



Dismantling of Vessels with Enhanced Safety and Technology

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**SSA – FP7 Maritime Transport - Brokerage Event
01 September 2010, London**

DIVEST – Overview



Dismantling Vessels With Enhanced
Safety and Technology

A satellite-style map of Europe and the Mediterranean region. Overlaid on the map are various statistics and flags. The text is in red and black. A compass rose is in the bottom left corner. Small copyright notices for Europa Technologies, TerraMetrics, and NASA are at the bottom center. The Google logo is in the bottom right corner.

36 Months:
01/08/2008 to 31/07/2011
€2.5m funding
11 Partners
8 Countries

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Dismantling Vessels with Enhanced Safety and Technology

An holistic understanding of ship dismantling: Project Overview

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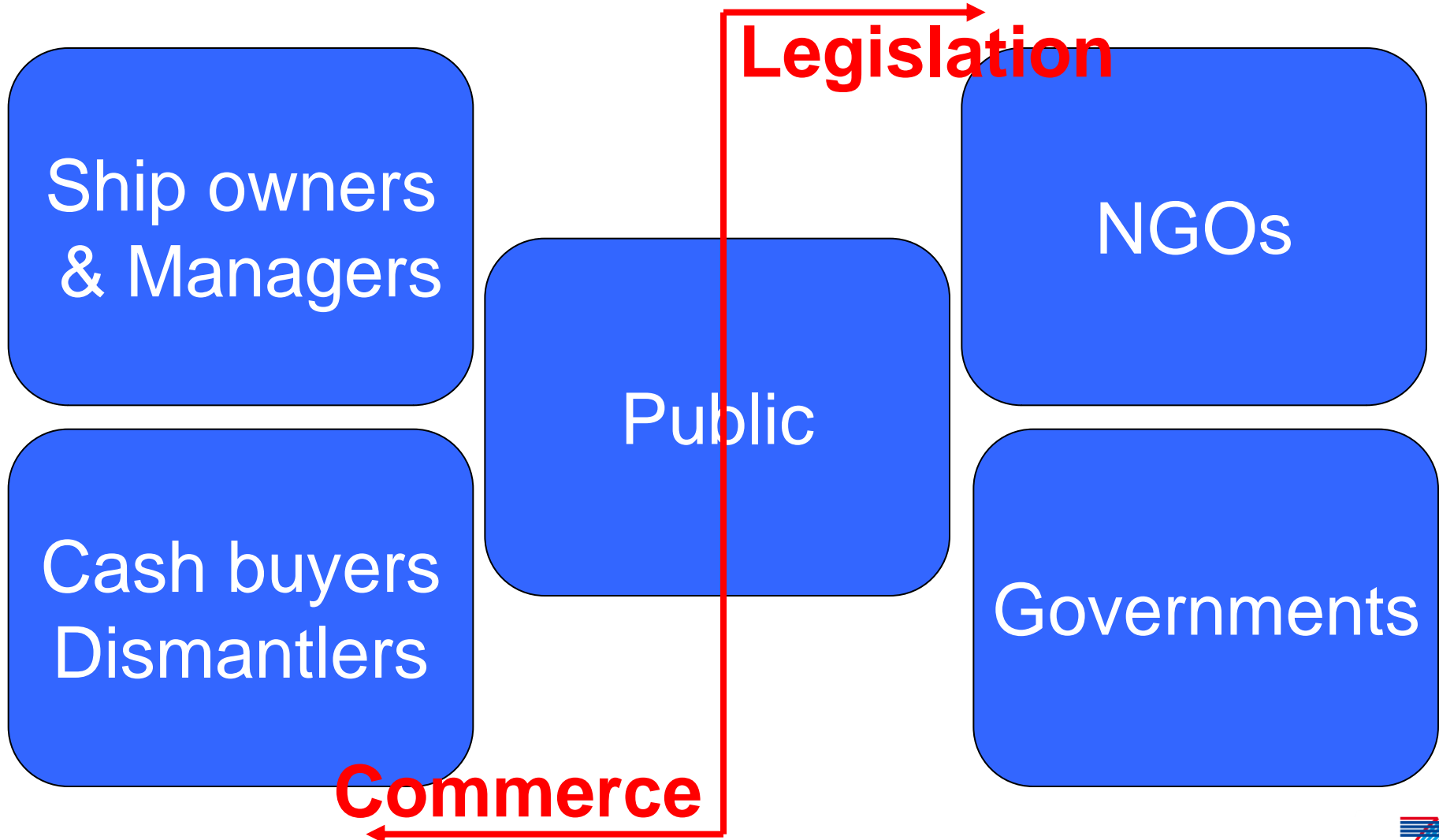
- Project objective
- Project approach
- Value maps
- Output & Impact
- Lessons learnt

Objective of DIVEST

To provide an integrated risk and economic framework applicable to the optimization of ship dismantling activities and infrastructure

Decision support **NOT** Decision Making

Stakeholder Community



Stakeholders & Key Drivers

Ship owners & Managers	Corporate Stewardship	Cost
Cash buyers Dismantlers	Opportunity	Value
Public	Environment	Health and Safety
NGOs	Environment	Sustainability
Governments	Policy	Future Legislation

A Complex Legal Framework

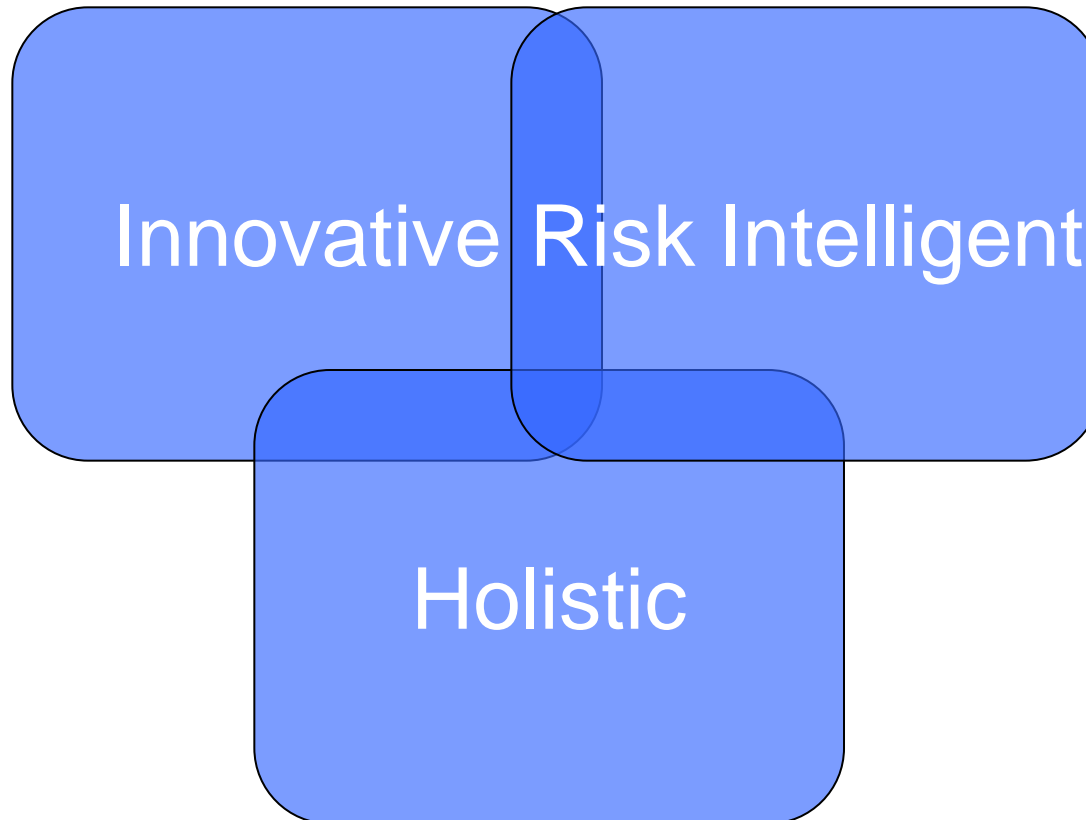
International Law
(conventions)

Local Laws
(Cities, districts)

Regional Laws
(EU, Asia, Americas)

National Laws (Sovereign State)

The DIVEST Approach



Innovative

- looking at ‘value’ arguments:
 - qualitative and quantitative
- Benchmarking:
 - across a broad range of industries with similar issues

Holistic

The analysis combines:

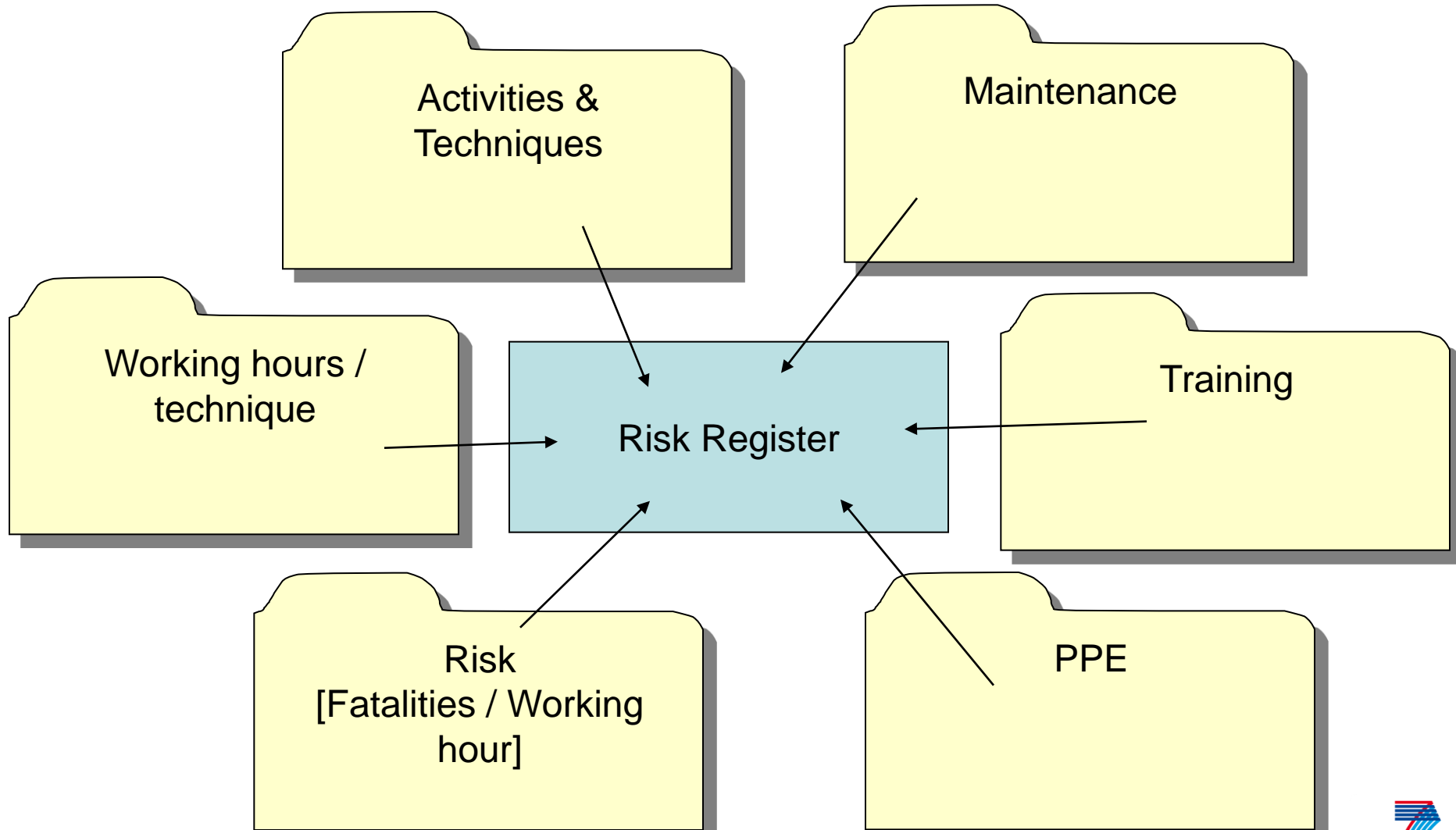
- Social,
- Legal,
- Technical,
- Environmental,
- Economic,

drivers and constraints

Risk Intelligent

The most appropriate, validated, risk and economic tools and models are applied to each individual steps of dismantling chain.

Risk Intelligent

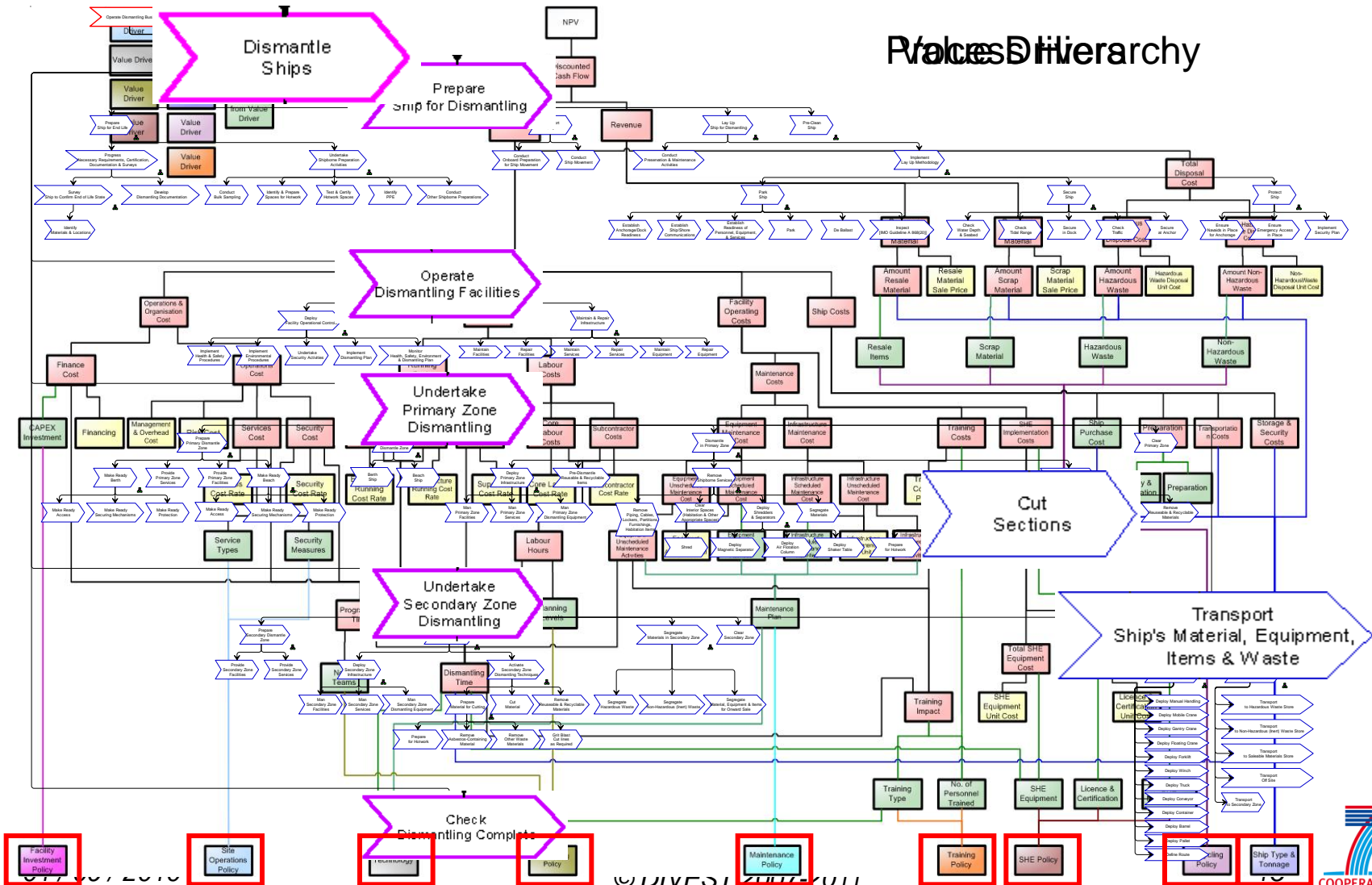


The DIVEST Integrated Model

- Dismantling as:
 - Manage Dismantling
 - Dismantling Ships
- Mapping Economic Value through the ship dismantling business
- Evaluating economic value from costs and revenues

Value Based Modelling

Value Hierarchy



Value Model Operation

18 % ACTIVITY TIME CALCULATION-----

19

FP7-SST-2007-RTD1

FP7-SST-2007-RTD1 Ship Dismantling Scenario - Workshop DIVEST

IN CONFIDENCE

5.3 Cutting on board (Deck)

In this study, cutting on board means cutting of ship's structure in an L shape panel section (side/deck) using oxy-acetylene cutting. There were three workers on board ship and each had an assistant to help the cutting process and also to minimize careless accidents. There was also a foreman managing the work being done on board.

Cutting on board for the L shaped panel, is performed by two workers. (One ship cutter and his assistance)

In Figure 5.2 a worker is cutting on the L shaped block from the ship and his assistant is also just behind him holding the hose of cutting torch to prevent from trips.

Figure 5.2: Cutting on board

Performance Table	
Task definition	Cutting
Number of workers	2
Worker details	1 Ship-cutter, 1 assistant
Equipment/resource used	Oxy-acetylene cutting torch
Time consumed (net operation time)	22 min
Place	On-board

Table 5.2

IN CONFIDENCE Page 7

```

64                                     % FACILITY INVESTMENT COST CALCULATION-----
65 - SMC      = 1;                                     %Supervisor Labour Manning Levels
66                                     % (men per ship area, total number of
67                                     % supervisors)
68 - Mts      = 2;                                     %Subcontractor Labour Manning Levels
69                                     % (men per team, total number of
70                                     % subcontractors)
71
72 % FACILITY INVESTMENT COST CALCULATION-----
73
74 FValue     = 0;                                     %Purchase/replacement cost of equipment
75                                     % in Euros of ship's weight, where the
76                                     % equipment's lifespan is greater than 1
77                                     % year
78 - ERate     = 3;                                     %Annual discount rate. Note this can never
79                                     % be greater than 100%
80 - EPeriod   = 1;                                     %Discount period (years)
81 - EPurchase = 0;                                     %One off purchase cost of the equipment (euros)
82                                     %which did not require any form of
83                                     %financial lending
84 - ERenew    = 1;                                     %Equipment renewal period for one off
85                                     %purchased items.
86
87 %INFRASTRUCTURE FINANCING
88 - IValue    = 10 0 0 0 0;                          %Purchase/replacement cost of
89                                     %Infrastructure in euros's or similar
90                                     %metric, where the Infrastructure's
91                                     %lifespan is greater than 1 year
92 - IRate     = [3 3 3 3 3];                          %Annual discount rate. Note this can never
93                                     %be of value 0%
94 - IPeriod   = [1 1 1 1 1];                          %Discount period (years)
95 - IPurchase = [0 0 0 0 0];                          %One off purchase cost of the
96                                     %Infrastructure which did not require any
97                                     %form of financial lending
98 - IRenew    = [1 1 1 1 1];                          %Infrastructure renewal period for one off
99                                     %purchased items.
100
101 % SITE OPERATION COSTS CALCULATION-----
102 - Management_OH = 0;                                %Management and overhead costs for site
103                                     %operations per annum.
104 - Risk_Costs   = 0;                                %Risk costs per annum for site.
105 - Services_Costs = 0;                              %Services Costs per annum for site.
106 - Security_Costs = 0;                              %Security Costs per annum for site.
107
108
109 % TECHNOLOGY COSTS CALCULATION-----
110

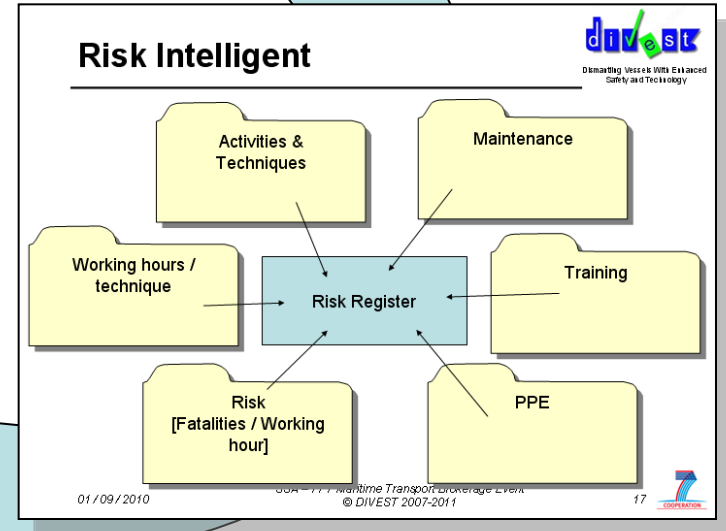
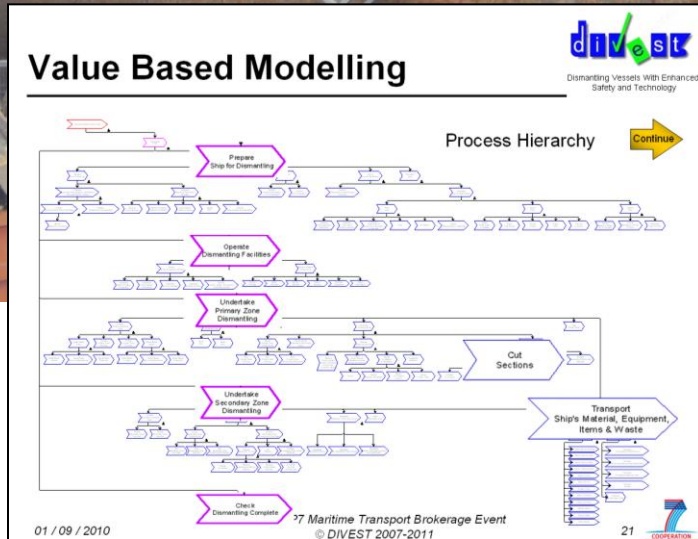
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Data collected via field study or direct from dismantlers used as input to Value Model Example – Cutting Steel in the Primary Zone

Collaboration with Industry



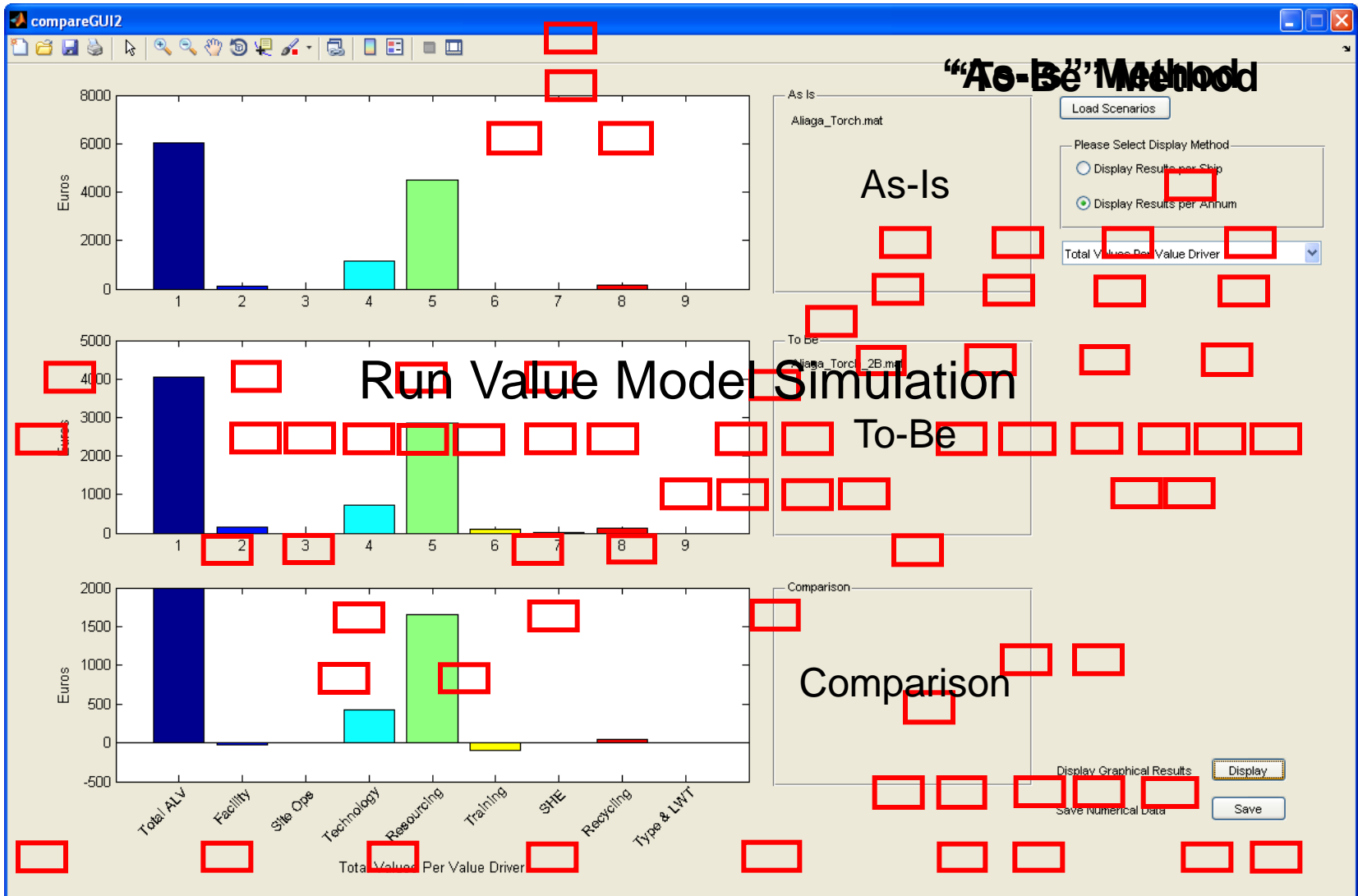
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Value Model Operation



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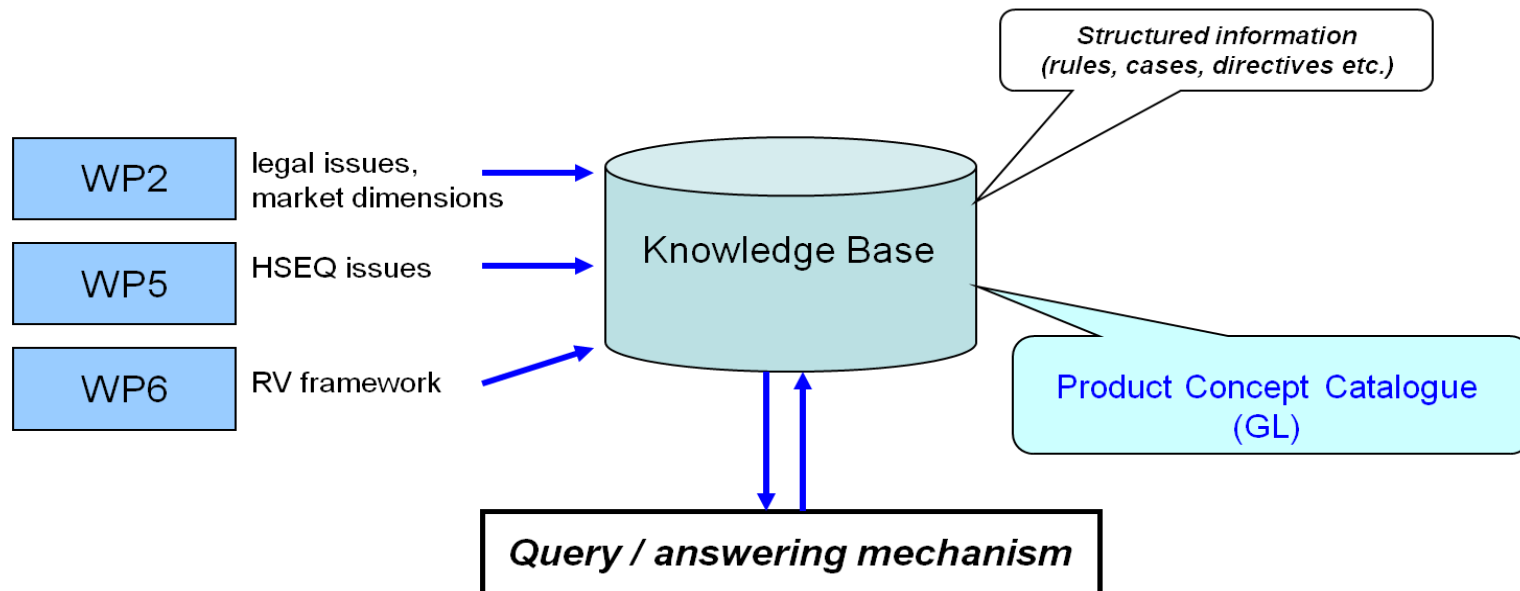


Output

Policy recommendations
+
Validated risk and economic models
+
Information exchange
=
Decision support tool
(knowledge base)

Bridging the Gap

Data → Information → Knowledge



Important issues:

- (i) definition of appropriate data format
- (ii) definition of appropriate semantics (keywords, metadata, ontologies)

Impact of the Project

Direct and measurable impact on the stakeholder community

- A suite of tailored training programs to be tested and validated in-situ (India for example),
- Active dissemination from day 1 and until the very end of the Project.

The impact of DIVEST is amplified by the EU program environment

- Access to broad network of pertinent research organisations, universities and commercial entities,
- Prestigious funding framework enhancing credibility of individual actors and fostering further dissemination and networking,
- Interest from broader stakeholder community (World Bank, Governments etc.)

Lessons Learnt – *critical “must-do” items*

- Set realistic and on-field objectives
- Clearly define the problem – *use business cases*
- Understand “user requirements” at start of the project + continue to develop throughout the project
- Encourage closer co-operation between the partners in key WPs
- Minimize the risks where identified
- Involve more end-users and organizations



Objective decision making support
to
the stakeholder community

www.divest-project.eu