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The European Commission's in-house science service

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CISE data model design

Serving society
Stimulating innovation
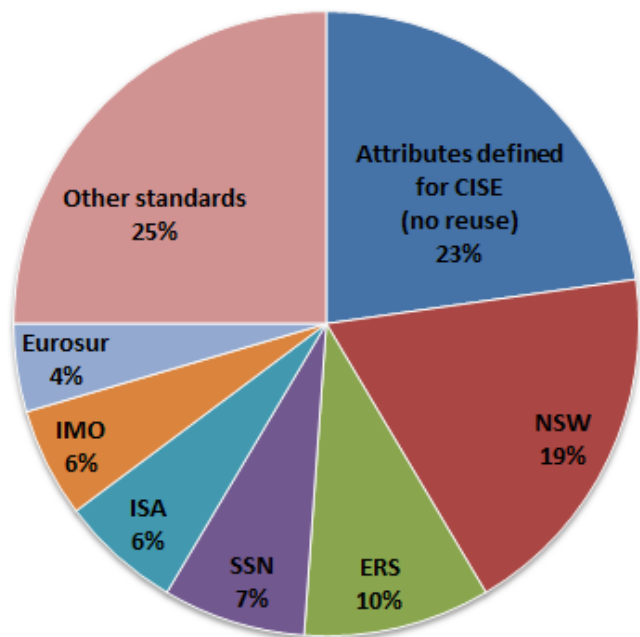*Supporting legislation*

CISE data model

- Data models are defined in terms of
  - Entities (object existing in the business domain)
  - Attributes (its properties)
  - Relationships among entities
  - Constraints (business rules)

- CISE data model objective: to reach **semantic interoperability** between maritime surveillance systems
  - to enable systems to combine received information with other information resources and to process it in a meaningful manner (European Interoperability Framework)

CISE data model design

- Sector-neutral model
  - Avoids specificities from sectorial business processes

- Defines entities and attributes relevant for cross-sector information exchanges

- Reuses whenever possible definitions of entities/attributes used in existing systems
  - CISE data model = union of subsets of elements of some sectorial models packaged in a sector-neutral structure

CISE data model design

Reuse of existing standards

Pie chart:
- Attributes defined for CISE (no reuse) 23%
- NSW 19%
- ERS 10%
- SSN 7%
- ISA 6%
- IMO 6%
- Eurosur 4%
- Other standards 25%

- Examples of reused standards and existing systems: National Single Window (port formalities), Eurosur, SafeSeaNet, ERS, IMO (FAL, GISIS, ISPS, IMDG), UNECE recommendations 20 and 21, IVEF, OASIS CAP, ISO standards (28005, 8601, 3166-1, 15836…), ISA Core Vocabularies, TSO, W3C Ontology, ANSI (NISOZ3985), IETF, …

- Advantage: ensure a certain level of compatibility

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Interoperability between existing systems

- Purpose: evaluate the translation possibilities between CISE data model and some existing data models

- For each existing data model, a mapping at attribute level distinguishes
  - The attributes reused directly and doesn't need a conversion
  - The attributes not selected to be part of the CISE data model
  - The attributes represented with a different structure in the CISE data model, either because the structure of another data model was chosen or the existing structure has been improved

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Interoperability between existing systems

- ISO 28005 : Electronic port clearance standard

ISO28005
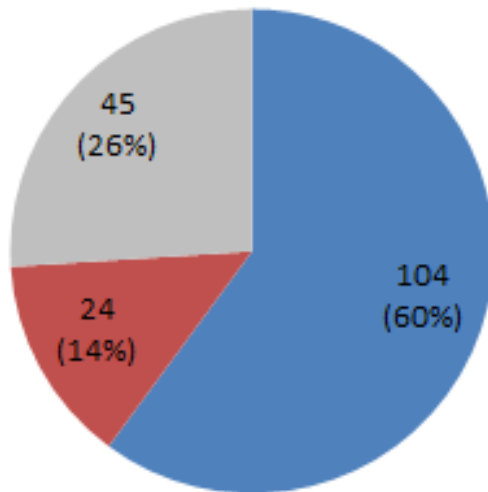
- attributes reused
- attributes reused with a different semantic
- attributes not selected

45 (26%)
104 (60%)
24 (14%)

Examples

ISO/CISE	
CargoType : possible types of cargo (enumeration from UNECE-RECOM21)	

ISO	CISE
Agent (name, address, contact)	Agent (vCard format, IETF RFC6350)

ISO
AirDraught (Distance from waterline to highest point of vessel under the current loading conditions)

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Interoperability between existing systems

- National Single Window to SafeSeaNet model
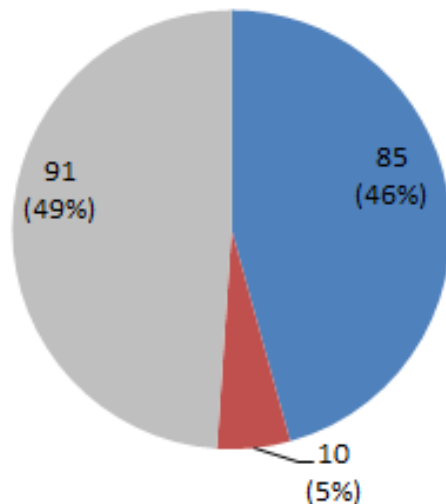
Examples

NSW in SSN

- attributes reused
- attributes reused with a different semantic
- attributes not selected

NSW-SSN/CISE	
PollutionCode (Marpol, annex II)	

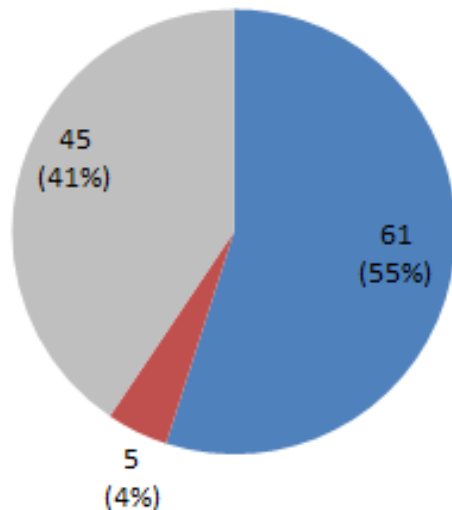| NSW-SSN	CISE
VesselType (UNECE R28)	VesselType (IMO list)

NSW-SSN	
Port of delivery of remaining Waste	

Interoperability between existing systems

- Eurosur event data model

Eurosur

- attributes reused
- attributes reused with a different semantic
- attributes not selected

45 (41%)
61 (55%)
5 (4%)

Examples

Eurosur/CISE	
EventType	

Eurosur	CISE
Location Name (gazetteer)	Location Name (free text)

Eurosur	
Smuggled Object Value	

Next steps

- The data model is tested during the CISE Demonstrator

- The data model will be put into practice during the PoV

- The Commission will provide technical support to implement translation mechanisms between the data models available in existing systems and the CISE data model

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Next steps

- CISE data model will be further enriched with new data entities and attributes
  - The evolution should be driven by information need of final users

- An appropriate administrative structure for the management and maintenance of the data model needs to be defined

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