Effective Operations in Ports
A European Research Project

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Effective Operations in Ports

EFFECTS

6th Framework Programme

European Commission
Directorate General Research
Consortium

37 partners from 12 European Member States

36 months project work after 12 months evaluation period
Do we need research for ports?

Does science foster innovation in ports?

Do researchers understand ports?
Do we need Research for Ports?

Probably not when we have to deal with a simple jetty and a few ships
Do we need Research for Ports?

Certainly yes when the port is a complex industrial area
when port waters become too busy
when port roads become too busy
when terminals become too busy
Research Needs

Examples

to handle challenging goods
to protect our environment
to improve safety
and to ensure our security
to name a few examples.
Does Science foster Innovation in Ports?

or can only practitioners produce new ideas?

collaboration is the solution!
Do Researchers understand Ports?

Not at all!

And here do we start with EFFORTS
• people listen but they do not understand each other
• same terms do not always mean same things
• same things are not always put into the same context
• practitioners as researchers are professionals – within their field of expertise and this may be very narrow

So how to get the crowd walk into the same direction, agree on terms of reference and provide them the holistic context of the complex world they shall improve?
A systematic and structured approach was required

• to elucidate the complex port systems
• allow convenient fragmentation
• effective processing
• reliable recompositon

always keeping the whole port in mind.

The solution should not only foster project work but serve the heterogeneous port industry to provide them with a more transparent picture.
CIMOSA = computer integrated manufacturing open system architecture
ISO CEN 19439 + 19440 Enterprise Architecture Modeling
CIMOSA Model

Application

(partially modified)

Reference Architecture

Generic Level

Partial Level

Particular Level

Resources

Function

Information

Organisation

Re-Engineering

Requirements Model

Specification Model

Validation Model

Implementation Model

Operation Model

Container Terminal

Terminal Container Export

Consolidating

Customs Inspection

Storing

Loading

Architectural Views
Navigation in Ports
Port ECDIS

Gridded Data plus bENC all
Precise Navigation and Manoeuvring in Ports
Tug Assistance

Situation Awareness
Tug Assistance
Tug Assistance

Tug Simulator for Training
Port and Environment
The CO$_2$ footprint of ports is getting into the focus and needs careful consideration.

Ports need to better manage their power consumption and might also become providers of clean energy.
International Convention for the Control and Management of Ships’ Ballast Water and Sediments (IMO)

• Identifying harmful aquatic organisms in ballast water
• Solutions to eliminate these or at least reduce negative consequences on the port environment by ballast water release.

Invasive species booking trips around the world in ballast water tanks

Chinese mitten crab on rise in English rivers
Polluting effect of Al anodes for cathodic protection of underwater steel constructions.
Loading or discharging operations of petroleum products

Reduction of volatile organic compounds (VOCs) which are considered as carcinogenic
EFFORTS tool allows to

- focus sound mitigation measures on most annoying sources
- to design ports resulting in minimum noise annoyance.
Port Operation
Identified port processes to
- make complexity transparent
- standardise and streamline business processes
- exploit potential of techniques and technologies to improve technical processes
- foster interoperability and integration of services within the port and externally
- allow for benchmarking in global context
- increase port productivity.
Port Processes

- Risk Assessments
- Methodologies
- Tools
- Case Studies
- Scenarios
- Best Practices
- Regulations
- Information Material

EFFORTS Core Task

Quick and easy access
RAPORT platform enables the port stakeholders:

- To assess mitigation measures by selecting the required risk control option (RCO) from more than 50 proposed ones or by adding new ones
- To evaluate the effect of the selected or added RCOs and to compare the different solutions by the cost benefit analysis
Port Skills and Competencies Passport

- Staff Operational & Management Level
- Regulations Recommendations Standards
- Equipment Tools Methods
- Activity Based Costing
- Site Environment
- Quality Assurance

Skills Knowledge Attitudes

Roles

Process

Observatory

Virtual University
Let's maintain a clear course of improvement that ships will always feel at home in European Ports.