Maritime intermodal transportation: the interface between the academic world and the real world

Harilaos N. Psaraftis
National Technical University of Athens
www.maritime.deslab.ntua.gr

Context

- Personal experience
  - CEO at port of Piraeus, 8/1996-3/2002
  - Professor at NTUA
  - Involved in many EU projects (both sides)

Port of Piraeus

- One of the largest in Mediterranean
- ~12 million passengers/yr
- Top container hub in East Med
  - 575,000 TEU (1996)
  - 1,160,000 TEU (2001)
- Intermodal transportation very important

Q: what is the match between

- Supply of R&D in maritime intermodal transportation,

and

- Demand for R&D in this area

???

Interface between

- The academic world (supply of R&D)
- The real world (demand for R&D)

$$\max \sum_{v \in V} \sum_{r \in R_v} (p_{vr} - c_{vr}) x_{vr} + \sum_{i \in N_C} \pi_i s_i \ , \tag{6}$$

$$\sum_{v \in V} \sum_{r \in R_v} a_{ivr} x_{vr} + s_i = 1, \qquad \forall i \in N_C \, , \tag{7}$$

$$\sum_{v \in V} \sum_{r \in R_v} a_{ivr} x_{vr} \le 1, \qquad \forall i \in N_O \, , \tag{8}$$

$$\sum_{r \in R_v} x_{vr} = 1, \qquad \forall v \in V \, , \tag{9}$$

$$x_{vr} \in \{0,1\}, \qquad \forall v \in V, r \in R_v \tag{10}$$

$$s_i \in \{0,1\}, \qquad \forall i \in N_C \ . \tag{11}$$

Supply of R&D

- Many national projects
- Many EU projects
- Increased funding over last 10 years
- Q: Is picture clear?

Site last updated: 11-12-2002

Project Results

This section provides access to summaries of completed research projects. These identify the objectives, key results, policy implications and contact details.

If you find a project of interest, then check the Reports section of this web site to see if the full final report is available, or use the contact details to find the project co-ordinator and, in some cases, a web site address.

Summaries can be browsed by keywords or by acronym and title, please follow the links at the bottom of the page.

Themes

- Economic aspects
- Efficiency and quality
- Environmental aspects
- Freight intermodality
- Human factors
- Integrated policy aspects
- Interoperability
- Safety and security
- Social aspects
- Urban transport

Modes

- Air
- Integrated
- Rail
- Road
- Strategic
- Urban
- Waterborne

Browse documents by **Keywords**

Browse all Project Results sorted by **Acronym**

Project Results related to theme: Freight Intermodality

- Home
- Project Results
- Project Reports
- Thematic Overviews
- Publications
- Links
- Contacts
- FAQs

- 3SNET: Short sea shipping network: information, booking and management system to integrate short sea shipping in the intermodal transport chain
- AFTEI: Air freight transport and European intermodality
- APRICOT: Advanced pilot tri-modal transport chains for the corridors west to south/south-east Europe for combined transport
- ASDSS: Analysis of Supply and Demand for Shipping Services
- CESAR: Co-operative European System for Advanced Information Redistribution
- EMMA: European Marine Motorways: The potential for transferring freight from road to high speed sea transport systems
- EMOLITE: Evaluation model for the optimal location of intermodal terminals in Europe
- EUDET: Evaluation of the Danube waterway as a key European transport resource
- EUROBORDER: The port as a hub in the intermodal chain
- EUROSIL: European Strategic Intermodal Links
- FIRE: Freight Information in the Railway Environment
- FREIA: Towards the Networking of European Freight Villages
- FV-2000: Quality of freight village structure and operations
- IDIOMA: Innovative distribution with intermodal freight operation in metropolitan areas
- IMPREND: Improvement of Pre- and End-Haulage
- IMPULSE: Interoperable Modular Pilot Plants Underlying the Logistic Systems in Europe
- INFOLOG: Intermodal Information link for Improved logistics
- INFOSTAT: Information Systems
- INFREDAT: Methodology for Collecting Intermodal Freight Transport Data
- INTRARTIP: Intermodal Transport Real-time Information Platform
- INTRA-SEAS: Integrated Management of Multimodal Traffic in Port Terminals
- IPSI: Improved port/ship interface
- IQ: Intermodal quality
- IRIS: Innovative rail intermodal services

PRECISE IT: Precise Automatic Location System for the Management of Intermodal Transport Units and Vehicles, Inside Intermodal Terminals

- Home
- Project Results
- Project Reports
- Thematic Overviews
- Publications
- Links
- Contacts
- FAQs

BACKGROUND

In many intermodal freight terminals, additional costs, time delays and quality deficiencies are often due to the wrong positioning of Intermodal Transport Units (ITUs), and the inefficient management of personnel and vehicles dedicated to the moving of ITUs. One of the prerequisite conditions for improving the overall efficiency of the terminal operations is the automated provision of real-time error-free information about the position of all stocked ITUs and moving vehicles inside the terminal.

OBJECTIVES

The PRECISE IT objectives were to set-up and test a demonstration system for the automatic location of ITUs and vehicles inside intermodal terminal areas, in particular for maritime container terminals.

KEY RESULTS

GPS (Global Positioning Systems) and precise acoustic systems were selected, in the preliminary stage of assessing system requirements, as the most interesting technologies for the implementation of ITU location systems. GPS has already been used for precise location systems, but it was not clear at the beginning of the project what kind of results could be obtained for acoustic technologies. In particular, the demonstration system in the La Spezia Container terminal put most efforts into finding a solution for reach stackers, which are the most flexible vehicles inside a terminal and often are working in critical conditions from the point of view of position measurement.

Observations

- Results not readily available, especially to those who need them
- Results fragmented
- Input from users generally poor
- Results poorly disseminated, if at all
- Gap with respect to real needs (demand for R&D)

The demand side

- Q: Do we have a clear picture of ‘demand’ for R&D in this area?
- A: No, picture is even more fuzzy

Demand cont'd

- Indirect description of demand
- (e.g., Maritime Industries Forum 'R&D Masterplan')

- However:
- Most projects are 'supply driven'

Interest of industry: elusive

- Time horizon of these projects (long)
- Industry faces problems that are more ‘mundane’ than those examined in R&D
- For such problems, little or no help from R&D results is available

Mundane problem No. 1

- Port pricing

- Big issue in EU
- ‘user pays’ principle
- Profit & cost centers
- Demand elasticities
- Cross-subsidization
- Abuse of dominant position

Problem no. 1 cont'd

- No useful R&D results available
- Accounting system did not help
- Port's 'horizontal' structure did not help
- Lack of useful data
- >>>Used trial-and-error method

Tariffs restructured

- Massive effort (millions of different tariffs)
- Container handling (reduction of transshipment tariffs)
- Passenger shipping (increase)
- Storage (+/-)
- Misc. (simplification, +/-)

Results

- Piraeus major hub in Med
- Tariff simplification
- Move towards ‘user pays’

- Still, long way to go..

Mundane problem No. 2

- Lack of personnel in some areas
- Surplus of personnel in other areas
- Very difficult to shift people around

- (have to negotiate with unions)

Typical example

- 9+2 dock-workers
- 2 crane drivers
- Straddle carrier drivers
- Etc!

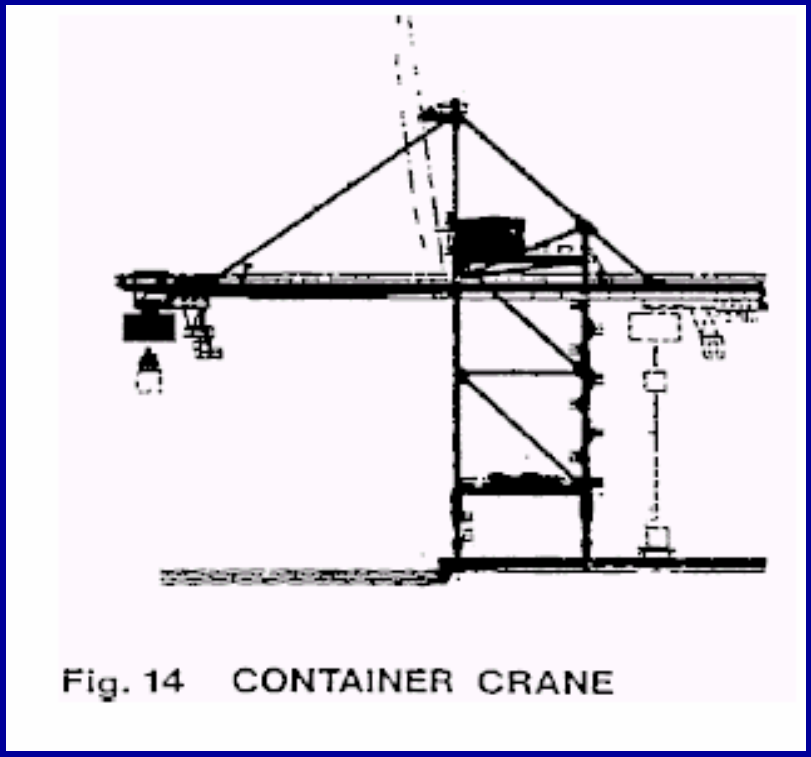

Fig. 14 CONTAINER CRANE

Mundane problem No. 3

- Computerize container terminal
- NOT putting on the computer what was done by hand!
- BUT, reengineering the operation of the terminal almost from scratch!

Mundane problem No. 4

- Intermodal flows

- Big issue in EU
- No useful O/D data exists
- Ultimate origins / destinations unknown
- Need this info for many reasons
- EU project SSS-CA

Mundane problem No. 5

- What if a ship sinks in your terminal???
- Engineering solutions
- Who owns the ship?
- Legal maze

Other ‘mundane’ problems

- Dealing with local communities
- Dealing with politicians
- Maze of laws and regulations

Matching R&D supply and demand

- Gap clearly exists
- Need better interaction between researchers and industry
- Need increased participation of industry in R&D projects
- Need thorough assessment of R&D results
- Need better dissemination

Thank you very much!!