A holistic approach is needed to address the management of empty container, supported by appropriate ICT solutions.

❑ **Ports Network and Data Exchange**

A real-time web-based system of port networking to identify and exchange vessel locations, planned routes, cargo facilities and dates and times of movement. (e-Maritime).



Conclusions:

- ❑ EU Research has provided important information for port operations on processes to be avoided, or how they can be improved, through the application of new support technologies, such ICT and simple data exchanges.
- ❑ The greening of ports, including port noise and use of energy, is now being addressed, but more research needs to be done with regards to:
 - ❑ Adaptation to climate change
 - ❑ Emissions management (light, noise and air quality e.g. cold ironing)
 - ❑ Equipment and energy efficiency
 - ❑ Rising sea levels.
- ❑ More research is also needed for:
 - ❑ Port and container security.
 - ❑ Simplifying mooring and cargo handling for automated shore side facilities.
 - ❑ Integrating a web based system of port networking, within the e-Maritime framework.



Thank you!



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