COMPETITIVE AND SUSTAINABLE GROWTH (GROWTH) PROGRAMME

Contract for:

Shared-cost RTD and Demonstration project

Annex 1 "Description of Work" – Midterm Revision

Proposal number*:* GRD2-2001-50052
Project acronym: INTEGRATION
Project full title: Integration of Sea Land Technologies for an efficient Intermodal Door to Door Transport
Duration: 36 Months

Project Co-ordinator: CETENA S.p.A. – Centro per gli Studi di Tecnica Navale

Contractors:

See next page

Document Revision Date: 25/02/04

CETENA S.p.A	IT
IZAR Construcciones Navales S.A.	ES
FINCANTIERI Cantieri Navali Italiani S.p.A.	IT
TTS Ships Equipment	SE
SCIRO S.r.l.	IT
British Maritime Technology LTD	UK
LogIT	NO
Medcenter Container Terminal	IT
~~DFDS Tor Line A/S~~StoraEnso Transport and Distribution AB	~~DK~~SE
Grandi Traghetti S.p.A. di Navigazione	IT
Det Norske Veritas AS	NO
~~NDC~~DANAHER MOTION Automation AB	SE
~~TFK Transportforschnung~~ BMT Transport Solutions GmbH	DE
SSPA Sweden AB	SE
Universities of Glasgow and Strathclyde, Department of Naval Architecture and Marine Engineering	UK
Ship Design and Research Centre	PO
Port Authority of Livorno	IT
Göteborgs Hamn AB	SE
SEQUOYAH International Restructuring	BE
Vereniging Nederlandse Scheepsbouw Industrie	NL
SARLIS Container Services	GR
Nouveaux Espaces de Transport en Europe (Application Recherche)	FR
National Technical University of Athens	GR
Associazione Nazionale per la Promozione del Trasporto Marittimo a Corto Raggio	IT
Universitat de València (Estudi General)	ES

PROJECT MANAGEMENT AND ADMINISTRATION				**WP 0**
Starting date: month **1**	Duration: **36** months			Total Effort (MM): **~~43~~38**
Partners involved	T 0.1	T 0.2	T 0.3	MM
CETENA	7	24		31
FINCANTIERI		2		2
TTS Ship's Equipment		2		2
BMT			~~6~~1	~~6~~1
LogIT		2		2

Objectives

The overall objective of this work package is to coordinate and manage the project and its day-to-day progress. Further, to enable communication among the partners and between partners and the commission.

Διαγράφηκε: day to day

The work package aims at consolidation of the project planning, control, progress reports, milestone reports, cost statements and budgetary overviews using inputs from the partners.
Finally it aims at monitoring and motivating exploitation of the results.

Description

Each partner and Work Package Leader will formally report ~~quarterly~~bimonthly to the Project Coordinator about the progress of the work, on the basis of a regularly updated detail plan. The reports will include information about the technical progress, results obtained (deliverables) and compliance with the work programme. The progress status of the Work Packages will also be reported in terms of percentage of completion, estimated time to completion, actual man-months spent and man-months needed for the completion of the Work Package. ~~These reports will be consolidated and distributed among the partners.~~ The overall project status and planning will be summarised and regularly updated.

Review meetings will be held every 6 months to determine progress, planning and exploitation.
Project reports will be coordinated, consolidated and distributed. This especially concerns 6-monthly progress reports, more detailed 12-monthly progress reports, a mid-term assessment report and the final report (technical report, dissemination report, publishable summary and publishable synthesis report).
Every 12 months the Coordinator will prepare a consolidated overview of the budgetary situation of the project on the basis of the cost statements received from the partners for submission to the Commission and of the payments that have been made. The budgetary status will also be compared with the initial cost-per-year planning of the project.

The project will commence with an initial meeting and culminate in an open forum workshop where organisations from other projects, thematic networks and the wider community will be invited to attend.

ADMINISTRATIVE COORDINATION		**WP 0** **Task 0.1**
Starting date: month **1**	Duration: **36** months	Total Effort (MM): **7**
Partners involved		Effort (MM):
CETENA		7

Διαγράφηκε: R & D Task/Activity of Partner

Διαγράφηκε: Industrial R&D maritime field

Objectives

Description

The work envisaged in this task is directed to the fulfilment of the administrative and secretariat activity of the Consortium.

This structure refers to the co-ordination group already mentioned and it is composed by two professionals, one administrative and the other secretarial.

TECHNICAL COORDINATION		**WP 0** **Task 0.2**
Starting date: month **1**	Duration: **36** months	Total Effort (MM): **30**
Partners involved	R & D Task/Activity of Partner	Effort (MM):
CETENA	Industrial R&D maritime field	24
FINCANTIERI	Ship Design and Ship Building	2
TTS Ship's Equipment	Ship and Terminal Equipment Supplier	2
LogIT	Transport Consultant	2

Μορφοποιήθηκε

Διαγράφηκε: G

Objectives

Description

The work developed in this task is addressed to the technical co-ordination of the research activities envisaged in the technical workpackages. The General Co-ordinator is the chief of the technical coordinating structure, helped by two Co-ordinators.
Every WP has its own Leader who, as the coordinator of the various Partners involved in the WP, is in charge of the research organisation inside the WP.
A staff consisting of seven professionals (Co-ordinators) guarantees the connection among the workpackages' Leaders and the Co-ordinating groups. This is necessary to guarantee the research synergy, the contiguity of the topics examined in the various workpackages and the direct use by the researchers of the results obtained, necessary to continue the research.
To enable the necessary homogeneity of the co-ordinating and co-operation action, the co-ordination and Correlation groups will belong to a unique structure.

QUALITY CONTROL		**WP 0** **Task 0.3**
Starting date: month **1**	Duration: **~~36~~12** months	Total Effort (MM): **~~6~~1**
Partners involved	R & D Task/Activity of Partner	Effort (MM):
BMT	R&D Maritime	~~6~~1

Objectives

The objective is to ensure that the tasks of each work package and the overall project is undertaken according to appropriate quality standards.

Description

The project comprises a number of inter-related work packages, each with objectives, a modus operandi, deliverables and particular inputs and outputs related to other work packages.
INTEGRATION has a number of parallel activities but also a general flow, information transfer and feedback.

The function of quality assurance in this project will be to ensure that these processes work effectively. This is particularly relevant for INTEGRATION, since the whole concept is dependent on each task being done to an appropriate and a-priori defined standard.

This approach requires a project Quality Plan to be created at the commencement of the project. This task will act to set the framework and coordinate the quality plans of the network of work packages.

Each individual work package will specify its objectives, required inputs, essential methodologies, output and criterion for judging accomplishment of its tasks.
In INTEGRATION particular stress will be placed on the criterion for agreement and acceptance between the inter-related tasks.

NEW SHIP CONCEPT	**Vertical WP 1**
Starting date: month **1** Duration: **35** months	Total Effort (MM): 201.95

Partners involved	T 1.1	T 1.2	T 1.3	T 1.4	T 1.5	T 1.6	T 1.7	T 1.8	T 1.9		MM
CETENA	~~6~~8.5	~~12~~14.8	1	~~3~~10	~~1~~1.5	~~14~~13.5	~~15~~14.5	2	2		~~56~~67.8
IZAR	~~1~~2	~~2~~12		~~38~~28				2	2		~~45~~46
FINCANTIERI	3	~~2~~6	1	~~25~~18.5	~~4~~6	1	1	1	1		~~39~~38.5
TTS	2		2					1	3		8
GRFERRY			2								2
DNV	0.5	~~1~~1.3		2.5		1	2.7		0.25		~~7,95~~8.25
SSPA						12					12
CTO			~~10~~18	8.5		~~11~~21	11				~~32~~58.5

Objectives

The aim of the project is the Integration among the available technologies for cargo handling and shipbuilding technologies, in order to optimise the multimodal transport chain, enhancing the effectiveness of the maritime segment. The new integrated systems should meet present and future market and society needs giving on short term an appropriate answer to society needs and transports demand growth expected in the next decade and should be able to produce a new equilibrated modal split in favour of the maritime transport, the easiest way to achieve significant results in European road decongestion.

Technologies/results from other research projects

Reference is made to existing research project results, with priority to European founded projects.

Background

Shipbuilding has accumulated many different technologies over the years. Up to now SSS projects have been the results of individual initiatives. Land cargo handling technologies are mostly improved for traditional shipping services for which short time for approaching the quay, for mooring and loading/unloading operation are not mandatory.

Description

Starting from the improvement of the present Ro-Ro ship, the most widely used ship for short sea shipping, new ship concepts are conceived as a part of an integrated ship/shore system. These new ships, designed as a part of an integrated ship-shore system enable to maximise as a whole the sea transport and all other operations, loading unloading / transhipment operations, to transfer cargo to the inland modes.
The ship, part of the multimodal chain, a low manned highly automated ship, prepared to exploit the concept of the maritime highway, and therefore characterised by efficient data analysis and communication systems connecting the ship to land based control and management system.
New ship types enable to enhance ship performances of the whole waterborne segment including the interfaces to the land modes, in a competitive multimodal door-to-door transport chain, and should be characterised by massive production and equipped by high tech systems in order to be among the ship types that can be built by the European shipyards in a competitive way on the world market. An assessment of performances and costs will be

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Διαγράφηκε: 12
Διαγράφηκε: ~~23~~
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Μορφοποιημένο: Κουκκίδες και αρίθμηση
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carried out in order to select two or more ship-shore integrated system to be designed and validated.

In order to address the objectives, this WP is structured around a series of practical design tasks, leading to the Design of a new concept of ships.

Hydrodynamic and structural design tools will be used to carry out experimental and theoretical investigations, and this design will be evaluated on the basis of manufacturing process.

Simulations performed in Horizontal WP1 will be used for the functional analysis of the ship shore loading/unloading systems.

This WP is articulated in nine Tasks:

Task 1.1	Conceptual design of ship-shore integrated system
Task 1.2	Conceptual ship design / Analysis of performance
Task 1.3	Existing Ro-Ro Ship refitting for automated loading/unloading operation
Task 1.4	Final ship design
Task 1.5	Ship manufacturing process
Task 1.6	Ship hydrodynamics
Task 1.7	Ship structures
Task 1.8	Final integration ship-shore systems
Task 1.9	Performance assessment cost/efficiency

CONCEPTUAL DESIGN OF SHIP-SHORE INTEGRATED SYSTEM		**Vertical WP 1 Task 1.1**
Starting date: month nr. **2**	Duration: **~~4~~16** months	Total Effort (MM): **~~12,5~~16**
Partners involved	Task Leader	Effort (MM):
CETENA	X	~~6~~8.5
IZAR		~~1~~2
FINCANTIERI		3
TTS		2
DNV		0.5

Μορφοποιήθηκε
Διαγράφηκε: ~~15,5~~
Διαγράφηκε: ~~3~~
Διαγράφηκε: CTO
Διαγράφηκε: 2

Objectives

Μορφοποιήθηκε
Μορφοποιημένο: Κουκκίδες και αρίθμηση

Identification of ship-shore integrated system for automated cargo handling loading and unloading ships according to functional requirements and available technologies

Description

Μορφοποιήθηκε
Μορφοποιημένο: Κουκκίδες και αρίθμηση

Activity:

Select alternative technologies and combine them at system level

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Starting from the functional requirements and mission profile, identified in the door-to-door freight transport scenarios intermodal chains and modal split on major routes, the most promising technologies, identified in the first phase of the existing technology review, taking also into account eventual needs for new technologies, some individual technologies are identified to be the components of an integrated ship-shore system. This system is conceptually defined to perform all the terminal operations and the loading/unloading and lashing of the ship in an efficient, safe and environmentally friendly manner.

Select a number of ship-shore systems for loading/unloading, cargo handling and lashing

Μορφοποιημένο: Κουκκίδες και αρίθμηση
Μορφοποιήθηκε

Among all the alternatives identified in the previous activity a reduced number of systems (~~4/5~~2 in a first phase) are identified to be studied in detail. These systems should meet all the requirements in terms of cargo units, cargo volume, ship size, ship-handling time etc.

Conceptual design of ship-shore systems (~~4/5~~2)

Μορφοποιημένο: Κουκκίδες και αρίθμηση
Μορφοποιήθηκε
Διαγράφηκε: Lay-out

Layout of the cargo-handling equipment area and storage area on shore, first ship concept and general arrangement of the ship, with particular interest in the ship’s cargo storage and handling areas and ship-shore connection.

Functional verification of the ship-shore systems(~~4/5~~2)

Μορφοποιημένο: Κουκκίδες και αρίθμηση
Μορφοποιήθηκε

This activity will create the input of the simulation activity in order to verify the system functionality, geometries, constraints etc.

In a second phase additional ship shore systems (4) are identified and studied, in order to provide a ship shore system solution for each ship solution identified in the conceptual ship design phase (WP V1 Task 2). For each system the activities of conceptual design and functional verification are carried out.

Μορφοποιήθηκε

CONCEPTUAL SHIP DESIGN / ANALYSIS OF PERFORMANCE		**Vertical WP 1 Task 1.2**
Starting date: month nr. **1** Duration: **17** months		Total Effort (MM): **~~16~~42.1**
Partners involved	Task Leader	Effort (MM):
CETENA	X	~~12~~14.8
IZAR		~~2~~12
FINCANTIERI		~~2~~6
DNV		~~1~~1.3
CTO		8

Objectives

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Preliminary definition of the ship's characteristics such as dimensions, displacement, speed, operating range, sea-keeping, general arrangement and shore integration, with comparative analysis of performance. Individuation of advanced manning to develop tools and guidelines to reduce crew sizes without sacrificing the effectiveness and safety of the total ship system.

Description

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

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Based on ~~the results of Horizontal task 3.1 and 3.2, (~~functional requirements and mission profiles, existing technology review and technology needs and requirements~~)~~ and taking into account the first ideas on market demands and taking the input from Vertical task 1.1 (conceptual design of ship-shore integrated system), new concepts of ships for SSS will be developed, reanalysed as a whole and the most focused design in SSS economic benefits (input from task Horizontal task 3.6),

~~Four ship solutions (A1, A2 and A3 of conventional speed, and B1 for HSC) ~~Several ship solutions will be developed in detail up to contract specification level:

3 ROPAX solutions: A1 and A2 (conventional speed), B1 (high speed)

5 RORO solutions : A3, A4, A5 (conventional speed), B2 (high speed), SES (surface effect)

Only a broad approach as per Horizontal task 3.2 assures that all technologies are taken into account, but a detailed and deep development is needed in order to enable further evaluation by final users. So this task will work from a multitude of inputs resulting from state of the art, and provide input to Vertical task 1.4 (final design) in which two types of ships, one conventional speed vessel and one high speed craft very close to the market will be developed.

New SSS design alternatives, through an interactive-integrative approach, as above described will be performed according to following guidelines:

a) Operating characteristics:
  - Included in the intermodal process, in compliance with requirements door to door;
  - with proper capacity, speed, endurance;
  - according course operatively.

b) General characteristics:
  - with high and articulated capacities of loading / unloading;
  - with typology flexibility (trucks and/or containers and/or pallets and/or cars) and ways of

loading (stern, ramp /door and other systems for instance ramp door at different levels for cellular cargo);
  - with high automation contents in order to have minimum crew in safe conditions (satellites aids);
  - alternative with passengers, if any following
  - provided with the necessary equipment to reduce environmental impact (Washing, clean paints, air pollution saving)

c) Cost saving approach:
  - for design content and building process
  - with reduced maintenance.

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For each design alternative solutions the following activities are carried out:

- Definition of functional requirements and mission profile for the ship
- main dimensions and general arrangements of the ship,
- preliminary hull forms and body plans, powering estimation with statistical formula.
- Preliminary evaluation of displacements
- simplified hydrostatic calculations for both intact and damaged conditions.
- Procedure for conceptual ship design, defined according to Classification Society in order to identify the class of the ship and to obtain a preliminary approval of the ship design at concept level.
- Verification of hydrodynamic characteristics of the ships (parametric sensitivity study on resistance, motions), using CFD whenever required (interrelation with Vertical task 1.6).
- Alternative structural solutions identification and selection of the optimal one from the point of view of weight and of manufacturing time and costs. (interrelation with Vertical task 1.5 and Vertical task 1.7).Comparison among project alternative solutions on the basis of the cost/performance ratio (interrelation with Horizontal 1.6 via Vertical task 1.5).
- Design of propulsion, manoeuvring and mooring system.
- Verification of the operational characteristics of harbour approach and ship mooring (interrelation with Vertical Task 1.6).
- ~~IT system for automation and data analysis and communication.~~
- Drawings and ship specifications, at contractual level

Διαγράφηκε: 3

Among the ~~three~~ ship (conventional speed) solutions one or more will be selected to be further developed up to the final design phase. The selection will be done on the base of market demand and taking into account the attractiveness of the designed ships from the shipbuilder's point of view.
The two high speed ship solutions will be developed up to the final design phase.

EXISTING RO-RO SHIP REFITTING FOR AUTOMATED LOADING/UNLOADING OPERATIONS		**Vertical WP 1 Task 1.3**
Starting date: month nr. **4**	Duration: **~~10~~20** months	Total Effort (MM): **~~16~~24**
Partners involved	Task Leader	Effort (MM):
CETENA		1
FINCANTIERI		1
TTS		2
GRFERRY		2
CTO	X	~~10~~18

Objectives

Scope of this task is to integrate on existing Ro-Ro vessel land handling system for automated loading and unloading and lashing operations and to define the eventually required refitting of the ship and the implementation of the cargo handling systems in order to realise the ship-shore integration.

Description

Activities

An analysis of the existing Ro-Ro vessels in service for intercontinental transport and SSS/ feedering is carried out and the typology of the most significant vessels will be identified and selected (3/4).

Starting from the existing technology review of cargo handling operating systems (Horizontal task 3.2, AGVs automated autonomous rail vehicles etc.) and in close interrelation with Vertical Task 2.1 (Physical implementation of technology involved in the selected demo-sites) a first definition of the characteristics of the AGVs/automated autonomous rail vehicles etc. will be carried out.
On the base of the selected ship for demo-site in Genoa and Gioia Tauro the most appropriate characteristics of AGVs etc. will be specified.

For the other ship types which represent the major part of the existing Ro-Ro fleet 2/3 AGV specifications will be produced, such as the functional requirements of an AGV for automated loading and unloading and lashing operations of car carriers (interrelation with Vertical Task 2.1).

A design will be made to refit three types of Ro-Ro vessels, which includes at least one of the ships used at the demo-sites. This design will include general arrangement for loading and unloading operations refitting of ship structure and equipment and mooring and cargo lashing systems.

The functional characteristics of the ship-shore systems will be evaluated in interrelation with Horizontal task 1.4 in order to optimise the ship refitting design and cargo handling characteristics.

Whenever required, the definition of functional requirements and specification for new type of cargo handling system will be defined in order to efficiently reach the most efficient integration between the ship and the cargo handling system and to maximise the percentage of cargo to be loaded and unloaded automatically.

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Διαγράφηκε: CTO

Διαγράφηκε: X

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Διαγράφηκε: FINCANTIERI

Διαγράφηκε: 1

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Μορφοποιήθηκε

Μορφοποιήθηκε

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FINAL SHIP DESIGN		**Vertical WP 1 Task 1.4**
Starting date: month nr. ~~18~~**14**	Duration: ~~14~~**18** months	Total Effort (MM): ~~68.5~~**67.5**
Partners involved	Task Leader	Effort (MM):
CETENA		~~3~~10
IZAR		~~38~~28
FINCANTIERI	X	~~25~~18.5
DNV		2.5
CTO		8.5

Objectives

Scope of this task is to develop the detailed design and technical specifications of ~~two~~ the selected different solutions, ~~one~~ both for conventional speed and ~~other~~ for HSC.

Description

Starting from the output of the conceptual ship design the final design of ~~one~~ several conventional speed vessel and of ~~one~~ two high-speed vessel will be carried out.

The level of detail of the design should allow the classification society to identify a possible class for the ship and to approve the concept. The level of detail should also allow to clearly define all the systems and technologies, which enable to meet the requirements for the ship as specified in Vertical task 1.2 and allow the shipbuilder to define the manufacturing process, the ship building characteristics and construction lead time and costs of the ship.

Conventional speed ship

The full final design of the RoRo A5 ship solution will be carried out by CTO.

Fincantieri will focus its efforts on specific aspects of the RoPax A1 solution (especially in the optimisation of propulsion systems).

Cetena and Fincantieri will develop the full range of A4 solutions, with a deeper level of detail for the 1600 TEU alternative and a conceptual design level for the other alternatives.
Four alternatives are going to be developed, investigating the design-to-cost opportunities offered by modularity in design and in manufacturing.

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Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

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Μορφοποιημένο: Κουκκίδες και αρίθμηση

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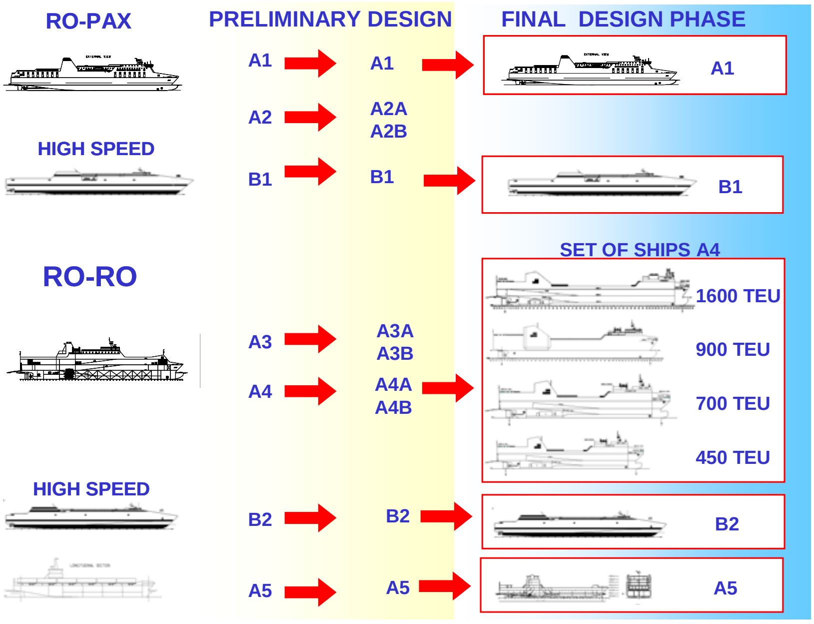

The general arrangement and the ship specification will be defined ~~and a second design iteration is carried out in order to optimise~~ with detailed studies of solutions when appropriate. Since the large number of solutions developed, not all aspects will be studied in details for all of them.

Hull forms
Structures
Building strategy and manufacturing process
Propulsion systems
Manoeuvring devices and mooring systems
Ship/shore connections and cargo lashing systems
Outfitting machinery, equipment and systems
Ship automation and control systems
Data analysis-data mining / communication
Ship/shore systems for automated loading/unloading and cargo lashing operations

Διαγράφηκε: Outfitting machinery

Using the design procedure as input from Vertical task 1.2 wave load will be defined and approved by classification society, as far as the other design loads, safety coefficients and allowable stress levels (including fatigue and ultimate loads).

Whenever requires finite elements calculation will be carried out to optimise structural solutions and to verify for the selected solution stress levels, buckling, fatigue and ultimate load, of the overall ships and of the most significant structures and details (interrelation with Vertical task 1.7).

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CFD calculation will be used to optimise hull form and ship hydrodynamic performances from the point of view of resistance and sea-keeping.

Stability will also be checked ~~for intact and damaged conditions~~ for the most significant cases.

The operability of the ships at different sea state will be taken into consideration in the hull forms optimisation process.

The configuration of governing and propulsion devices will be finalised based on manoeuvring characteristics (interrelation with Vertical task 1.6)

~~Real time simulation will be used to define the mooring system configuration (interrelation with Horizontal task 1.4)~~
Results of simulation (interrelation with Horizontal task 1.4) will be used to assess the performance characteristics of the automated system for cargo loading and handling operation

Results of manufacturing process will also be used to optimise the structural solutions and the systems layout and outfitting

Final ship specification and drawings

Specification harbour approaching and terminal operation

Lead time and ship cost

Are carried out.

High speed craft
The final design will be also carried out for the two HSC. The HSC will be completely developed.
All the design aspects and the verification will be carried out by IZAR, so including hydrodynamic and structural design.

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Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Διαγράφηκε: out by

SHIP MANUFACTURING PROCESS		Vertical WP 1 Task 1.5
Starting date: month nr. ~~7~~11	Duration: **14** months	Total Effort (MM): ~~5~~**7.5**
Partners involved	Task Leader	Effort (MM):
CETENA		~~1~~1.5
FINCANTIERI	X	~~4~~6

Διαγράφηκε: Αλλαγή σελίδας

Διαγράφηκε: ~~7~~

Objectives

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Scope of this task is to evaluate from the early design stage the alternative design solutions, from the manufacturing point of view as to identify solutions, in which standard modules for mass production can be built by using an automated process.
The standard module identified should allow to build up series of modular ships of different sizes efficiently.

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Διαγράφηκε: of modular

Description

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Starting from the first concept design and from the ships structural solutions alternative modular solutions are analysed and input to the conceptual design phase will be provided in order to optimise the design solution. Interrelation with Vertical task 1.2 and Vertical task 1.4.

The RoPax solution A2 will be studied by Fincantieri and Cetena first, followed by the study of 3 different alternatives of the RoRo solution A4 (the alternatives will be either different A4 sizes or different manufacturing alternatives for the first studied solution, the 1600 TEU).
The RoPax study will contain the general analysis of ship manufacturing processes, which are common to all the developed solutions and will not be duplicated in the following studies.
The activities will be carried out in conjunction with the WP H task 6, ship manufacturing process simulations, since their results will be the direct input for the simulations.

In order to develop an analysis capable of breaking the schemes typical of the Ship Manufacturing sector, specific consults with expertise coming from other sectors will be involved in the activities.

The building strategy will be identified and the following activities will be carried out:

Block and large module (composed by several blocks) definition
Definition of automated production and assembly procedure for mass production to allow competitive average cost per unit weight of the whole ship structure.
Production technology, production plan and facilities for automated and robotised manufacturing of components, blocks and large modules
Assembly technologies
Logistics and material flow
Block and module outfitting
Block and module assembly

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Διαγράφηκε: blocks)definition

A cost and benefit evaluation of alternative production processes will be carried out.

SHIP HYDRODYNAMICS		**Vertical WP 1 Task 1.6**
Starting date: month nr. **7** Duration: **24** months		Total Effort (MM): ~~39~~**48.5**
Partners involved	Task Leader	Effort (MM):
CETENA	X	~~14~~13.5
FINCANTIERI		1
DNV		1
SSPA		12
CTO		~~11~~21

Objectives

Scope of this task is to verify the hydrodynamic characteristics of the designed ships by CFD calculations and model tests.

Description

In the conceptual design phase, preliminary Hydrodynamic analysis and calculations will be performed in this task for the conventional speed designs:

- wave resistance calculations (2 solutions);
- sea-keeping operability calculations (2 solutions);
- simulation of standard manoeuvres (1 solution);
- simulation of crabbing and harbour manoeuvres (1 solution).
-

~~For the three conventional speed design alternatives hydrodynamic analysis and calculations will be performed in this task.~~ All hydrodynamic calculations and simulations with respect to the High Speed Craft will be performed by IZAR and are included in Vertical Task 1.4.
The following activities including model basin tests will be performed more in detail for the final design solutions for the conventional speed vessels:~~.~~

- RoPax A1 - Fincantieri (within V1.4 budget);
- Range of RoRo A4 - Cetena;
- RoRo A5 - CTO.

Planned Activities:

  - o hull form design (all the solutions)

- ~~➢ Hull optimisation~~
  - ~~o wave resistance calculations for various alternatives~~
  - o sea-keeping operability calculations for various alternatives (A4 range - 4 solutions, A5)

- ~~➢ Revised design~~
  - o simulation of standard manoeuvres to verify requirements (A4 range - 4 solutions, A5)
  - ~~o simulation of crabbing and harbour manoeuvres to verify the operational requirements~~
  - o ~~determination of wave loads by sea keeping calculations~~

- ➢ Model-tests will be carried out for one or more design solution, a suitable testing program is here below described, the final and equivalent detailed test plan will be defined accordingly to the specific needs coming from the specific cases. The first solution to be tested will be RoPax A1.

Διαγράφηκε: ~~28~~

Διαγράφηκε: SSPA

Διαγράφηκε: 12

Διαγράφηκε: DNV

Διαγράφηκε: 1

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Διαγράφηκε: and model

- Manufacturing of a model of a length of about 5 m and a displacement of about 500 dm^3. The model will be divided amidships in two parts and connected again with a 6-component balance in order to identify the global wave load, shear forces and bending moments.
- Resistance and self-propulsion tests on original configuration and on the optimised final configuration. Minor modifications of the model will be carried out whenever required.
- Instrumentation and set-up for sea-keeping tests. The model will be instrumented for measuring:
  - Speed
  - Surge, sway, heave, roll pitch and yaw
  - Accelerations
  - F_x, F_y, F_z, M_x, M_y and M_z at L/2

  Test set-up speed calibration and roll decay tests
- Sea-keeping tests in oblique seas will be carried out considering an appropriate wave directions and sea states. maximum significant wave height about 0.28 m in model scale, maximum speed about 2.8 m/s in model scale.
- free sailing manoeuvring tests: Standard tests for prediction of IMO manoeuvring performance (turning circle, zig-zag and reverse spiral tests). Tests to determine max crabbing speed in calm weather.
- captive tests to identify manoeuvring coefficients: Standard tests for determination of hydrodynamic coefficients of a simulation model, including :
  - Static drift: range of drift angles at two speeds and with heel angle at one speed
  - Rudder angle: range of rudder angles at zero and one drift angle at two speeds
  - Propeller load: range of propeller revs at range of rudder angles at one speed
  - Drift and yaw: range of radii at zero and one drift angle at two speeds
  - Oscillating: pure sway and pure yaw
- Special tests for determination of crabbing forces from main propellers/rudders and effective bow thruster forces as function of speed and yaw rate.

➢ If the shipyard will consider it necessary, additional p~~P~~ropulsion studies will be carried out on RoPax A1 and RoRo A5:
  - RANSE calculations to determine ship wake in relation to stern forms
  - Selection of propulsor using lifting surface method
  - Propulsor verification using panel method

Διαγράφηκε:

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιήθηκε

Διαγράφηκε: seastates

SHIP STRUCTURES		**Vertical WP 1 Task 1.7**
Starting date: month nr. **7** Duration: **16** months		Total Effort (MM): ~~29 7~~**29.2**
Partners involved	Task Leader	Effort (MM):
CETENA	X	~~15~~14.5
FINCANTIERI		1
DNV		2 7
CTO		11

Διαγράφηκε: ,

Διαγράφηκε: CTO

Διαγράφηκε: 12

Διαγράφηκε: ,

Objectives

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Scope of this task is to verify the structural characteristics of the designed ships, by FEM calculations whenever required.

Description

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

In the conceptual design phase, preliminary structural analysis and calculations will be performed in this task.
~~For the three conventional speed design alternatives structural analysis and calculations will be performed in this task.~~ All structural calculations and simulations with respect to the High Speed Craft will be performed by IZAR and are included in Vertical Task 1.4.

More detailed structural analysis will be performed for the final design solutions for conventional speed vessels:

- Range of RoRo A4 - Cetena;
- RoRo A5 - CTO.

The structural analysis and verification will be articulated as follows:

- ➢ General arrangements design.
- ➢ Structural design.
- ➢ Investigation on longitudinal and transversal strength by simplified 3D models in order to identify the possible structural solutions for the design alternatives.
- ~~➢ Longitudinal and transversal strength calculations by improved 3D FEM models, which take into account the progress of the structural design. Buckling phenomenal will also be taken into consideration (stiffened and unstiffened panels and stiffeners).~~
- ➢ Detailed stress analysis of critical structural areas and elements based on 3D/2D models using the top/down methodology.
- ~~➢ Very detailed FEM model calculation including mesh adaptive methodology will be performed to obtain the stress concentration factor for fatigue analysis.~~
- ~~➢ Evaluation of the ultimate longitudinal bending moment (ultimate strength) of the hull structure.~~
- ~~➢ The final design will be further improved by numerical optimisation tools with respect to weight and vertical position of the centre of gravity. Buckling phenomena is taken into consideration in this analysis.~~
- ➢ ~~Any other unconventional local load/analysis will be taken into consideration whenever required.~~

Διαγράφηκε: ~~calculation~~

Διαγράφηκε: ~~Αλλαγή σελίδας~~

FINAL INTEGRATION SHIP/SHORE SYSTEMS		**Vertical WP 1 Task 1.8**
Starting date: month nr. **19** Duration: **17** months		Total Effort (MM): **6**
Partners involved	Task Leader	Effort (MM):
CETENA	X	2
IZAR		2
FINCANTIERI		1
TTS		1

Μορφοποιήθηκε

Μορφοποιήθηκε

Objectives

Scope of this task is the evaluation of the final integration of the ship with all the shore technologies and systems considered in the project, in particular those systems improved in the project or used to perform tests on demo-sites.

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Διαγράφηκε: of the

Description

In this task the existing Ro-Ro vessel, taken into consideration in Vertical Task 1.3 and the new concept ships investigated, including those at the final design level will be considered for the final verification of the integrability with the shore technologies implemented in the project.

Διαγράφηκε: 1.3 and

Activity

Definition of the validation case (e.g. terminal configurations, definition of cargo units, cargo unit weight and volumes to be loaded/unloaded, functional specification for terminal operations, ship types and land technologies).
Definition of the input for the simulation case (Horizontal task 1.5).
Evaluation of the simulation results.

The activities above will be carried out for a number of selected cases.

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Διαγράφηκε: f.i

Διαγράφηκε: ..

Διαγράφηκε: ¶

Διαγράφηκε: Αλλαγή σελίδας

PERFORMANCE ASSESSMENT COST/EFFICIENCY		**Vertical WP 1 Task 1.9**
Starting date: month nr. **32**	Duration: **3** months	Total Effort (MM): **8.25**
Partners involved	Task Leader	Effort (MM):
CETENA		2
IZAR		2
FINCANTIERI		1
TTS	X	3
DNV		0.25

Objectives

The objective is to identify a ship-shore system meeting the technology requirements and market demands.

Description

From the ship-shore systems taken into account in the final integration task (Vertical task1.8) the most interesting case will be analysed in order to identify in detail cost performance rates.

Activities:

Definition of:

- Shipbuilding cost and price
- Ship's service and maintenance costs
- Shore facility costs
- Shore facility operations and maintenance costs

Life Cycle Cost will be identified for some ship types (refitted Ro-Ro's, and the two final designs) and related to the performance analysis for each ship shore system solution in order to identify the potential of the system on the market.

Διαγράφηκε: 13,25

Διαγράφηκε: DNV

Διαγράφηκε: 0,25

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

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EFFICIENT PORT / TERMINAL OPERATION

Vertical WP 2

Starting date: month ~~5~~**1** Duration: ~~22~~**30** months

Total Effort (MM): ~~216.95~~**218.95**

Partners involved	T2.1	T2.2	T2.3	T2.4	T2.5	T2.6	T2.7	T2.8	MM
CETENA								6	6
TTS	~~66~~62	4	1	5	8			3	~~87~~83
SCIRO							~~3~~5		~~3~~5
LOGIT							1		1
MED. CONTAINER TERMINAL					24				24
~~DFDS~~STORAENSO		4							4
GRANFERRY				8					8
DNV			0.25						0.25
~~NDC~~DANAHER MOTION	~~29~~33	11		11	11			3	~~65~~33
Port of LIVORNO							6		6
PORT OF GOTHENBURG	1	2	1						4
SARLIS						8.7			8.7

Objectives

The objective of this work package is to demonstrate how port terminals might operate in order to be regarded as efficient hubs in multimodal transport operations and to provide the relevant technologies for transferring cargo between ship and land based transport. The dry port concept and a high performance container transport in the Mediterranean sea will be also analysed.

Technologies/results from other research projects

The Ro-Ro concept was originally developed in the IPSI project.
Experience and results from a number of previous EU and national projects will also be used, such as: Interport, Euroborder, ShipLog (Norway), TRILOG-Europe, and REDEFINE.
A special attention was devoted to the EU Project IMPULSE.
In addition there will be close cooperation with the Thematic Network Advances and the DG TREN project TRAPIST.

Description

The Vertical WP2 is articulated in various Tasks, namely:

Task 2.1 Physical implementation of technologies to be integrated in the selected demo sites

Task 2.2 Demonstrating efficient Ro-Ro loading/unloading using AGVs and automatic lashing in Gothenburg

Task 2.3 Demonstrating the interoperability of cargo transportation systems in Gothenburg

Task 2.4 Demonstrating efficient Ro-Ro loading/unloading using AGVs and automatic lashing in Genova

Task 2.5 Demonstrating efficient transhipment container terminal operations in Gioia Tauro

Task 2.6 Demonstrating innovative technologies for high performances container transport between Piraeus and Valencia

Task 2.7 Demonstrating efficient dry port operation in Livorno

Task 2.8 Achievements and Result Evaluation

PHYSICAL IMPLEMENTATION OF TECHNOLOGIES TO BE INTEGRATED IN THE SELECTED DEMO SITES			**Vertical WP 2** **Task 2.1**
Starting date: month ~~5~~**1**		Duration: ~~12~~**22** months	Total Effort (MM): **96**
Partners involved	Task Leader	Activity	Effort (MM)
TTS	X	AGV, Ro-Ro cassettes, trailer- trestles and kerbs	~~66~~62
~~NDC~~DANAHER MOTION		AGV navigation system	~~29~~33
PORT OF GOTHENBURG		Test facilities	1

Objectives

Μορφοποιήθηκε

The objective is to implement all technologies, tools and systems to be used to perform the physical demonstration of integration capabilities at a demo site.

Technologies/results from other research projects

Μορφοποιήθηκε

The Ro-Ro concept was originally developed in the IPSI project.

Description

Μορφοποιήθηκε

The activities involved in this task are:

A) Specification and manufacturing of Ro-Ro cassettes, trailer trestles and kerbs

Μορφοποιήθηκε

This task will use the results in the IPSI testing program and produce production ready Ro-Ro cassettes, trailer trestles and kerbs with the right attributes.
The experiences from current tests etc. will be documented in a requirements specification, and the cassettes, trestles and kerbs will be constructed. A sufficient number of cassettes, trestles and kerbs will be made available for demonstration purposes.

B) Specification and manufacturing two AGVs including the navigation and control system.

The existing version of the AGV will be modified for the purpose of being able to be used onboard the vessel for loading and unloading Ro-Ro cassettes. Furthermore, the AGV control system will be amended so that AGVs may move as a train without having mechanical connections, in addition to operating individually. Two IPSI AGV's will be built that will load and unload IPSI cassettes from a ship arranged with IPSI kerbs. An AGV shall also be able to bring and place a cassette under a container crane for loading/unloading containers or bring the cassette to the truck/rail service centre, where containers will be loaded/unloaded using either a reach stacker or a straddle carrier.

The AGV will be built according to the specifications below:

Length:	12,2 m	Speed:	
Width:	2,3 m	Empty:	30 km/h
Max. height:	1,1 m	Loaded:	20 km/h
Min. height:	0,67 m	Loaded climbing:	7 km/h
Turning radius:	18 m	Weight:	12 Tons
Climbing angle:	5°	Capacity:	~~60~~90 Tons

Furthermore, the AGVs must be able to trigger the automatic lashing mechanism to secure cargo during loading and freeing cargo for unloading.

The starting point is the already operational AGVs developed on the basis of the translifters used in serving the IPSI vessels operating between Gothenburg and Zeebrugge.

DEMONSTRATING EFFICIENT RO-RO LOADING/UNLOADING BY AGVS AND AUTOMATIC LASHING IN GOTHENBURG		Vertical WP 2 Task 2.2
Starting date: month **19**	Duration: ~~1.5~~**3** month	Total Effort (MM): **21**
Partners involved	Task Leader	Effort (MM)
TTS	X	4
~~DFDS~~STORAENSO		4
~~NDC~~DANAHER MOTION		11
PORT OF GOTHENBURG		2

Objectives

Μορφοποιήθηκε

Μορφοποιήθηκε

The objective is to demonstrate high performance Ro-Ro loading and unloading of cargo using AGV's and automatic lashing in the port of Gothenburg.

Technologies/results from other research projects

Μορφοποιήθηκε

Μορφοποιήθηκε

The Ro-Ro concept was originally developed in the IPSI project.

Description

Μορφοποιήθηκε

Μορφοποιήθηκε

The testing of the new technologies integration will be performed in the Port of Gothenburg.
Prior to testing the Ro-Ro operations, the area of the port where the testing is to be performed must be equipped with sufficient infrastructures for positioning and controlling the AGVs.

The demonstration will be divided in two parts.

Two AGV's will bring 8 cassettes from a marshalling area on to a ship equipped with 2 x 100 lanes of IPSI kerbs, where the cassettes will be loaded/unloaded and lashed/unlashed automatically and then back again. The demonstration will be one 6 h cycle.

Tug masters will bring 7 trailers from a marshalling area on to a ship equipped with 2 x 100 lanes of IPSI kerbs where the trailer equipped with IPSI trailer trestles will be loaded/unloaded and lashed/unlashed automatically and then back again. The demonstration will be one 6 h cycle.

The activities to be performed in this task are the following:

- Description of the various technologies to be integrated at demo site
- Specification of the test cases to be performed at demo site, including the measurement and data acquisition programme
- Preparation of the demo site with acquisition of all the technologies/tools/elements that are involved in the test performance
- Test(s) execution
- Analysis of results, remarks, comments and recommendations

Μορφοποιημένο: Κουκκίδες και αρίθμηση

DEMONSTRATING THE INTEROPERABILITY OF CARGO TRANSPORTATION SYSTEMS IN GOTHENBURG		**Vertical WP 2** **Task 2.3**
Starting date: month **20**	Duration: ~~1.5~~**3** month	Total Effort (MM): **3.25**
Partners involved	Task Leader	Effort (MM):
TTS	X	2
DNV		0.25
PORT OF GOTHENBURG		1

Objectives

Demonstration of efficient Ro-Ro operations linkage with land-based transport means and port terminal storage areas.

Technologies/results from other research projects

The Ro-Ro concept was originally developed in the IPSI project.

Description

The possibility of integration of an innovative automatic system for cargo transfer in transhipment operation, in efficient terminal operation will be demonstrated and validated on actual demo site.
The task aims at providing a solution for an efficient transfer of cargo between ship and train/truck in such a way that the operation requires as few installations as possible in the port terminal. That would lead to the evaluation of performance of an efficient innovative automatic system for cargo transfer.

How the demonstration will be done:

Two AGV's will bring cassettes from a marshalling area to the truck/rail service centre, where containers will be loaded/unloaded with either reach stackers or straddle carriers and then back again. The demonstration will be of one 6h cycle.

The activities to be performed in this task are the following:

- Description of the various technologies to be integrated at demo site and simulated in a virtual environment, included the identification/selection of a suitable demo site
- Specification of the test cases to be performed at demo site and simulated in a virtual environment, including the measurement and data acquisition programme
- Preparation of the demo site with acquisition of all the technologies/tools/elements that are involved in the test performance
- Test(s) execution
- Analysis of results, remarks, comments and recommendations

Μορφοποιημένο: Κουκκίδες και αρίθμηση

DEMONSTRATING EFFICIENT RO-RO LOADING/UNLOADING BY AGVS AND AUTOMATIC LASHING IN GENOA

Vertical WP 2
Task 2.4

Starting date: month ~~22~~**25** Duration: **1.5** month

Total Effort (MM): **24**

Partners involved	Task Leader	Effort (MM)
TTS	X	5
GRANFERRY		8
~~NDC~~DANAHER MOTION		11

Objectives

Μορφοποιήθηκε

Μορφοποιήθηκε

The objective is to demonstrate high performance Ro-Ro loading and unloading of cargo using AGV's and automatic lashing in Genoa.

Technologies/results from other research projects

Μορφοποιήθηκε

Μορφοποιήθηκε

The Ro-Ro concept was originally developed in the IPSI project.

Description

Μορφοποιήθηκε

The testing of the new technologies integration will be performed in the Port of Genoa.

Prior to testing the Ro-Ro operations, the area of the port where the testing is to be performed must be equipped with sufficient infrastructures for positioning and controlling the AGVs. This may include facilities for accurate GPS utilisation, or a transponder-based solution might be used.

The demonstration will be divided in two parts.

1. Two AGV's will bring 8 cassettes from a marshalling area on to a ship equipped with 2 x 100 lanes of IPSI kerbs, where the cassettes will be loaded/unloaded and lashed/unlashed automatically and then back again. The demonstration will be of one 6h cycle.

Μορφοποιημένο: Κουκκίδες και αρίθμηση

2. Tug masters will bring 7 trailers from a marshalling area on to a ship equipped with 2 x 100 lanes of IPSI kerbs, where the trailer equipped with IPSI trailer trestles will be loaded/unloaded and lashed/unlashed automatically and then back again. The demonstration will be of one 6h cycle.

Μορφοποιημένο: Κουκκίδες και αρίθμηση

The activities to be performed in this task are the following:

- Description of the various technologies to be integrated at demo site
- Specification of the test cases to be performed at demo site, including the measurement and data acquisition programme
- Preparation of the demo site with acquisition of all the technologies/tools/elements that are involved in the test performance
- Test(s) execution
- Analysis of results, remarks, comments and recommendations, including a description how to implement AGVs for existing container vessels and how to modify the vessel for optimal use of automatic loading and unloading systems.

Μορφοποιημένο: Κουκκίδες και αρίθμηση

DEMONSTRATING EFFICIENT TRANSHIPMENT CONTAINER TERMINAL OPERATIONS IN GIOIA TAURO		**Vertical WP 2 Task 2.5**
Starting date: month ~~24~~**26**	Duration: **1.5** month	Total Effort (MM): **43**
Partners involved	Task Leader	Effort (MM):
TTS	X	7
MEDCENTER CONTAINER TERMINAL		24
~~NDC~~DANAHER MOTION		11

Objectives

Adding a Ro-Ro terminal to an existing intercontinental container terminal to enable Ro-Ro feedering of containers to demonstrate complete port operations for a transhipment terminal for feedering purposes.
The objective of this task is to demonstrate that supporting the Gioia Tauro intercontinental container terminal with Ro-Ro feeder services provides a better utilisation of resources in the terminal.

Background

Feedering of containers from the large intercontinental container terminals leads to a situation where the large intercontinental container carriers and the smaller feeder ships compete for the same loading and unloading resources. By using Ro-Ro ships for container feedering, two positive effects are being achieved:

- The large cranes can be dedicated to serving the large intercontinental container carriers. This should lead to a better utilisation of resources (including reduced waiting time for the large ships).
- The cargo volume provided through Ro-Ro feedering may facilitate the establishment of new waterborne transport alternatives that may be utilised cargo currently using road transport. (Ro-Ro transport may handle all types of cargo units transported on land, while traditional container feeders are dedicated to transporting ISO containers).

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Description

Large intercontinental container terminals, such as Gioia Tauro, are normally dedicated to using large, efficient container cranes for loading and unloading the intercontinental container vessels as well as the smaller ships feedering containers to and from the terminal. This leads to a situation where waiting times occur, normally for the feeder vessels, since the large intercontinental vessels will be given priority.
This situation will tend to increase as the size of the intercontinental container vessels tend to increase.

A link will be established between the internal transport systems within the Gioia Tauro container terminal and the marshalling area of an IPSI Ro-Ro terminal for efficient transport of cargo directly from the container cranes or from the container storage area.

The IPSI Ro-Ro handling using conventional technology and AGVs will be used for the loading and unloading of the Ro-Ro vessel (only a limited number of lanes in the Ro-Ro vessel will be equipped with curbs, hence, conventional technology must be used as well).

A study of cargo streams to and from the Gioia Tauro terminal will be conducted as a step in the direction of establishing new Ro-Ro lines.

The demonstration will be divided in three parts.

1. Two AGV's will move cassettes between a marshalling area and a container crane, where containers will be loaded/unloaded. The demonstration will be one 6h cycle.

Μορφοποιημένο: Κουκκίδες και αρίθμηση

2. Two AGV's will bring cassettes from a marshalling area to the to the truck/rail service centre, where containers will be loaded/unloaded with either reach stackers or straddle carriers and then back again. The demonstration will be one 6h cycle.

Μορφοποιημένο: Κουκκίδες και αρίθμηση

3a. Two AGV's will bring 8 cassettes from a marshalling area on to a ship equipped with 2 x 100 lanes of IPSI kerbs where the cassettes will be loaded/unloaded and lashed/unlashed automatically and then back again. The demonstration will be one 6h cycle.

Μορφοποιημένο: Κουκκίδες και αρίθμηση

3b. Tug masters will bring 7 trailers from a marshalling area on to a ship equipped with 2 x 100 lanes of IPSI kerbs where the trailer equipped with IPSI trailer trestles will be loaded/unloaded and lashed/unlashed automatically and then back again. The demonstration will be of one 6h cycle

Μορφοποιημένο: Κουκκίδες και αρίθμηση

The main activities to be performed in this task are the following:

- Description of the various technologies to be integrated at demo site
- Specification of the test cases to be performed at demo site, including the measurement and data acquisition programme
- Preparation of the demo site with acquisition of all the technologies/tools/elements that are involved in the test performance
- Test(s) execution
- Analysis of results, remarks, comments and recommendations

Μορφοποιημένο: Κουκκίδες και αρίθμηση

<table>
<tr><td colspan="2">DEMONSTRATING INNOVATIVE TECHNOLOGIES FOR HIGH PERFORMANCES CONTAINER TRANSPORT</td><td>Vertical WP 2
Task 2.6</td></tr>
<tr><td colspan="2">Starting date: month 16 Duration: ~~3~~8 months</td><td>Total Effort (MM): 8.7</td></tr>
<tr><td>Partners involved</td><td>Task Leader</td><td>Effort (MM)</td></tr>
<tr><td>SARLIS Container Services</td><td>x</td><td>8.7</td></tr>
</table>

Objectives

To produce a new type of ~~design~~service for Ro-Ro/Container ships that allows them to accept whole trucks with containers giving them the possibility for door-to-door shipment and delivery, based on Vertical WP 1 solutions together with AGV or semiautomated solutions coming from the technology reviews.

Background

The transport of containers in the Mediterranean Sea is the theme of this Scenario in the route Valencia (SP)-Piraeus (GR).

~~In the case of fully booked SCS vessels or enquiries for services between ports not served by SCS, the enquiries can be forwarded to other shipping lines that can possibly be connected to the system at a later stage. Similarly, provisions should be made for bringing in insurance companies in the future as they play an increasingly significant role in the transport chain.~~

There are three basic characteristics that distinguish the transport of containerised cargo from that of other cargo types:

- in the case of containerised cargo a third physical entity is involved other than the ship and the cargo; the container itself, which requires a separate administration system
- the loading of containerships is a complex operation if container handling is to be kept to a minimum to reduce operating costs
- as most of the trade is performed on liner terms, the objective of „brokerage“ between demand and supply translates basically to coping satisfactorily with demand, often on very short notice, as well as to coping with higher than expected demand.

The following assumptions hold:

1. The consignee is in control of transporting the goods (ex factory terms of trade)
2. The selection of the road carriers at both ends of the journey is not made by the consignee
3. The enquiry for services comes from the consignee and not his agent
4. The cargo to be transported represents a full container load (FCL)
5. The containers to be used are not owned by the shipper or the consignee
6. There are no freight forwarders involved.

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Description

This Task will firstly evaluate the existing automated vehicles for loading and unloading of containers ships. The automated ~~rail~~ vehicle will be examined, together with the procedures, which are being used for loading and unloading and the type of ships, which could be used for this operation. Other systems will be examined if needed.

Secondly the service, which exists at the Valencia Piraeus route, will be evaluated. Both used technologies and organisation will be examined.

Ultimately a plan how to improve the service Valencia-Piraeus will be developed. Innovative handling technologies will be applied ~~and~~ in conjunction with new or refitted ships ~~will be designed~~ coming from the Vertical WP 1.

The proposed new design, that may also under specific circumstances be retrofitted on existing vessels, proposes the use in ships of storing spaces in multiple levels under deck as well as upper deck with a horizontal loading and unloading system. The innovation concerns the ability of the ship to be partially loaded and unloaded using ~~probably~~ built-in or additional (port) ramps contrary to today’s Ro-Ro ships that allow loading and unloading only from one point of the ship or existing container vessels that require port loading and unloading equipment. This will essentially blend existing container vessels with Ro-Ro ships and will have the following benefits:

1. The same truck-container car will be able to travel door-to-door from an inland point of shipment to its final destination. For example, a container load from Toledo (inland in Spain) will travel via the Valencia-Piraeus route to Lamia (an inland town in Central Greece).
2. The above-mentioned change will dramatically decrease the cost and the time of loading and unloading avoiding serious drawbacks, such as having the ship wait in a port until a crane is freed for its loading/unloading. It will decrease the risk and number of potential mistakes during consecutive loading/unloading procedures in the various transportation phases.
3. The same ship will serve more ports contrary to today’s practices.

This development scenario foresees modern, innovative construction solutions and ideas built upon the existing ship construction philosophy.

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

DEMONSTRATING EFFICIENT DRY PORT OPERATION IN LIVORNO		**Vertical WP 2 Task 2.7**
Starting date: month ~~17~~**3** Duration: ~~3~~**18** months		Total Effort (MM): ~~10~~**12**
Partners involved	Task Leader	Effort (MM)
SCIRO	X	~~3~~5
LogIT		1
Port of Livorno		6

Objectives

Μορφοποιήθηκε

Μορφοποιήθηκε

The short distance option covers the links between the port and inland terminals closer than 20 km. In this case, the realisation of a new dedicated pathway, or the utilisation after renewal of an existing connection (e.g., a railway link), and the operation by a private company that owns the line. The concept is based on the utilisation of automated vehicles, with higher a capacity than currently operated AGVs, capable of joining into "virtual" trains (i.e., not physically connected).

This Task deals with the detailed analysis of the Livorno case study. Performance of a logistic connection between the port area and an inland terminal will be simulated in Horizontal Task 1.5. The simulation will be fed with the relevant traffic data of the Port of Livorno, in order to check the viability of the proposed solution for short distance option. The connection will be granted through the autonomous railway vehicles, monitored and controlled by an overall control system, which produces missions to the vehicles and manages all the operation within the logistic connection. Investigation and determination of the main features and characteristics of the vehicles, accordingly the requirements expressed in terms of costs and throughput by the end users, supposing them to be ports rather then single terminals, unless otherwise specified and specifically needed, is also performed

Description

Μορφοποιήθηκε

Μορφοποιήθηκε

The concept is based on:

- A fleet of intelligent wagons
- A link between the port and the inland area
- An overall monitoring system, which gives missions and verifies that those are fulfilled properly.

Μορφοποιημένο: Κουκκίδες και αρίθμηση

In the dedicated link the vehicle will run in full automatic mode; for safety reasons, the vehicle will host room for an operator who will manually drive the vehicle in the port areas.
The wagon will be able to transport several cargo units and conditionings, such as: swap bodies, containers, bulk, steel coils, cars, etc.
The maximum speed would be 50 km/h.
The wagon would run on a dedicated railway line and infrastructure, so that no standards and regulation imposed by the UIC or national railways might apply; the same consideration applies for the signalling system. The wagon should couple seamless and contact-less with other wagons, to compose virtual trains.
All wagons would be monitored and controlled by a suitable control system.

The fulfilment of requirements will be analysed via a macro simulation in Horizontal WP1; the simulation tool will be fed with the relevant traffic data of the Port of Livorno, in order to check the viability of the proposed solution. In this case the simulation will be event based, in order to analyse the overall benefit relevant to the application of the proposed solution.

To perform the simulation of the Livorno case study, the description of the functional analysis of the full system (including the autonomous wagon, the traffic control system, the link control and the wagon control) is provided. The functional analysis will take into account the overall functions to be performed by the system and the functions to be provided by each subsystems, deep into the details as needed at this stage. This work will be particularly relevant for those components not planned to be developed in other research actions to fulfil the specific site requirements, such as the cockpit to manually drive the vehicle in non-restricted areas.

Financial analysis will be performed in order to determine an optimal solution between two different options: add electric engine to railcars making them autonomous, or develop a small unit to be attached or detached when necessary, making it available for any railcar operating in the port area. Moreover, the integration with the IPSI concept will be considered and added as an additional option.

Finally, the list of inputs, parameters, outputs and user interfaces will be defined at this level; this will be useful in order to determine the simulation working environment both at the configuration level, and at the running level.

ACHIEVEMENTS AND RESULT EVALUATION		**Vertical WP 2 Task 2.8**
Starting date: month ~~14~~**20**	Duration: ~~12~~**10** months	Total Effort (MM): **12**
Partners involved	Task Leader	Effort (MM)
CETENA	x	6
TTS		3
~~NDC~~DANAHER MOTION		3

Objectives

The objective is to evaluate the results of the work package and to ensure the quality of the results.

Description

The results and the achievements of the individual tasks will be properly evaluated.

The evaluation will be performed in parallel with the progress of each task, in order to be able to influence the task performance while the testing and integration is taking place.

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιήθηκε

VIRTUAL INTEGRATION AND VALIDATION

Horizontal WP 1

Starting date: month **1** Duration: **34** months

Total Effort (MM): ~~150.75~~**169.05**

Partners involved per task	T 1.1	T 1.2	T 1.3	T 1.4	T 1.5	T 1.6	MM
CETENA	~~1~~5.6	~~7~~6	20	18	12	~~10~~20	~~68~~81.6
IZAR	-			1		-	1
FINCANTIERI	-			1.5		-	1.5
TTS	-				4	-	4
SCIRO	1	1	7	7	~~22~~20	-	~~38~~36
LOGIT	-	~~1~~0.6	4.4	~~3~~1	~~3~~1	-	7
MEDITERRANEAN CONTAINER TERMINAL	-				~~1~~0.4	-	~~1~~0.4
GRANFERRY	-			~~3~~4.2		-	~~3~~4.2
DNV	-			0.25		-	0.25
~~NDC~~DANAHER MOTION				3			3
~~TFK~~BMT-TS	1					-	1
STRATHCLYDE UNIVERSITY	1	2		~~5~~7.6	~~8~~11.5	-	~~16~~22.1
SIR	-	~~1~~0.4	~~1~~6.6		~~5~~	-	7

Objectives

- To define objectives for all simulations
- To define standards and software architecture for reusability and interoperability of simulations
- To define Hw/Sw simulation test bed environment for visualising and operating simulations.
- To implement simulations of door-to-door multimodal transport chain for functional and economic evaluations
- To specify and implement models of existing and innovative technology components for virtual integrations purposes. This includes the new concept ship and ship-related technologies
- To perform, demonstrate and verify technological interoperability in various configurations and scenarios
- To simulate the manufacturing process of innovative ships

Description

Two types of simulations have to be set up for our purposes:

- **micro** simulations, that are mainly used for design purposes and, more in general, to study in detail through a real time simulation the behaviour of a 3D object with its functionalities and its relationships to other objects and to the environment.
- **macro** simulations, that are event-driven modelling processes enabling to evaluate - without simulating in real time the detailed behaviour of any single component - the performances of a complex system in terms of capacity, throughput and cost, under certain conditions and for various configurations. The same applies to high level simulations devoted to the economical evaluation of investigated sets of operations.

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Μορφοποιημένο: Κουκκίδες και αρίθμηση

The modelling of existing and innovative technologies, including the existing and new concept ships, involved in the various scenarios to be simulated is performed both individually and at 'systems' level. The measured performance parameters of such technologies are then used to configure the relevant models in the macro simulation environments. A number of micro simulations will be run, applying different conditions and combinations of cargo handling and transportation technologies to provide the macro simulation with various performance parameter sets.

Micro simulations of the case studies specified and eventually tested at demo sites in the vertical WPs are then performed; then also other alternatives are investigated through simulation.

The interaction/integration among the ship and either the terminal and the dry-port leads to another group of simulations to be implemented reusing and integrating simulation modules already implemented. The visualisation of these simulations results will also be used to verify and validate the technological solution proposed.

In order to evaluate the impact of the use of these technological solutions in a wider scenario, a door-to-door macro simulation approach will be implemented taking into account information and results coming from the simulations performed so far. Simulating the wider scenario characteristics as well, it will be possible to simulate the complete transportation chain of freight from the origin to the destination. The economical evaluation of the various configurations is then performed in an appropriated macro simulation environment.

This WP will thus have to ensure interoperability of simulations. In order to integrate and validate the considered technologies, a proper Hardware and Software simulation environment will be established and the most appropriate modelling and simulation tools (both for micro and macro simulation) will be defined, so that target operations may be properly modelled.

The WP is articulated in six Tasks, namely:

Task 1.1 Definition of objectives, standards and software architecture for all simulations.

Task 1.2 Test bed environment for visualising and operating simulations, and specification of interfaces to technology simulations for reusability and interoperability.

Task 1.3 Simulation of door-to-door multimodal transport chain.

Task 1.4 Definition and implementation of transport technologies models

Task 1.5 Simulation of technology interoperability (at demo sites and other selected scenarios)

Task 1.6 Simulation of ship manufacturing process

DEFINITION OF STANDARDS AND SOFTWARE ARCHITECTURE FOR ALL SIMULATIONS		**Horizontal WP 1 Task 1.1**
Starting date: month nr. **1**	Duration: months **2**	Total Effort (MM): ~~4~~**8.6**
Partners involved	Task Leader	(MM):
CETENA	x	~~1~~5.6
SCIRO		1
~~TFK~~BMT-TS		1
STRATHCLYDE UNIVERSITY		1

Objectives

Μορφοποιήθηκε

This Task will have to ensure interoperability of simulations.

Description

Μορφοποιήθηκε

Since this Task aims at harmonising and integrating Virtual Prototypes and/or Simulations of all technologies taken into account, a common and standardised interface among simulations has to be selected and specified to ensure interoperability and reusability of any simulated technology.
Each technological component will be defined through its input/output data and management information in the defined SW architecture.

The task final goal is to ensure at the end of the project to have a set of different simulations developed by different partners which will be comparable and whose models and results could be exchanged even if reached using different SW tools.

~~VR Architecture~~
~~HLA (DMSO) standard will be used for the definition and implementation of every federate. Participants will be able to connect to the simulation through a Local Area Network or a dial up connection.~~

~~Scenery Simulator~~
~~This federate will be responsible of communicating to the other federates the necessary information about to the terrain (in terms of orientation) and possible collisions that could occur with other vehicles or the scenery itself. The centralised control of collisions and terrain data is a necessary step to avoid data inconsistency throughout the simulation that could be originated from the local collision calculation.~~

~~Vehicles~~
~~Vehicle Federates will have to communicate to the RTI their desired position, waiting for the Scenery Simulator to allow the requested movement; they will communicate all other relevant data (defined in the FED file) with each other or the other involved federates.~~

~~Visualisation Federates~~
~~Visualisation will be performed locally, with every participant using the chosen tool. The Visualisation Federates will receive the position attribute from every federate in order to display all the vehicles and other federates.~~

SIMULATION TEST BED ENVIRONMENT FOR VISUALISING AND OPERATING SIMULATIONS		**Horizontal WP 1 Task 1.2**
Starting date: month nr. ~~3~~**1** Duration: months ~~4~~**12**		Total Effort (MM):~~12~~**10**
Partners involved	Task Leader	(MM):
CETENA	X	~~7~~6
SCIRO		1
LOGIT		~~1~~0.6
STRATHCLYDE UNIVERSITY		2
SIR		~~1~~0.4

Objectives

Μορφοποιήθηκε

In order to integrate and validate the considered technologies, a proper Hardware and Software simulation environment has to be established and the most appropriate modelling and simulation tools (both for micro and macro simulation) will be defined, so that target operations may be properly modelled.

Description

Μορφοποιήθηκε

Μορφοποιήθηκε

Based upon the technological models developed as well as the SW architecture defined, a proper HW configuration will be selected and set up by each partner based on its own tools.

The various visualisation and simulation SW tools to be adopted will be embedded in such a HW configuration.

HW Requirements
Hardware characteristics for the vehicle simulators have to be defined on the basis of the vehicle models computational requirements. As far as the visualisation is concerned, every participant will set up a dedicated hardware architecture whose computational capability will be adequate to the chosen scenery complexity level.

SW Requirements
~~DMSO's HLA will be t~~The software architecture to be used in implementing the simulations will be defined by each partner according to its own tools and expertise, following the indications from WP H1 task 1 to ensure that the different simulations will be comparable and that models and results could be exchanged. As far as the visualisation tool is concerned, it will be handled by a visualising software like Vega, Maverick or CG[2], according to the partners' preferences. ~~If different tools will be chosen by the partners, one aspect to insure will be the use of the same scenery file for all the visualiser federates.~~

SIMULATION OF DOOR-TO-DOOR MULTIMODAL TRANSPORT CHAIN		**Horizontal WP 1** **Task 1.3**
Starting date: month nr. ~~7~~**16** Duration: months ~~28~~**14**		Total Effort (MM): ~~28~~**38**
Partners involved	Task Leader	Effort (MM):
CETENA	x	20
SCIRO		7
SIR		~~1~~6.6
LOGIT		4.4

Objectives

In order to evaluate the impact of the use of identified technological solutions in a wider scenario, a door-to-door macro simulation approach will be implemented taking into account information and results coming from the micro simulations performed. Simulating the wider scenario characteristics as well, it will be possible to simulate the complete transportation chain of freight from the origin to the destination.

Μορφοποιήθηκε

Μορφοποιήθηκε

Description

Routes and scenarios best suited to demonstrate the feasibility of the integrated door-to-door cargo transport using the member technologies are defined and the types and amount of cargo flow are determined in Horizontal WP 3 Task 1.1. The characteristics of the transportation system currently in place for the routes are also studied. Data related to the interface nodes, and pertinent to the scenarios are to be collected.

Interrelationships between the physical flow, the information flow and regulation-related procedures will be covered in this task. A model for the total system architecture will be presented, with the aim of visualising recommendations for the information transfer architecture of the port and the ship, including communication techniques, information technologies and routines, and regulatory amendments to support efficiency.

These macro simulations will be useful to evaluate how the innovative suggested solutions might impact on the whole intermodal transportation system, pointing out possible bottlenecks and inefficiencies.

Also economic evaluations could be performed through these simulations. The results of these simulations will be evaluated and compared to similar transportation chains considering current transport alternatives.

Μορφοποιήθηκε

Μορφοποιήθηκε

DEFINITION AND IMPLEMENTATION OF TRANSPORT TECHNOLOGIES MODELS		**Horizontal WP 1 Task 1.4**
Starting date: month **8**	Duration: months **19**	Total Effort (MM): ~~41.75~~**43.55**
Partners involved	Task Leader	(MM)
CETENA		18
IZAR		1
FINCANTIERI		1.5
SCIRO		7
LogIT	x	~~3~~1
GRANFERRY		~~3~~4.2
DNV		0.25
~~NDC~~DANAHER MOTION		3
STRATHCLYDE UNIVERSITY		~~5~~7.6

Objectives

Μορφοποιήθηκε

The cargo handling technologies, tools and systems involved in the demo site experiments, both existing and to be built, are simulated in a proper simulation environment for performance evaluation and to be used for the assessment of their integrability at virtual level.

The purpose of this task is to develop a library of models of those technologies that are used by or provided in the Integration project. In addition, models of emerging technologies might be developed as they become available throughout the Integration project.

Graphic Models Development
Drawings and descriptive information will be used to develop 3D models of the involved vehicles and moving objects. The chosen complexity level will be a satisfying tradeoff between computational load required to display the vehicle without slowing the simulation and the faithfulness of the representation.

Motion Models Development
Motion characteristics will be collected from existing product documentation and other Integration activities; vehicle behaviour models will be developed with a strong link to their 3D representation.

Simulation / Visualisation Tools
The tools chosen in Task 1.2 will be capable of combining the visual and behavioural characteristics of the desired vehicles; moreover, it will provide visual effects to highlight possible problems connected with the vehicles' joint motion and cooperation.

Description

In this Task, the models for all the relevant Integration technologies will be developed.

This includes:

- the ship and its immediate surroundings (CETENA)
- cargo handling systems (quay cranes, lifts, carriers, AGVs including navigation and control system, ….), cargo units (cassettes, pallets, containers), transportation means (wagons, trucks, etc.) (The remainder of the participants).

The graphic models will be developed on the basis of drawings and other descriptive information available for background technologies and those technologies provided in the Integration project.

The basis for the movement descriptions will partly be from the available product documents and from Integration activities. One such example is the AGV kinetic capabilities that will be derived form the simulation tool that is used for the development of the AGV control system.

The simulation / visualisation tool(s) to be used has to be selected in Task 1.2 need to have the capabilities of combine a suitable representation of 3D geometric models and the associated kinetic properties of the relevant technologies.
Furthermore, the simulation tool should be flexible and efficient in enabling the modelling of a new area of operation, the operational constraints, and to combine the applicable technologies in such a way that complete, integrated solutions may be simulated.

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

SIMULATION OF TECHNOLOGY INTEROPERABILITY		Horizontal WP 1 Task 1.5
Starting date: month **20**	Duration: **14** months	Total Effort (MM): **55**
Partners involved	Task Leader	Effort (MM)
CETENA	X	12
TTS		4
SCIRO		~~22~~20
LogIT		~~3~~1
MEDITERRANEAN CONTAINER TERMINAL		~~1~~0.4
STRATHCLYDE UNIVERSITY		~~8~~11.5
SIR		~~5~~

Objectives

Μορφοποιήθηκε

Μορφοποιήθηκε

The objective of this task is to simulate integration of the different technologies that are used or developed in the Integration project. The simulation of the relevant simulation processes will be shown as a 3D visualisation whenever required, or visualisations as timing tables and 2D aerial view will be used.

The purposes of the simulations are:

- To assess the performance of the integrated technologies
- To illustrate combinations of technological elements that will not be integrated in the Integration physical demonstrators.
- To verify integrability between technological elements (as specified in Horizontal Workpackage 2)
- To provide virtual simulations of the three Integration demonstration sites (Gioia Tauro, Gothenburg, and Genoa), and Piraeus-Valencia (where virtual simulation will be used to illustrate the high performance connection for containers between these two ports) and Livorno (where virtual simulation will be used to illustrate the link between an efficient port terminal and a "dry port" – an inland freight village). The task also allows the simulation of one other scenario more, which will be defined in Vertical Task 1.8.

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Description

Μορφοποιήθηκε

Μορφοποιήθηκε

Each of the sites to be demonstrated will have to be modelled in the form of:

- A 3D description of its layout,
- The pathways in which the different technological elements might move,
- The strategy for linking the different technological elements together in such a way that the individual technological elements are combined into complete cargo handling systems.

Μορφοποιημένο: Κουκκίδες και αρίθμηση

The simulation tool(s) to be used has to be selected in Horizontal WP1, Task 1.2 and need to have the capabilities of combine a suitable representation of 3D geometric models and the associated movement properties of the relevant technologies.
Furthermore, the simulation tool should be flexible and efficient in enabling the modelling of a new area of operation, the operational constraints, and to combine the applicable technologies in such a way that complete, integrated solutions may be simulated.

Prior to establishing this integrated model, the definition of the case studies and the associated rules for implementation must be established.

There will be site simulations of:

- The ship-shore systems identified in the WP V1 task 1 activities - Cetena

- The port terminal of Gioia Tauro - Cetena
- The port of Gothenburg - Danaher + LogIT + TTS + Strathclyde University
- The port of Genoa - Cetena
- The ~~two ports of Tessalonikki and Valencia~~ Piraeus case study - Cetena
- The dry port establishment of Livorno – Sciro

- Another case study that is to be defined by Vertical Task 1.8

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Μορφοποιημένο: Κουκκίδες και αρίθμηση

The simulations will be as close to the physical demonstrations as possible, in order to be able to calibrate the models to the real demonstrations

Once the calibration is made, possible technology replacements might be introduced in order to evaluate the effect of the different type of technologies. One example of such a replacement is, in one simulation "run" to use the AGVs for loading and unloading a vessel and in another to replace the AGVs with the use of translifters and tug masters.

SIMULATION OF SHIP MANUFACTURING PROCESS		**Horizontal WP 1** **Task 1.6**
Starting date: month nr. ~~7~~**11** Duration: ~~7~~**14** months		Total Effort (MM): ~~10~~**20**
Partners involved	Task Leader	(MM):
CETENA	x	~~10~~20

Objectives

Μορφοποιήθηκε

Μορφοποιήθηκε

To realise a model of the shipyard manufacturing process and to simulate the hull production process of the INTEGRATION new concept vessels, in order to assess and compare performances of the production process for the various design alternatives.
The main objective of the task is to optimise the production process and to reduce ship production costs.

Description

Μορφοποιήθηκε

Μορφοποιήθηκε

The simulation tool(s) to be used for these macro simulations are event-driven process modelling tools that simulate the performances of the manufacturing system.
These tools are based on logical-mathematical models specifically realized to simulate ship production process.
This kind of models is able to monitoring the whole production process and the related parameters, and to highlight bottle-necks.
After model realizing and validating, it can be integrated in a software tool able to managing input and output data and the simulation runs.
This tool will be employed in the optimisation loops performed in Vertical WP 1.5, in the aim to obtain the best ship design in the point of view of the production costs.

Simulations will be developed based on the solutions studied in WP vertical 1 task 5, the RoPax solution A2 and 3 different alternatives of the RoRo solution A4 (the alternatives will be either different A4 sizes or different manufacturing alternatives for the first studied solution, the 1600 TEU).

TECHNOLOGICAL INTEGRATION						**Horizontal WP 2**
Starting date: month **2** Duration: **27** months						Total Effort (MM): **15**
Partners involved	T2.1	T2.2	T2.3	T2.4	T2.5	MM
LogIT	2	7	1	3	2	15

Objectives

The objective of this workpackage is to ensure the integration of technologies across the vertical workpackages (WP 1, WP 2) of the project.

Background

The project Integration is about integrating technologies that ensures the establishment of efficient door-to-door transport operations using waterborne transport as a crucial element.

The Integration will be using a combination of available technologies and technologies that will be developed in the vertical work packages 1 and 2 in the Integration project. The success of the Integration project depends upon the ability to integrate these technologies into smoothly operating cargo transportation systems.

This workpackage is responsible for making sure that the external interfaces of all the background technologies are specified in order to function as a baseline for the new technologies to be developed in the Integration project. In addition, this workpackage will interact with the vertical work packages such that the external interfaces of the newly developed technologies are properly specified, that they satisfy the requirements for integration with the baseline technologies, and that the development activities are not allowed to deviate from these requirements.

Description

The Horizontal workpackage 2 is articulated in various Tasks, namely:

Task 2.1 Establish baseline for integration

Task 2.2 Identify potential gaps and new opportunities

Task 2.3 ~~Audit development and integration~~ Monitor integrability of test results into simulations

Task 2.4 Specify tests and monitor testing

Task 2.5 Document test results, assess integrability

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Μορφοποιημένο: Κουκκίδες και αρίθμηση

ESTABLISH BASELINE FOR INTEGRATION		**Horizontal WP 2 Task 2.1**
Starting date: month **2**	Duration: **25** months	Total Effort (MM): **2**
Partners involved	Task Leader	Effort (MM):
LogIT	X	2

Objectives

The objective is to establish external specifications for all available technology components.
This must be done in order to document the way in which the new technological components need to interact with the ones that provide the starting point for the activities.

Technologies/results from other research projects

All technologies used as background for the Integration demonstrations

Description

The purpose of Integration is to apply existing technologies and to integrate them into new, innovative transport solutions. In order to be able to integrate, the external interfaces of the background technologies must be described in such a way that the new developments (or modifications) that need to be performed in Integration may be performed in such a way that these external interfaces are being utilised properly.

These external interfaces shall be described in this task.

The method of description will be a combination of geometric models and written reports.

Much of the practical modelling and descriptive work will be performed within the vertical work packages.

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιήθηκε

<table>
<tr><td colspan="2">IDENTIFY POTENTIAL GAPS AND NEW OPPORTUNITIES</td><td>Horizontal WP 2
Task 2.2</td></tr>
<tr><td colspan="2">Starting date: month 4 Duration: 25 months</td><td>Total Effort (MM): 7</td></tr>
<tr><td>Partners involved</td><td>Task Leader</td><td>Effort (MM)</td></tr>
<tr><td>LogIT</td><td>X</td><td>7</td></tr>
</table>

Objectives

Μορφοποιήθηκε

The objective is to identify the gaps that need to be filled in order to ensure proper integration of the different technological components to be used in the project. Furthermore, new opportunities should be investigated and their implications should be assessed.

Description

Μορφοποιήθηκε

An in-depth analysis will be made in order to assess those gaps that need to be filled in order to ensure full integration of the technological building blocks to be used in the Integration project.

The analysis will be made in close cooperation with the vertical workpackages 1 and 2.
Most of the detailed specifications and all the technical work are performed in the vertical workpackages. However there might be the need to develop for instance an AGV, which is able to make curves.
The eventual development of this AGV, or another tool to load/unload automatically existing, refitted Ro-Ro vessels, will be performed by this Workpackage to specification level.
Specifications for virtual simulations should be provided to Horizontal Task 1.4.

Furthermore, the “Industrial Advisory Group” and “Technology Provider Group” will be approached in order to identify new technological opportunities that should be taken into account when preparing the integration and the integration testing.

~~AUDIT DEVELOPMENT AND INTEGRATION~~ MONITOR INTEGRABILITY OF TEST RESULTS INTO SIMULATIONS		**Horizontal WP 2 Task 2.3**
Starting date: month **5** Duration: **25** months		Total Effort (MM): **1**
Partners involved	Task Leader	Effort (MM)
LogIT	X	1

Objectives

~~The objective is to audit the development in the vertical work packages in order to ensure that the development does not deviate from the specifications defined in Horizontal task 2.1 and Horizontal Task 2.2.~~The objective is to ensure that the tests are carried out in a consistent way and that the performance is measured in a way that it can be used as input and verification for the simulations and other capacity calculations.

Description

~~Participation in review meetings throughout the development.~~ The activities are strongly focused on the integration between the WP V2 results (experimental testing) and the WP H1 requirements (simulation input), guided by the WP V1 Task 1 choices concerning ship-shore system solutions.

The following activities will be performed:

- Assisting in specification of demonstration and testing program for vertical WP V2
- Assisting TTS in the test lay-outs
- Initiation of risk and safety analysis
- Participation in AGV simulation meeting
- Detailed time study of RoRo cargo handling operation
- Assisting to tests and tests evaluation

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιήθηκε

ASSESS TEST INTEGRABILITY AND MONITOR TESTING		**Horizontal WP 2** **Task 2.4**
Starting date: month **20**	Duration: ~~6~~**9** months	Total Effort (MM): **3**
Partners involved	Task Leader	Effort (MM)
LogIT	X	3

Objectives

Μορφοποιήθηκε

It is of imperative importance for the Integration project that all relevant technologies may be integrated into proper transport chains, independent upon location.
The purpose of this task is to specify the tests to be performed to ensure that integration is complete and efficient and to monitor these tests.

Technologies/results from other research projects

Description

Μορφοποιήθηκε

Use information from the Vertical WP 1, the test specification of Vertical WP 2 and information from Horizontal Task 2.1 and Horizontal Task 2.2 as a basis for assessing integrability at the demo-sites.
Test specifications will be adjusted where needed.

When these test specifications are completed, they will be handed over to the respective vertical workpackages to guide the integration testing.

These tests will then be audited.

EVALUATION OF TEST RESULTS, ASSESS INTEGRABILITY		**Horizontal WP 2** **Task 2.5**
Starting date: month **22**	Duration: ~~4~~**7** months	Total Effort (MM): 2
Partners involved	Task Leader	Effort (MM):
LogIT	X	2
Objectives The objective is to record the results of the integration tests at the various demonstration and test sites and assess to which extent the technologies might be integrated.		
Description The test results from Vertical Task 2.8 will be evaluated and the results of the evaluation will be documented. The results will be extrapolated to the level of the potential of system integrability.		

ASSESSMENT, IMPLEMENTATION AND EXPLOITATION

Horizontal WP 3

Starting date: month 1 Duration: **36** months

Total Effort (MM): ~~127.95~~**141.1**

Partners involved	T 3.1	T 3.2	T 3.3	T 3.4	T 3.5	T 3.6	T 3.7	T 3.8	MM
CETENA	~~5~~3.8	5	3	2		4	2	~~5~~4.5	~~26~~24.3
IZAR			1					1	2
FINCANTIERI	2	3	1					1	7
TTS		0.5	0.5	0.5				0.5	2
BMT	~~2~~1.5	~~3~~8.7						1	~~6~~11.2
LOGIT		1						0.7	1.7
MCT		1	~~1~~0.5					0.9	~~1.9~~2.4
~~DFDS~~STORA ENSO			1					1	2
GRANFERRY			1					1	2
DNV	0.25	0.5							0.75
~~NDC~~DANAHER MOTION				1				1	2
~~TFK~~BMT-TS	1.2					6			~~6~~7.2
SSPA	~~2~~0.5	1	~~14.4~~9.2					0.6	~~17~~11.3
STRATHCLYDE UNIV.								1	1
CTO	~~2~~6	~~1~~3.3						~~0.5~~1	~~3.5~~10.3
PORT OF LIVORNO								0.4	0.4
SIR								1	1
VNSI				4.9					4.9
NESTEAR	10					3	3		16
NTUA		~~5~~5.6	1		15			3.8	~~23.8~~25.4
SSS	4.25							1	5.25
PORT OF GOTHENBURG								1	

Objectives

This WP aims to:

- Improve continuously the market and available technologies scenario in order to update the reference

Μορφοποιήθηκε

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

competing solutions and benefit from new market and technological opportunity.

- Describe the European scenarios for freight traffic flows and identify the opportunities for maritime transport to play a greater role. Alongside the definition of transport demand, an overview of emerging technologies that can improve multi-modal transport chains will be delivered. Finally the benefits and disadvantages of potential solutions will be reviewed with regard to their impact on the efficiency of the multimodal transport chain.
- Verify the work in progress in order to have the required transfer of results from one technical Task/Work Package to the other. Evaluate the quality of the results obtained from technical point of view (performances/time/costs/impact) to properly make the choice for virtual simulation exercises and for exploitation and dissemination activities, to stimulate spin off to industries.
- Exploit results as soon as available, in order to adopt new solutions at the earliest time, and prepare on the base of validated results the conditions, when longer time is required for innovation

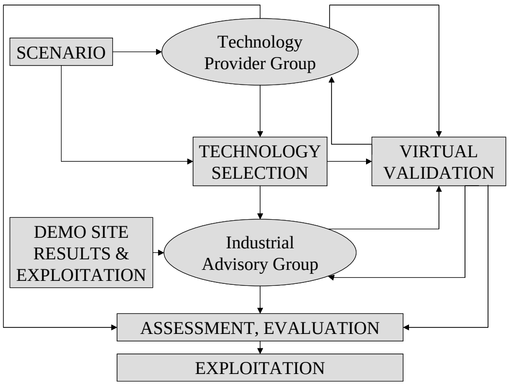
Description

Μορφοποιήθηκε

This WP generates the input to all technological activities and the reference scenarios for the future SSS market. These reference scenarios allow identification of technological needs as well as the industrial demand of enabling technologies to facilitate multimodal transport competitiveness and satisfy the quantitative market requests.

The WP is subdivided in eight Tasks

Task 3.1	Door to door freight transport scenarios
Task 3.2	Enabling technologies
Task 3.3	Industrial Advisory Group
Task 3.4	Technology Provider Group
Task 3.5	Validation by the Logical Framework Matrix approach
Task 3.6	Impact of new technologies on the effectiveness of door-to-door intermodal transport
Task 3.7	Monitoring, assessment, evaluation and implementation
Task 3.8	Exploitation & dissemination



This WP enables the interaction of INTEGRATION Consortium, during the project development, with the external world, operators, industries, technology providers, final users to continuously update the scenario of available technologies, to be taken into account in the virtual validation scenario, to follow the evolution of market demand and society needs. A continuous spin off is envisaged and through the interaction of INTEGRATION with the industries by the Industrial Advisory Group, and the assessment of the compliance to the industrial interests and needs will be also performed.

DOOR-TO-DOOR FREIGHT TRANSPORT SCENARIOS		**Horizontal WP 3 Task 3.1**
Starting date: month nr **1** Duration: ~~22~~**24** months		Total Effort (MM): ~~23.25~~**36.86**
Partners involved	Task Leader	Effort (MM):
CETENA		~~5~~3.8
FINCANTIERI		2
BMT		~~2~~1.5
BMT-TS		1.2
DNV		0.25
SSPA		~~2~~0.5
CTO		~~2~~6
NESTEAR	x	10
SSS		4.25

Objectives

Μορφοποιήθηκε

Development of European door-to-door freight transport scenarios. Interpretation of future demands and the application and impact of new enabling technologies.

Background

Μορφοποιήθηκε

Expertise in subjects and disciplines like value chain management, organisational change management, distribution management, logistics, macro-economics, econometrics, foresight, scenario building (EU project EVIMAR methodology and techniques, are made available to the project and used to enhance and leverage the proposed project).

Description

Μορφοποιήθηκε

Definition of trade flows relating to present-day assumptions, postulation of future scenarios, and analysis of maritime elements in transport chain.

- Trade flows and Origin - Destination matrices (O/D matrices)
- Reference scenarios
- Multi-modal chains in relation to major Short Sea Shipping (SSS) routes

Μορφοποιημένο: Κουκκίδες και αρίθμηση

To develop a “reference scenario” for EU trade and transport in order to identify and characterise the major SSS routes in Europe. The aim will be to estimate their potential growth and to specify the conditions of competition between the different modes.
To provide an overall socio-economic framework for European transport evolution, within which improvements in marine technologies can be assessed in terms of their potential to change the modal split.

Activities:

A) Trade flows and characterisation of the present situation

At a first level, an analysis of the trade between countries using the EUROSTAT and COMEXT databases will be undertaken. This will provide a differentiation between products and, for example, identify the relative importance of products such as petroleum products, major bulk industrial products (agriculture, chemistry, iron ores, coal, minerals) refrigerated products and dangerous goods that will require different consideration from unitised and containerised cargoes. For example, these types of transport require specific logistics and monitoring systems during transport, transhipment and storage.

A second level of analysis will be a geographical breakdown on a Nuts II level, as it has been performed in the SCENES and EUFRANET projects in order to focus on the circumstances when inland and maritime intermodal transport can be in competition. The results obtained will be compared to ports statistics: this is an important and original, output which has been attempted for only a small number of ports in Europe (INFOSTAT project) but can be generalised for the major routes of interest from northern and southern Europe and used to cross compare between the two regions.

At this stage the traffic breakdown for major categories of products is necessary to consider the different logistic constraints and transport organisation needs. This will be performed for major, strategic, SSS routes (the exercise for all O/D combinations is beyond the scope of this task), for a more accurate analysis of the impact of technological changes.

To create the required background for the activity a detailed study of the present situation concerning ports, including interland connections, and services will be performed at a main-zone level.
Four main areas are identified:
Baltic Sea – CTO;
North Sea – BMT-TS;
Atlantic – Nestear;
Mediterranean and Black Sea – Cetena / SSS.

B) The “reference” and “alternative” scenarios

The “reference” scenario will be a “trend” scenario based on past evolution. The trend concerns developments in the socio-economic external environment and also the evolution of modal split. Additionally, an “alternative” scenario can be postulated, predicated on expected changes in maritime intermodal transport chains due to introduction of major technologies.

The definition of the reference scenario will be based on methodologies developed in the SCENARIOS and SCENES projects. The application of the trend hypothesis will be done at a regional level (NUTS II) in order to give a more precise idea of the evolution of flows related to maritime traffic.

The components of the scenarios are:

a) external variables

Μορφοποιημένο: Κουκκίδες και αρίθμηση

- demographic data per NUTS II (regional level)
- GVA per regions and for major types of activities (agriculture, industry, services…)
- Trends of regional exchanges

Μορφοποιημένο: Κουκκίδες και αρίθμηση

b) internal transport variables

Μορφοποιημένο: Κουκκίδες και αρίθμηση

- evolution of prices or costs per mode
- evolution of pricing and taxation policies

Μορφοποιημένο: Κουκκίδες και αρίθμηση

For European integration (and openings to western and Mediterranean areas), an alternative hypothesis can consider the expected economic and trade growth per region (a distinction is here drawn between EU countries, CEEC countries and Mediterranean countries). For this purpose, TINA prospective analysis (CEEC countries) and Mediterranean scenarios can be used (Mediterranean scenarios of SCENES and also SCENARIOS of UNDP in Plan Bleu for Mediterranean countries).

C) Intermodal chains and modal split on major routes

The output of this activity will be traffic reference per mode for the major relations concerned.

Mode performances that are initially defined will be changed at a later stage with input from the technologies implementation studies.

For intermodal chains the reference hypothesis must take into account the costs of the different segments of the chain for the categories of products above defined. The breakdown will be into maritime transport, transhipment, and inland transport. Using IQ results some estimation can be made for maritime containers.

Quality factors have to be considered in relation to cost. Performance factors impinging on quality of service include time, reliability, safety and flexibility (adaptation to specific logistic requirement). Information technologies (e.g. tracking and tracing) have an important influence on these factors. The importance of such factors on the "utility function" of shipping has been tested in several state preference surveys (e.g. EUFRANET and transalpine studies in France) so as to estimate modal choice. Such approaches can be used to help understand competition issues between maritime and land routes (although at this stage a specific survey is not proposed).

Μορφοποιήθηκε

D) Selection of intermodal chains to be investigated in the project

The intermodal chains to be investigated in the project and where new technologies should be applied are then selected according to geographical/trade volumes considerations.

ENABLING TECHNOLOGIES		**Horizontal WP 3 Task 3.2**
Starting date: month **1**	Duration: **26** months	Total Effort (MM): ~~19~~**29.6**
Partners involved	Task Leader	(MM)
CETENA	X	5
Fincantieri		3
TTS		0.5
BMT		~~3~~8.7
LogIT		1
MCT		1
DNV		0.5
SSPA		1
CTO		~~1~~3.3
NTUA		~~5~~5.6

Objectives

Μορφοποιήθηκε

Μορφοποιήθηκε

Identification of door-to-door freight transport emerging technologies for the ship and cargo handling systems.

Background

Μορφοποιήθηκε

~~The most recent techniques and methodologies for innovation and subsequently wealth creation are applied to conceptualise most efficiently design solutions:~~

Μορφοποιημένο: Κουκκίδες και αρίθμηση

- ~~Metamorphosis theory~~
- ~~Brainstorming, delphi- and focus group approaches are capitalised on~~
    - ~~Innovation model orientation~~
    - ~~Strategic-systemic approach~~
    - ~~Process based development~~

Technologies of possible interest to the projects, existing or upcoming, have to be taken into consideration by the Consortium and further investigated.

Technologies/results from other research projects

Μορφοποιήθηκε

Μορφοποιήθηκε

Expertise from activities such as *Enisys, Logiship, PolCorridor, LogChain, Container Express, Seaway @ 2010, Marvin, Wondermar, Themes, Treship, EPC, IPPA* and other similar logistics/inter modal/communication projects and thematic networks are benefited from in the prescribed work

Description

Μορφοποιήθηκε

The main activities of this Tasks are:

A) Functional requirement and mission profiles

Μορφοποιήθηκε

Μορφοποιήθηκε

This activity will address the ~~N~~need to know what operations are needed with relevant time and cost.
According to the of Door to Door freight transport flows and the most significant multimodal chains, the requirements for technologies, with specific reference to interoperability between ship and land-based modes are defined.
Requirements are relevant to time and cost for the maritime transport, the terminal operation, and the transhipment. The need for infrastructures and their impact on the port and terminal organisation and on safety and environment issues is considered.

B) Technology needs and requirements

This activity aims at identifying the technological ‘function’ that could satisfy the above functional requirements. The technologies that could perform such a ‘function’ could be either existing or innovative or a combination at system level of various technological components.

C) Existing technology review

Μορφοποιήθηκε

A number of technologies have been and are continuously developing for improved integration of maritime transport into door-to-door transport chains. Some have been developed through EU supported R&D projects and others through more proprietary channels. The purpose of this activity is to screen available and emerging technologies and to produce a candidate list of technologies and their detailed characteristics, for consideration in this project.
This activity will be closely coordinated with the efforts of Vertical WP 1 and 2 and specifically the technologies will be divided into corresponding categories:

- Ships
- Sea ports / terminals
- Sea - land interfaces (including inland port extensions)

Μορφοποιημένο: Κουκκίδες και αρίθμηση

On the basis of the previous requirements the choice of the most suitable systems will be performed having in mind the operating cost reduction and the environmental impact.
~~Review of emerging technologies relevant to maritime transport in a door-to-door context.~~

D) ~~Technology market demand~~Integrated Information Systems Research

Μορφοποιημένο: Κουκκίδες και αρίθμηση

~~For the most promising technologies, relevant to the ship herself and to the port/terminal considered in the Project for the case studies, both performed at demo sites and simulated in a virtual environment, thus also including those that have been implemented/adapted within the Project (i.e. New concept ships, innovative cargo handling systems, etc.), the market potential is evaluated.~~
All integrated transport systems require integrated information to operate effectively. An integrated transport system involving a water-borne leg inevitably leads to additional mode switches and complexity.
The research into new ship concepts and efficient port terminal operations aims to minimise this complexity by new hardware solutions.
It is also necessary to minimise the complexity of the supporting information systems. For short sea shipping to become “Motorways of the Sea” then the information systems must match the functionality and efficiency of those that support “Motorways of the Land”.
By reviewing the technologies that are being developed and by identifying the emerging technologies that will deliver the most benefit, the research aims to show how this can be done.

ADVISORY GROUP ACTIVITY		**Horizontal WP 3 Task 3.3**
Starting date: month **1** Duration: **36** months		Total Effort (MM): **22.9**
Partners involved	Task Leader	Effort (MM):
CETENA		3
IZAR		1
Fincantieri		1
TTS		0.5
MCT		~~1~~0.5
~~DFDS~~STORA ENSO		1
GRANFERRY		1
NTUA		1
SSPA	x	~~14.4~~9.2

Objectives

The aim is to continuously interact with the external world and the stakeholders such as Maritime administration, operators, industries, during the project development in order to assess the compliance to the stakeholders’ interests, needs and constraints.

Description

Μορφοποιήθηκε

The ADVISORY GROUP members include a representative of partners and associated that both have industrial products to market and final users.
~~In addition a number of external members, including at leas two Maritime Administrations, will be invited to join the Group.~~
The activity is to monitor the project progress, and to advise about the compliance of the results to the stakeholder’s interests, needs and constraints.

The external world advises will be collected by the Advisory Group through two different activities:

- interviews with stakeholders conducted by SSPA during the first project half;
- two Advisory Group meetings organised during the second half of the project by NTUA and chaired by SSPA (meeting 1) and Cetena (meeting 2).

Interviews and meeting will generate reports including all input coming from internal members and external guests.
~~All Members are expected to provide a written deliverable that will be collated into a unique report by the Task Leader.~~

TECHNOLOGY PROVIDER GROUP ACTIVITY		Horizontal WP 3 Task 3.4
Starting date: month **1**	Duration: **24** months	Total Effort (MM): **8.4**
Partners involved	Task Leader	Effort (MM):
CETENA		2
TTS		0.5
~~NDC~~DANAHER MOTION		1
VNSI	x	4.9

Objectives

The Technology Provider Group aims at stimulating the adoption in the project of innovative technological solutions that are likely to have effective market potential.

Another objective is to involve the technology owners interested in promoting technologies that are close to the market, or can widen the market through integration in the multimodal transport chain as in the INTEGRATION project, or can be transferred by other industrial sectors.

Description

Μορφοποιήθηκε

Μορφοποιήθηκε

Technology Provider Group is composed by Members, all Partners and Associated Partners involved in the Consortium, owner of technologies ready for integration, the WP Leader and the Project Coordinator.
Associated Members will be accepted to join in the Technology Provider Group, after acceptance by the orignal members.
The Technology Provider Group selects technologies for virtual validation and integration.
Associated members should present to the Technology Provider Group their own available technologies and propose virtual validation exercises.

The activities will be carried on by:

- visits to sites implementing interesting exploitable technologies;
- one Technology Provider Group workshop to be organised by VNSI at the end of the second year of the project.

Focus during the second half of the project will be set on specific key aspects identified in the developed systems.

VALIDATION BY THE LOGICAL FRAMEWORK MATRIX APPROACH		**Horizontal WP 3 Task 3.5**
Starting date: month nr. **18** Duration: **13** months		Total Effort (MM): **15**
Partners involved	Task Leader	(MM)
NTUA	x	15

Objectives

This task will define proper validation exercises including defining:

- The context
- The scenario
- The validation criteria

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Then it will assess and evaluate the results of Vertical Task 2.6 and possible other Tasks.

Description

Μορφοποιήθηκε

The list of validation criteria for this project is really open ended. The following is a non-exhaustive sample. One or more of the following should be demonstrated:

- compliance with the broad objectives of the Common Transport Policy
- removal of bottlenecks or other obstacles that hamper logistical efficiency
- relief of land-based networks from congestion
- promotion of European trade competitiveness
- technologies, policies and/or procedures that improve interoperability
- cost-effective scenarios by which cargoes can be shifted from land to sea
- measurable improvements in logistical efficiency (properly defined)
- enhancement of connectivity land cohesion of peripheral and less developed regions
- sustained mobility
- achievement of higher safety and/or environmental friendliness

Μορφοποιημένο: Κουκκίδες και αρίθμηση

The first phase of this task will narrow down and tailor this list of criteria to a short list of unambiguously defined criteria for the specific project. These to be subsequently applied to the verification phase.

The verification process will entail applying the criteria and verifying whether or not (or, to what extent) these criteria are met. To do this, all of the following will be carried out:

- Data collection
- Trips to individual sites
- Questionnaires to responsible parties
- Interviews with responsible parties
- Assembly and classification of data from all these sources
- Analysis of data
- Description of results of analysis
- Recommendations

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Validation (verification and demonstration) takes a great part of the whole project. Therefore verification will be performed by a partner who has no commercial interest in any of the issues involved.

For this exercise the Logical Framework Matrix approach will be used.

Two main activities are to be performed in this Task

A) the activities involved and using this information to define several operational scenarios, that is, validation exercises will be examined. Further to the overall objectives, each exercise can be analysed into a set of specific objectives to be fulfilled and which may vary from one to the other because of the different circumstances.

In order to validate these objectives, the image of reality in each case should accurately be defined and the same means should be used in order to define the image of an improved situation in the future. These means are called objectively verifiable indicators, and are based on an operational description of the overall objectives, the specific objectives and the results in terms of quantity. Indicators concerning the overall objective tend to be more qualitative than those applicable to results and purpose, which have more quantitatively measurable components. The choice of indicators and their sources should be based, among other things, on the cost involved in monitoring. When indicators are excessively complex or numerous, others -indirect indicators for instance- should be sought, for which data is easier to obtain.

B) the actual validation using the Logical Framework Matrix and report of the results to the stakeholders will be performed.

IMPACT OF NEW TECHNOLOGIES ON THE EFFECTIVENESS OF DOOR-TO-DOOR INTERMODAL TRANSPORT		**Horizontal WP 3 Task 3.6**
Starting date: month **9** Duration: months ~~4~~**20**		Total Effort (MM): **13**
Partners involved	Task Leader	(MM)
CETENA		4
~~TFK~~BMT-TS	X	6
NESTEAR		3

Objectives

The objective is to evaluate the economic impact of implementing the INTEGRATION technologies in real transport chains.

Since the INTEGRATION project is demonstrating the use of technologies in Sweden and Italy, the evaluation will be made in the same two areas, the Baltic/North Sea and the Mediterranean.

Μορφοποιήθηκε

Technologies/results from other research projects

Tools and methods from other EU and commercial projects will be used.

Description

Μορφοποιήθηκε

The basis for the evaluation is knowledge about:

- Current and forecasted trade flows between different regions in Europe from Task 3.1
- Previous company owned background information on trades and trade flows
- Existing transport infrastructure and its capabilities

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Based on the forecast of future trade development, the future distribution of transport freight flows on possible new INTEGRATION-derived transport services and their competing corridors/links will be estimated.

This will be done using ~~a~~ suitable simulation tools for simulating the route and the modal choice of the transport volumes in different scenarios. With ~~this~~these tools the forecast transport volumes can be distributed to a transport network on the basis of a cost minimising function. The consequences of increased future freight transport volumes and improved transport networks on the distribution can be investigated simultaneously. With the help of the simulation tools the potential success of a newly implemented link will be compared to its existing competitors. Parameters of the links and the transfers are e.g. velocity, capacity, frequency and time and distance-dependent costs.

Simulations are carried out on the basis of the trade forecast and the physical transport network. This transport network is implemented within the system in different degrees of detail for different regions. The Baltic region is covered in significant detail. The Mediterranean region is covered on a rougher level.

The scenarios developed in Horizontal Task 3.1, as well as other information coming from the project partners, will be used as a basis for deciding the new transport services that are to be introduced into the simulation model, in what combinations and in what sequence.

The simulation system will be used to evaluate the impact of these new services, and the results will be documented in a set of reports.

~~TFK~~BMT-TS will be responsible for the Baltic/North Sea region, which will be analysed in a first phase with the preliminary results of the project, NESTEAR and CETENA for the Mediterranean, which will be analysed in a second phase along with the Baltic/North Sea second iteration when .the final results from demo sites and simulations will be available.

MONITORING, ASSESSMENT, EVALUATION, IMPLEMENTATION		**Horizontal WP 3 Task 3.7**
Starting date: month nr. ~~5~~**10**	Duration: months ~~32~~**26**	Total Effort (MM): **5**
Partners involved	Task Leader	(MM):
CETENA	X	2
NESTEAR		3

Objectives

Monitoring the technical advancement of the project versus the project objectives.

Assessment of the work in progress and evaluation of results.

Implementation has two goals:

- implementation of new services based on new technologies: this would require some time to get shippers used to these techniques
- secondly the economic return for the industrialists: how many ships or transhipment equipment can be sold.

Description

The project monitoring activity is performed every six months at the Project Technical Meetings.

Assessment and evaluation of results is performed taking also into account the contribution of the Advisory Group, in order to evaluate at the project Steering Committee level any improvement possible within the budget. If applicable, the method of Horizontal Task 3.5 will be used for the evaluation of the results of the tasks, with the set of criteria established in Horizontal Task 3.5. If not applicable, other conventional evaluation/validation-methods will be used.

The activities in the Task require a feed back to the global market in order to assess the potential for the new market identified during the project and from the global market to identify the market potential of technologies and systems, the rhythm of implementation of the new technologies, and the actions required to cover the first years 'deficit'. This will require also some considerations about environmental aspects, with in particular the possible transfer from road.

Μορφοποιήθηκε

Μορφοποιημένο: Κουκκίδες και αρίθμηση

EXPLOITATION & DISSEMINATION		Horizontal WP 3 Task 3.8
Starting date: month nr. **11** Duration: months **25**		Total Effort (MM): ~~21.4~~**22.4**
Partners involved	Task Leader	MM
CETENA	x	~~5~~4.5
IZAR		1
FINCANTIERI		1
TTS		0.5
BMT		1
LOGIT		0.7
MCT		0.9
DFDS		1
GRANFERRY		1
~~NDC~~DANAHER MOTION		1
SSPA		0.6
STRATHCLYDE U.		1
CTO		~~0.5~~1
PORT OF LIVORNO		0.4
SIR		1
NTUA		3.8
SSS		1
PORT OF GOTHENBURG		1

Objectives

Μορφοποιήθηκε

To disseminate the project results as well as to generate the exploitation ~~plan~~ of INTEGRATION.

Description

Μορφοποιήθηκε

The first steps to assess the project's visibility will be the creation of a public web site.
The web site will be updated during the development of the project, in order to present an up to date status.

Further visibility of the project will be achieved by printing a leaflet to be distributed to interested contacts during exhibitions or ad hoc meetings. The project will be presented during different European exhibitions.

The press will also be taken into account from the very beginning.
A list of suitable general newspapers as well as magazines from the specific field will be created for press conferences and press releases.

The exploitation plan of INTEGRATION should first and foremost be considered as a useful and essential final activity for the project. Since INTEGRATION is not a research project developing a specific product, but instead a platform integrating various innovative technologies, the interaction with the external world throughout the project lifecycle will continuously be updated and modify the input to the project changing accordingly the validation scenarios.

Therefore, initially, the exploitation potential of the INTEGRATION results will be analysed by reviewing the opinion of Industry and of the Industrial Advisory Group. Additionally, using various virtual scenarios, the final adaptation to the real industrial interests and needs will be also performed.

Subsequently, convincing information should be prepared in order to promote the idea and wide spread application of the technology platform. The nature of INTEGRATION is such that it is obviously essential to be adopted in a large scale if it is to have the envisioned results. It is worth reminding, that the project concerns essentially a redesign of the modus of transportation in Europe. The importance of this task is obvious since for the realisation of such a platform, wide scale infrastructure changes should be performed and hence big scale funding is necessary. Thus a convincing case for potential public and/or private funding should be set out for the exploitation of the new technology platform that will be generated. To this end, demonstrations in real sites as well as using the simulation software are envisaged.

Summarising the above, the specific tasks for the construction of the exploitation plan are the following:

1. Finalising the platform design through expert opinion and strategic/political considerations;
2. On site demonstration, promotion, and dissemination of individual results (for every scenario);
3. Demonstration of the entire platform for all scenarios, via simulation;
4. Construction of a convincing case for potential financing from public and private sources.

Μορφοποιημένο: Κουκκίδες και αρίθμηση

Διαγράφηκε: Αλλαγή σελίδας