

# The SeaLiT Ontology

An extension of CIDOC-CRM for the modelling of Maritime History information

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Research  
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# Outline

- Context
- The SeaLiT Ontology
- Application
- Conclusion and Next Steps

# Context

# Context

- The project '**SeaLiT**' - <http://www.sealitproject.eu/>
  - **Full title:** Seafaring Lives in Transition. Mediterranean Maritime Labour and Shipping during Globalization, 1850s-1920s
  - **Project type:** ERC starting grant (Feb 2017–Jan 2023, Grant agreement ID: 714437)
  - **Field:** Maritime History
  - **Principal Investigator:** Dr. Apostolos Delis, Centre for Maritime History, Institute of Mediterranean Studies – FORTH
  - **Research Groups:**
    - ❖ Centre for Maritime History / Institute of Mediterranean Studies – FORTH (**Greece**)
    - ❖ T.I.G. / University of Barcelona (**Spain**)
    - ❖ NAVLAB / University of Genoa (**Italy**)
    - ❖ UMR TELEMME / University Aix-Marseille (**France**)
    - ❖ Department of History / University of Zadar (**Croatia**)
    - ❖ **Centre for Cultural Informatics / Institute of Computer Science – FORTH (Greece)**



Seafaring Lives in Transition

# SeaLiT – The research focus

- ❑ The transition from sail to steam navigation and its effects on seafaring populations in the Mediterranean and the Black Sea between 1850s-1920s
- ❑ The maritime labour market, the life on board and ashore, the evolving relations among ship owners, captains, crew and local societies
- ❑ Maritime regions of investigation:
  - Barcelona and the Spanish Levant coasts
  - Marseille and the Provençal ports
  - Genoa and the Ligurian littoral communities
  - Trieste and the Dalmatian coasts
  - Ionian and Aegean islands
  - Odessa and the Crimean ports



# SeaLit – The archival sources

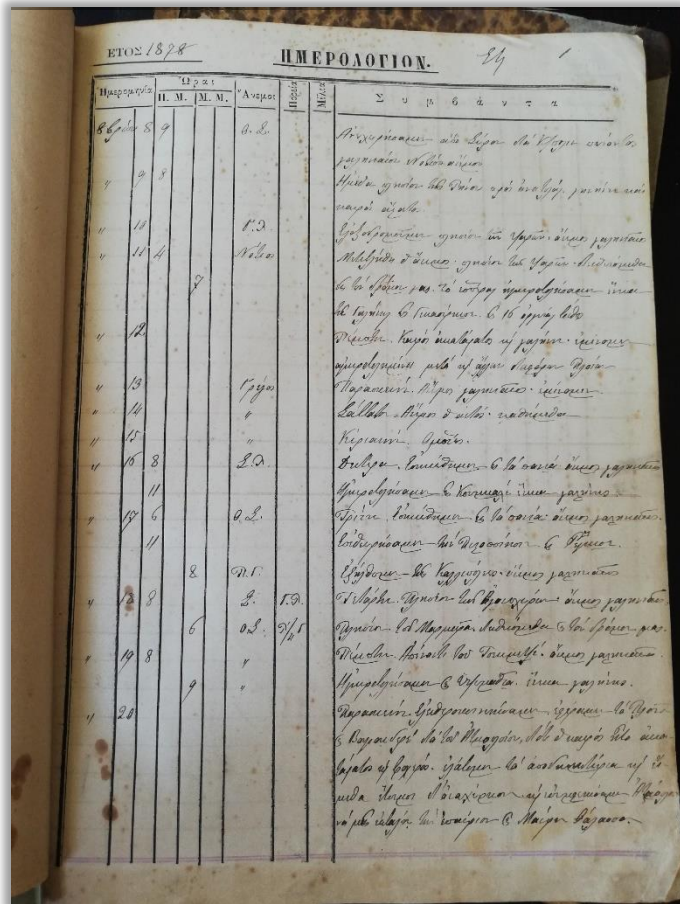
- ❑ Crew lists
- ❑ Ship logbooks
- ❑ Account books
- ❑ Censuses
- ❑ Sailors registers
- ❑ Students registers
- ❑ Civil registers
- ❑ Maritime personnel registers
- ❑ Payrolls
- ❑ Employment records

- *Handwritten!*
- *In different languages!*
- *From different issuing authorities!*

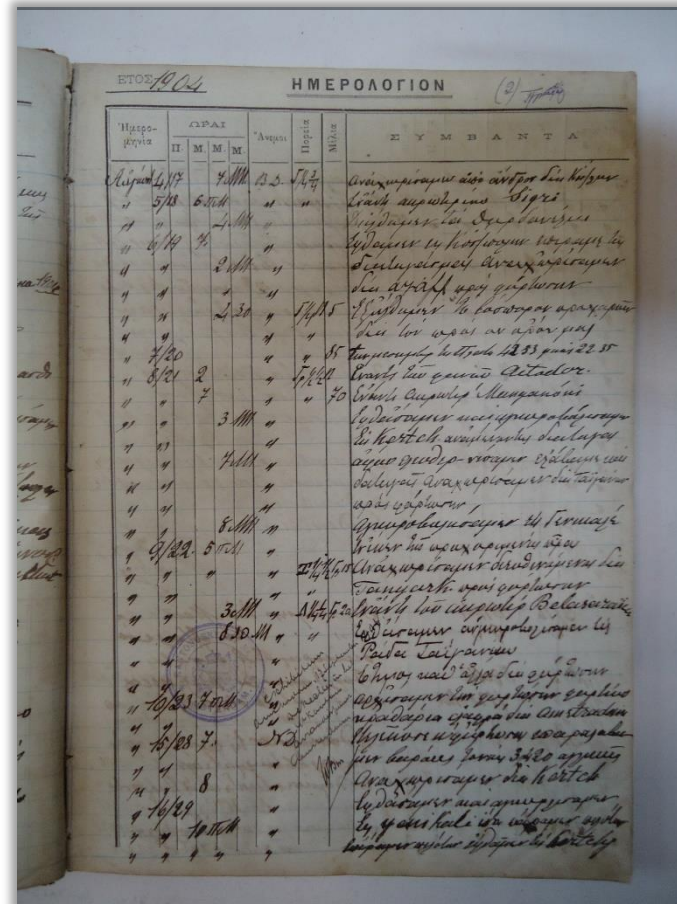


Rol de Navegación Corbeta Catalina.  
Archivo General de Marina. Viso del Marques, Leg. 7167-2

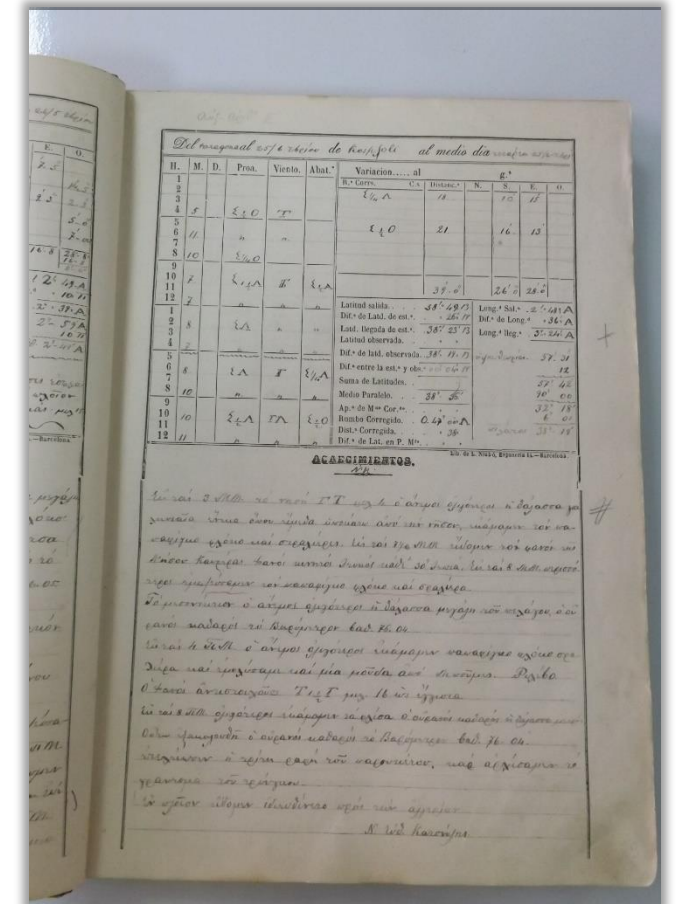
# SeaLiT – Examples of ship logbooks



**Brig Eleni Koupa**  
(Private Archive of Evangelos Rafalias, Hydra)

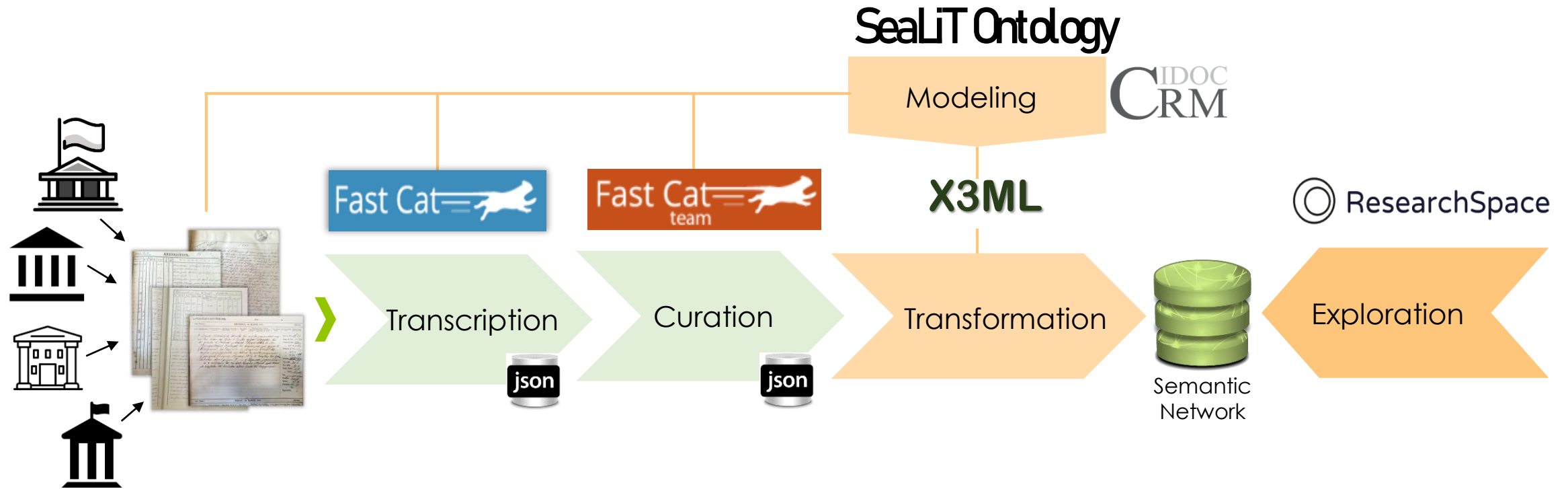


**Cargo steamer Leonidas**  
(Syrmis Archive, Hellenic Literary and Historical Archive [ELIA], Athens)



**Barquentine Asimoula**  
(Maritime Museum of Galaxidi)

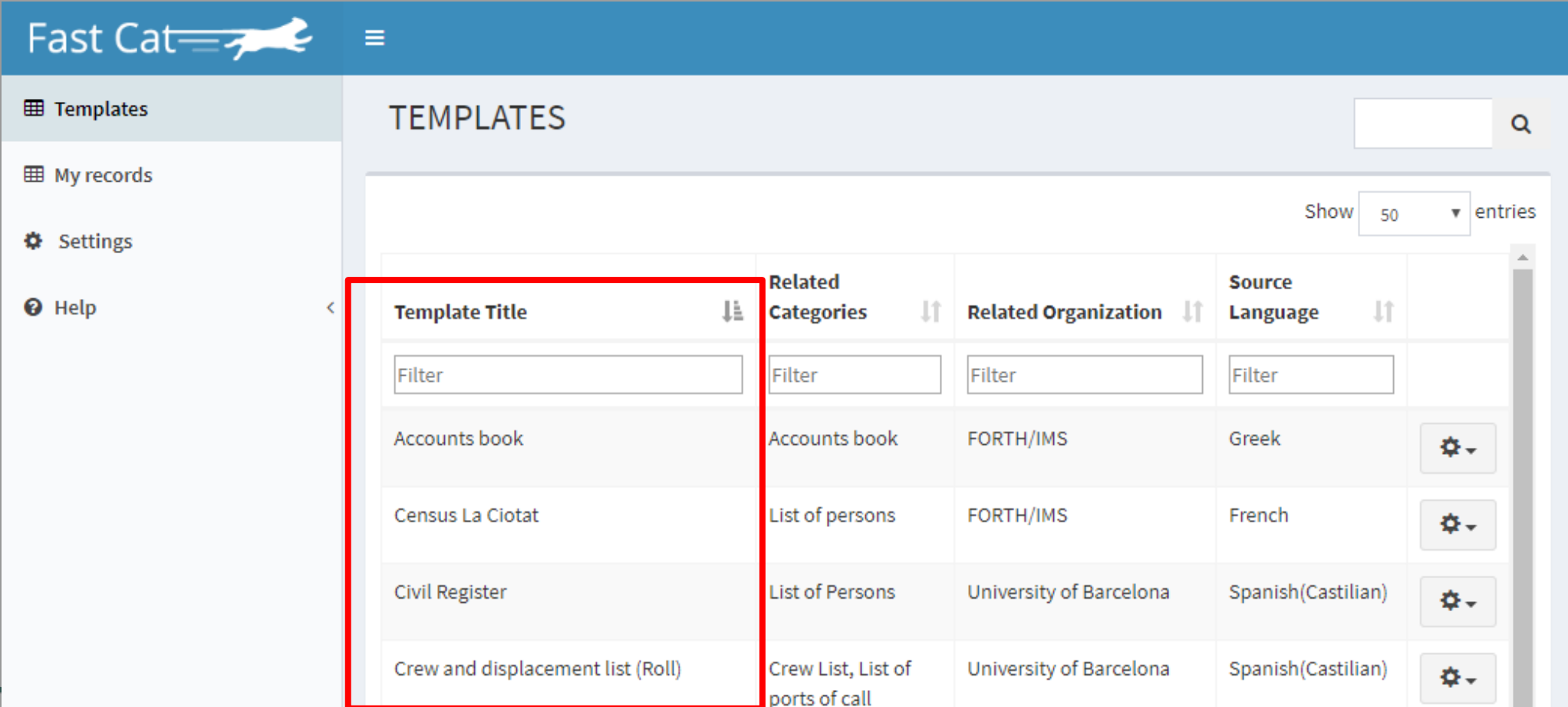
# The data management workflow





# Data transcription with FAST CAT

- Data from different sources are transcribed as '**records**' belonging to '**templates**'
  - A '**template**' represents the structure of a single data source



The screenshot shows the FAST CAT web application interface. The top navigation bar includes the 'Fast Cat' logo and a search icon. The left sidebar contains navigation options: 'Templates', 'My records', 'Settings', and 'Help'. The main content area is titled 'TEMPLATES' and features a search bar and a 'Show 50 entries' dropdown. Below this is a table with the following columns: 'Template Title', 'Related Categories', 'Related Organization', and 'Source Language'. The first four rows of the table are highlighted with a red border:

Template Title	Related Categories	Related Organization	Source Language
Filter	Filter	Filter	Filter
Accounts book	Accounts book	FORTH/IMS	Greek
Census La Ciotat	List of persons	FORTH/IMS	French
Civil Register	List of Persons	University of Barcelona	Spanish(Castilian)

# Data transcription with FAST CAT

- Data from different sources are transcribed as **'records'** belonging to **'templates'**
  - A **'record'** organizes the data and metadata in tabular form (tables)

The screenshot displays the FAST CAT interface for a specific record. The record title is "Crew List (Ruoli di Equipaggio), Nostra Signora di Montenero, 1853-08-31, Massimo Ponasso".

**FastCat Record Information**

Use english to fill in the fields of this table

Id	Date		Authors		
	Creation date	Last Modified	Name *	Surname *	Role
16	2018-12-18	2019-09-05T14:39:47	Massimo	Ponasso	

**Source Identity**

Use the source language to fill in the fields of this table

Archive / Library			
Name	Location	Register Number	Number
Archivio di Stato di Genova	Genova	13	4147

**Ship Identity**

Use the source language to fill in the fields of this table

Ship Identity			
Ship name *	Ship type	Tonnage	Location
Nostra Signora di Montenero	Bombarda	88,76	Varazze

**Crew List**

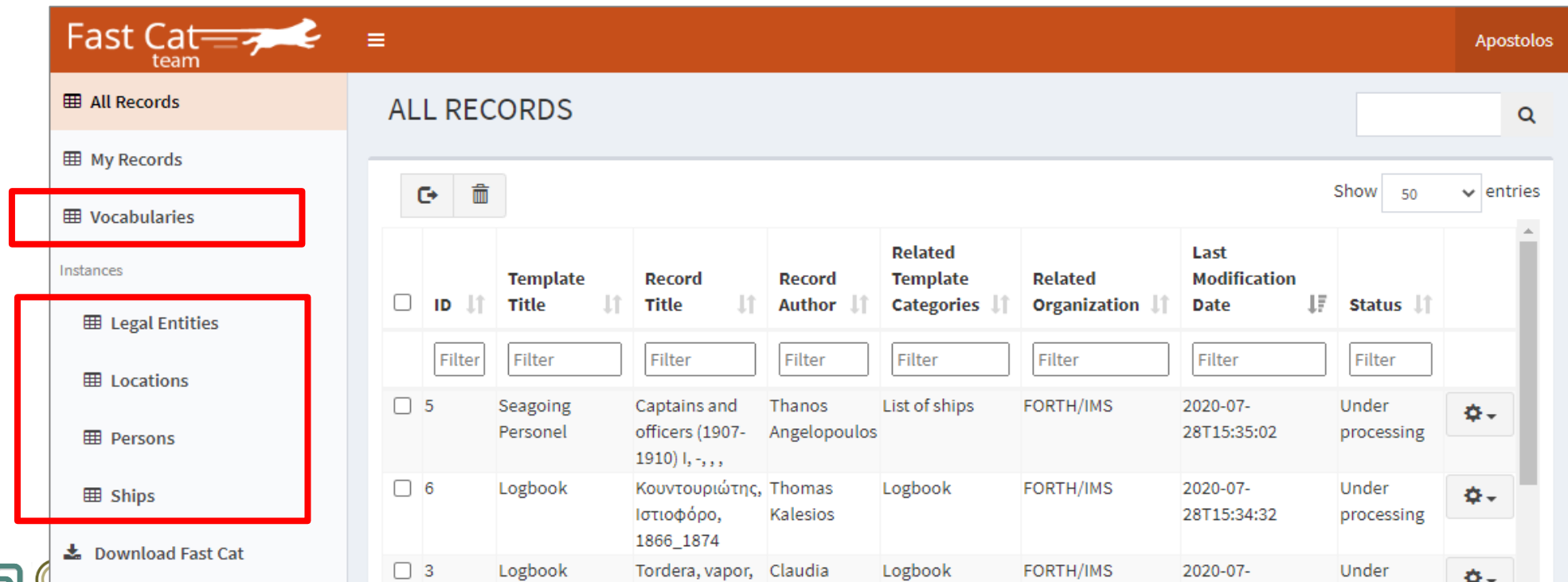
Use the source language to fill in the fields of this table

	Embarkation		Discharge		Surname	Name	Citizenship	Location of Residence	Date of Birth
	Port	Date	Port	Date					
2	Genova	1853-07-06	Genova	1854-01-20	Castagniola	Fortunato		Camogli	1811
3	Genova	1853-07-06	Genova	1854-01-20	Schiaffino	Fortunato		Camogli	1807
4	Genova	1853-07-06	Genova	1853-10-14	Figari	Fortunato		Camogli	1811
5	Genova	1853-07-06	Genova	1853-10-14	Cimidlia	Antonio		Sanremo	1833

# Data curation with FAST CAT TEAM

## □ FAST CAT TEAM:

- Management of **entity instances** and **vocabulary terms** (that appear in the transcripts)
- It decouples data curation from data transcription
  - ❖ We avoid 'spoiling' the original transcripts (important for verification and long-term validity)



The screenshot displays the Fast Cat team web application interface. The top navigation bar includes the logo, a hamburger menu, and the user name 'Apostolos'. The left sidebar contains navigation options: 'All Records', 'My Records', 'Vocabularies', and 'Instances'. Under 'Instances', there are sub-options for 'Legal Entities', 'Locations', 'Persons', and 'Ships'. The main content area is titled 'ALL RECORDS' and features a search bar, a 'Show 50 entries' dropdown, and a table of records. The table has columns for ID, Template Title, Record Title, Record Author, Related Template Categories, Related Organization, Last Modification Date, and Status. Three records are visible, each with a checkbox, a filter button, and a settings icon.

ID	Template Title	Record Title	Record Author	Related Template Categories	Related Organization	Last Modification Date	Status
5	Seagoing Personnel	Captains and officers (1907-1910) I, -, , ,	Thanos Angelopoulos	List of ships	FORTH/IMS	2020-07-28T15:35:02	Under processing
6	Logbook	Κουντουριώτης, Ιστιοφόρο, 1866_1874	Thomas Kalesios	Logbook	FORTH/IMS	2020-07-28T15:34:32	Under processing
3	Logbook	Tordera, vapor,	Claudia	Logbook	FORTH/IMS	2020-07-	Under

# Some stats...

- 30 users in 5 countries
- **20 templates**
- >600 records
- 5 languages

## FAST CAT TEAM:

- ~50 vocabularies
- ~100K person instances
- ~10K location instances
- >2.5K ship instances
- ~1K legal entity instances

No	Template Name	# Records
1	Accounts book	14
2	Census La Ciotat	63
3	Civil Register	29
4	Crew and displacement list (Roll)	35
5	Crew List (Ruoli di Equipaggio)	98
6	Employment records, Shipyards of Messageries Maritimes, La Ciotat	50
7	First national all-Russian census of the Russian Empire	6
8	General Spanish Crew List	64
9	Maritime Register of the State for La Ciotat	1
10	List of ships	71
11	Logbook	17
12	Naval Ship Register List	2
13	Notarial Deeds	10
14	Payroll	7
15	Payroll of Russian Steam Navigation and Trading Company	14
16	Register of Maritime personel	4
17	Register of Maritime workers (Matricole della gente di mare)	6
18	Sailors register (Libro de registro de marineros)	52
19	Seagoing Personel	52
20	Students Register	10

# Ontology-based data integration

- ❑ Creation of schema mappings (one per FAST CAT template)
  - that map the elements of a template (source schema) to elements of the **SeaLiT Ontology** (target schema)

## ❑ X3ML Toolkit

- X3ML mapping definition language
- 3M Editor (user interface)
- X3ML Engine (transformation)

3M Mapping : Crew\_list\_Ruoli\_di\_Equipaggio

Info Matching Table Generators Analysis Configuration About

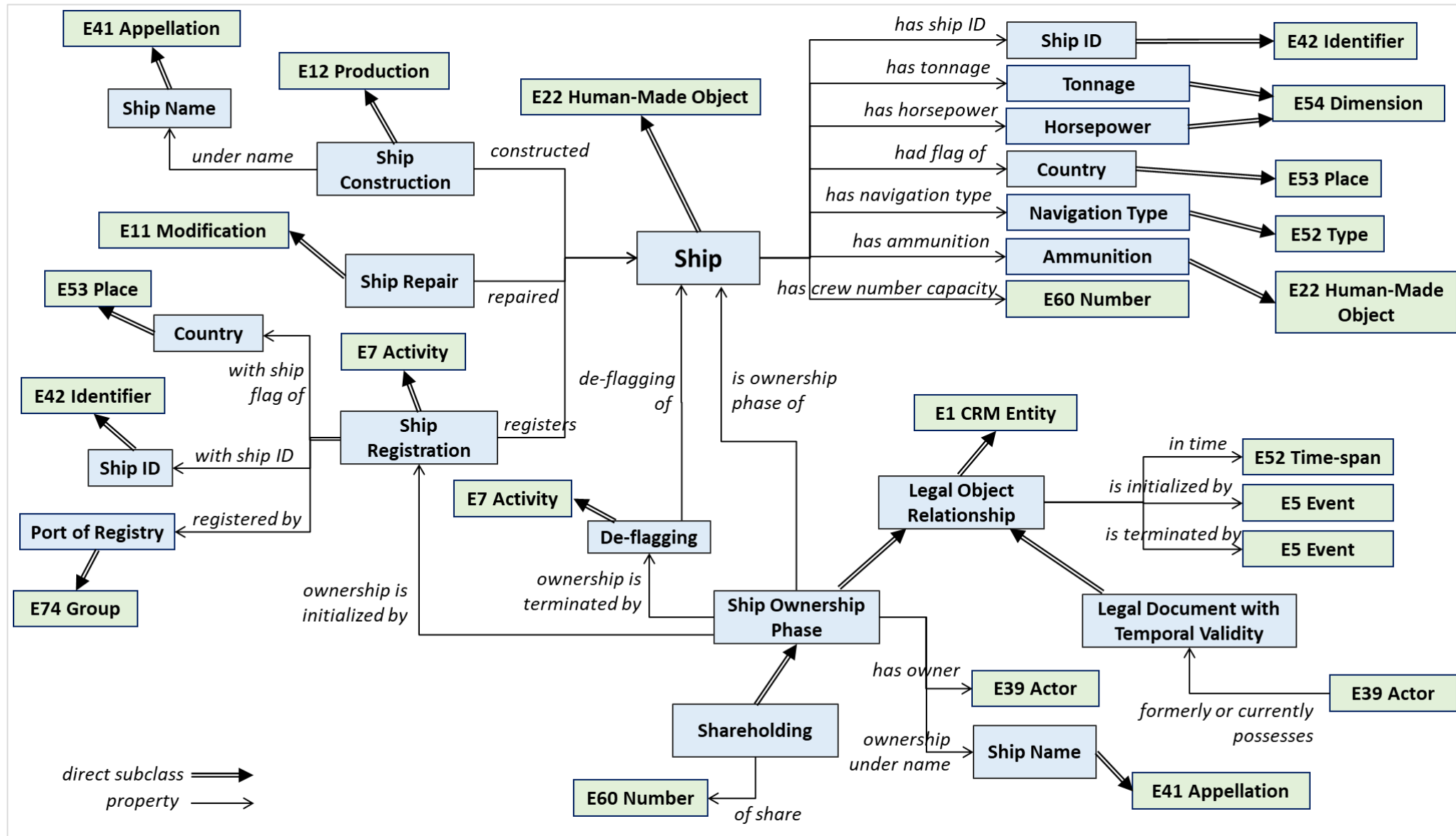
#	SOURCE	TARGET PATH NAME	TARGET	CONSTANT EXPRESSION	IF RULE
1	D <input type="checkbox"/> ./root		<input type="checkbox"/> Ship		exists(../text()/text()) AND exists(../text()/text())
1.1	P <input type="checkbox"/> ↓ ./ship_name		↓ was_constructed_by <input type="checkbox"/> Ship_Construction <input type="checkbox"/> [c]		
	R <input type="checkbox"/> ./ship_name		↓ under_name <input type="checkbox"/> Ship_Name		
1.2	P <input type="checkbox"/> ↓ ./ship_name		↓ P1_is_identified_by <input type="checkbox"/> Ship_Name		
1.3	P <input type="checkbox"/> ↓ ./ship_type		↓ P2_has_type <input type="checkbox"/> E55_Type		
1.4	P <input type="checkbox"/> ↓ ./ship_tonnage		↓ has_tonnage <input type="checkbox"/> Tonnage ↓ P90_has_value <input type="checkbox"/> rdf-schema#Literal		exists(text())
1.5	P <input type="checkbox"/> ↓ ./construction_location		↓ was_constructed_by <input type="checkbox"/> Ship_Construction <input type="checkbox"/> [c]		
	R <input type="checkbox"/> ./construction_location		↓ P7_took_place_at <input type="checkbox"/> E53_Place		
1.6	P <input type="checkbox"/> ↓ ./construction_location_date		↓ was_constructed_by <input type="checkbox"/> Ship_Construction <input type="checkbox"/> [c] ↓ P4_has_time-span <input type="checkbox"/> E52_Time-Span ↓ P82_at_some_time_within		

# The SeaLiT Ontology

# The SeaLiT Ontology

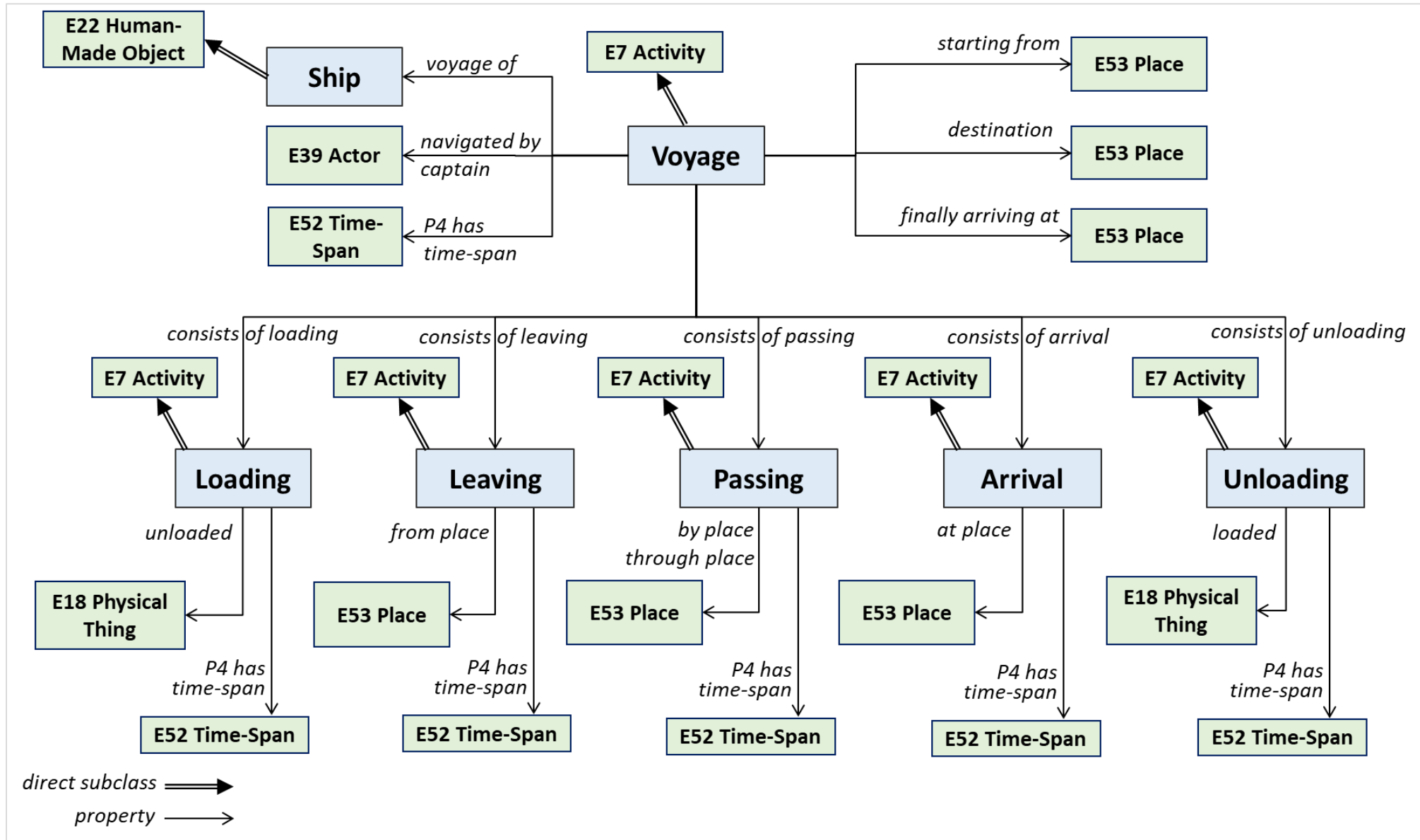
- An extension of CIDOC-CRM for the modelling of **Maritime History** information
  - It allows describing activities and information related to:
    - ❖ **Ships** and **ship voyages**
    - ❖ **Employments** and **payments**
    - ❖ **Seafaring people**
    - ❖ **Teaching activities**
  - It currently contains **46 classes** and **79 properties**
  - It was built **gradually** (*source by source*) by analyzing data in the records of each FAST CAT template, as well as by studying **competency questions** provided by the historians of SeaLiT
- Its **definition** and **RDFS** implementation are available through Zenodo (under a creative commons license)
  - <https://doi.org/10.5281/zenodo.5964240>**
- **Namespace** (resolvable): **<http://www.sealitproject.eu/ontology/>**

# The SeaLiT Ontology – Modeling information about ships

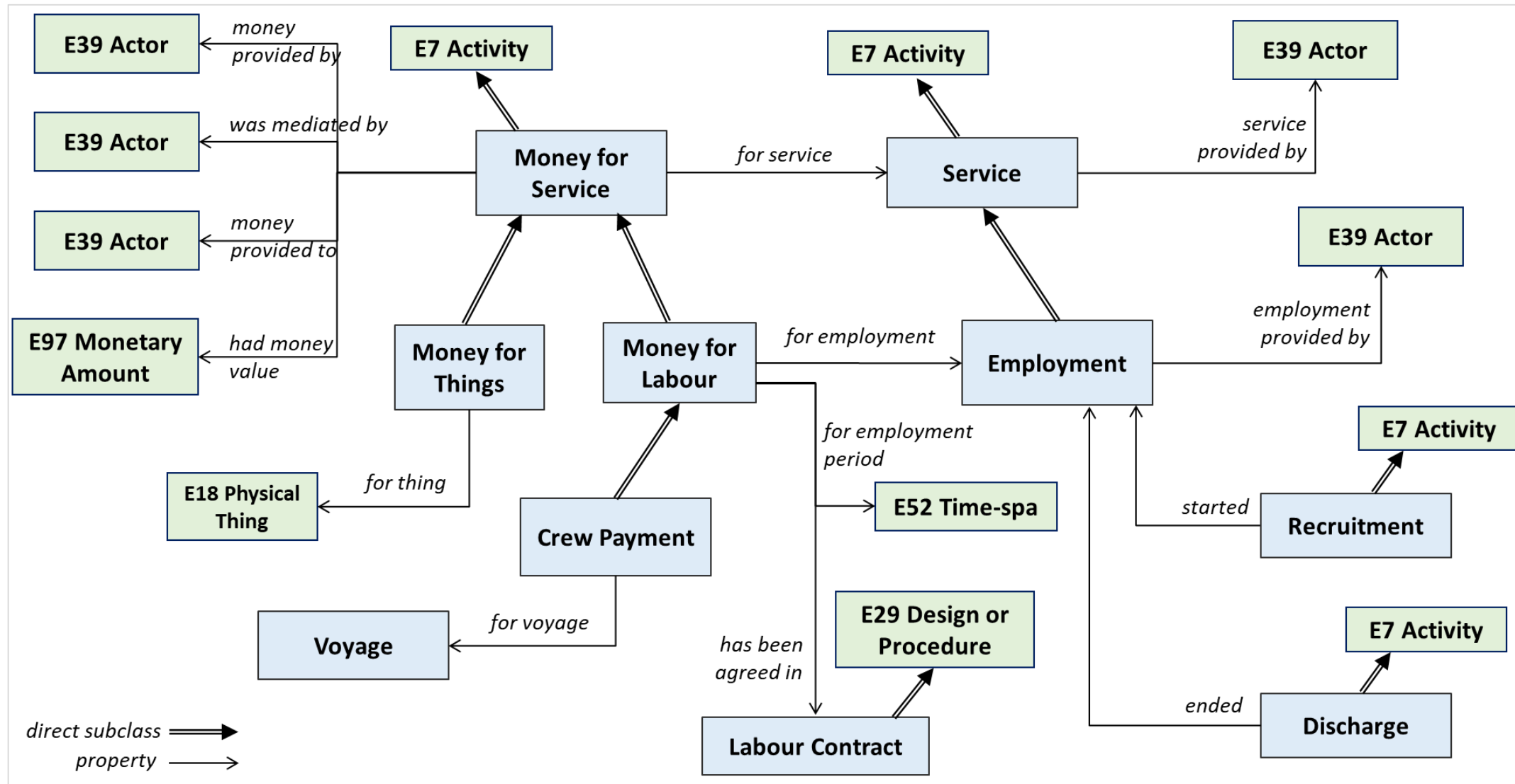




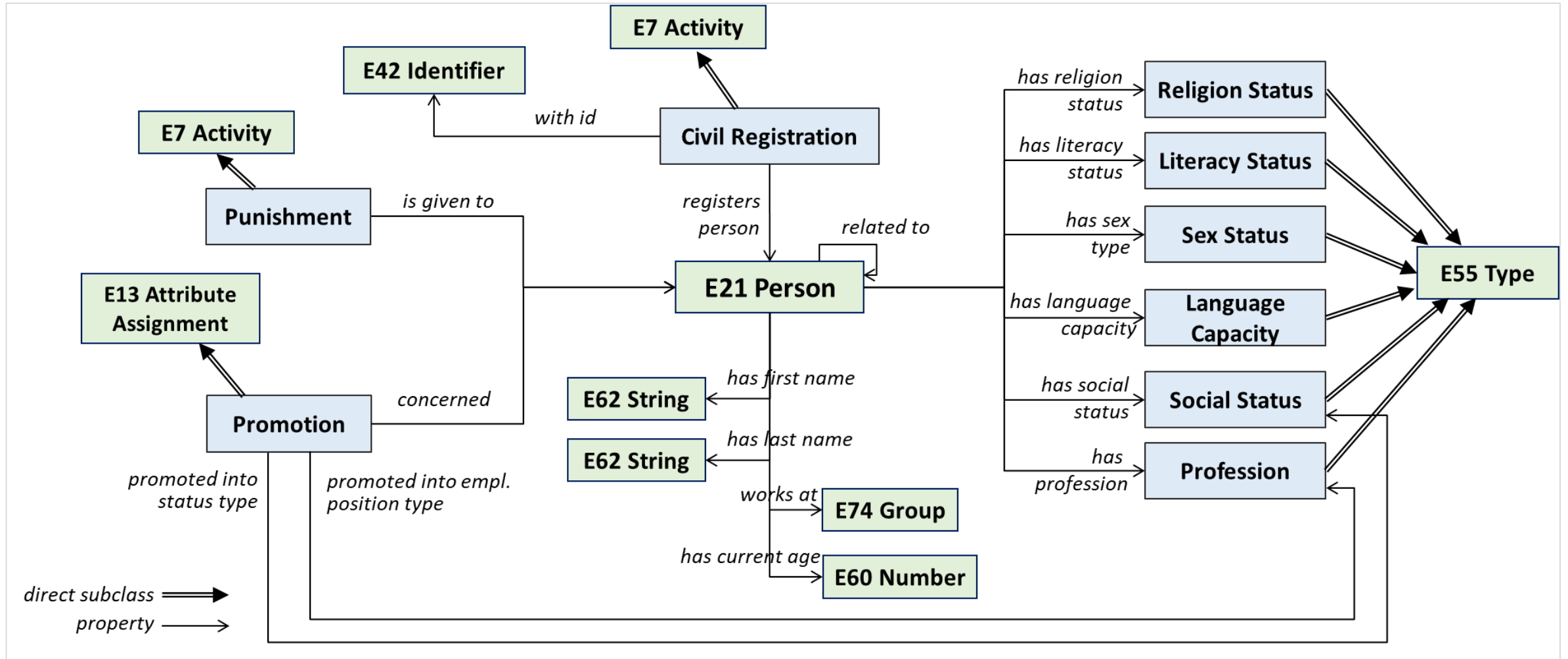
# The SeaLiT Ontology – Modeling information about voyages



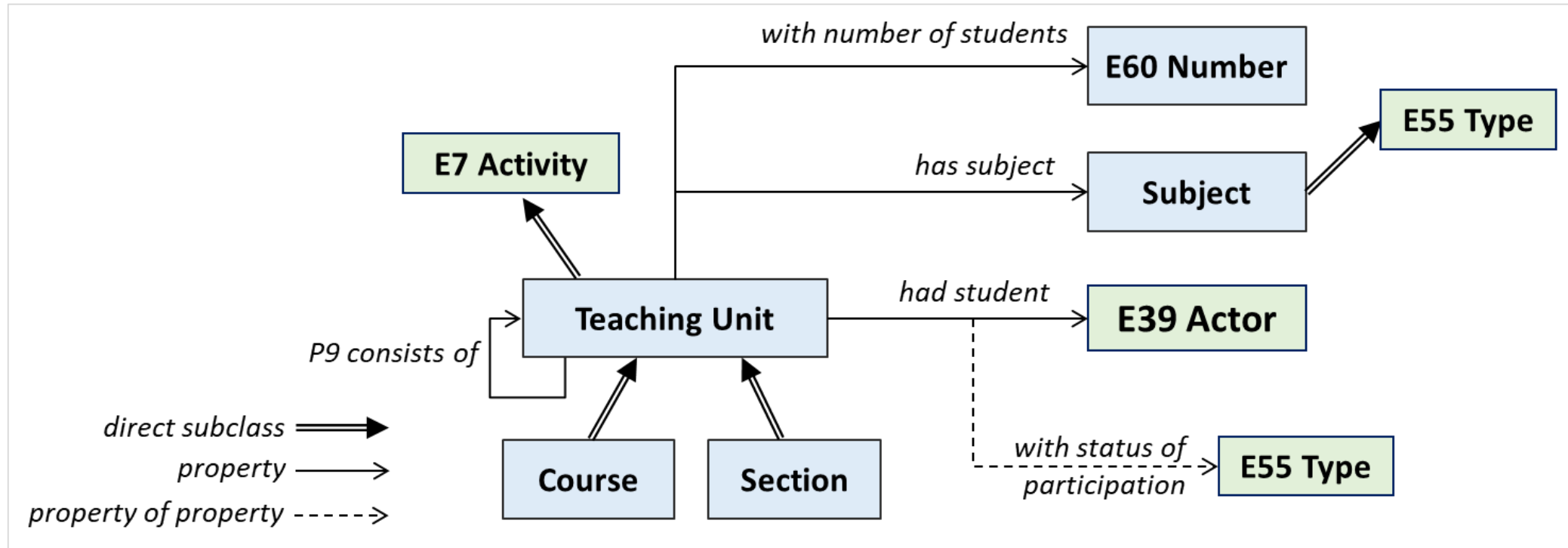
# The SeaLiT Ontology – Modeling information about payments



# The SeaLiT Ontology – Modeling information about persons



# The SeaLiT Ontology – Modeling information about teaching activities



# Application

# Semantic network exploration with ResearchSpace

<https://www.researchspace.org/>

The screenshot displays the SeaLiT - ResearchSpace Platform interface. The top navigation bar includes "Home / Search". The main content area shows a search query: "Find: People WAS CREW AT Ship where ships has ship type Brig". Below the query, a semantic network diagram is shown, consisting of two rows of nodes and relationships. The first row shows a "Person" node connected to a "Ship" node via the relationship "was crew at". The second row shows a "Ship" node connected to a "Brig" node via the relationship "has ship type". A "WHERE" box is positioned between the two rows. Below the diagram, the text "Found 1578 matches" is displayed. A "Filter Results" box is present, with the word "subject" below it. The results list includes "Achille Pagano", "Adriano Mansuetti", and "Agostino Aste".

SeaLiT - ResearchSpace Platform

Home / Search

Keyword search Semantic search

First national all-russian census of the russia

Shipyards of messengeries maritimes List

What do you want to find?

- Ship
- Person
- Legal Body
- Crew Payment
- Place
- Voyage
- Course
- Record
- Source

Find: People WAS CREW AT Ship where ships has ship type Brig

Person was crew at Ship

WHERE

Ship has ship type Features & Properties Brig

Show Filter

Found 1578 matches

Filter Results

subject

Achille Pagano

Adriano Mansuetti

Agostino Aste

<http://rs.sealitproject.eu/> (work in progress)

# Semantic network exploration with ResearchSpace

Show Filter

Found 1578 matches

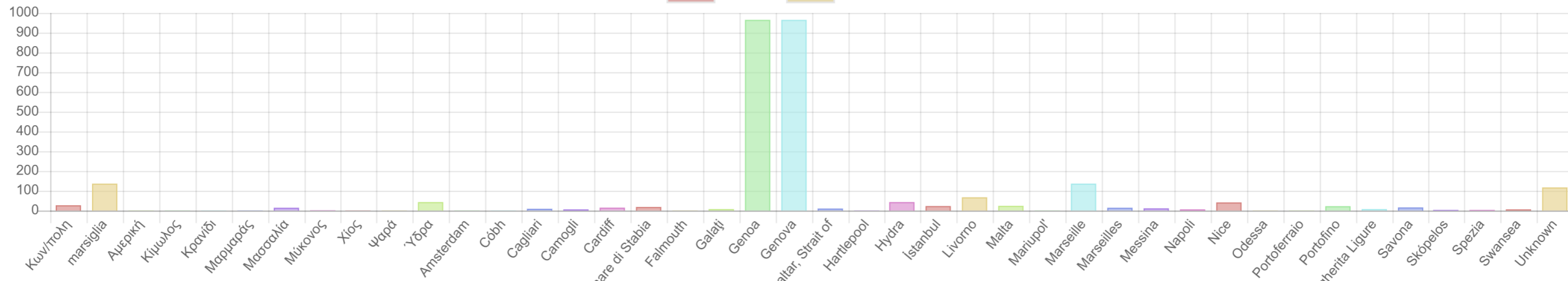
Timeline Chart List Rows Map Grid

Visualization Context

embarked at 

Line Bar Radar Pie Donut Download Save

- Kων/πολη marsiglia Αμερική Κίμωλος Κρανίδι Μαρμαράς Μασσαλία Μύκονος Χίος Ψαρά Ύδρα Amsterdam Cóbh Cagliari
- Camogli Cardiff Castellammare di Stabia Falmouth Galați Genova Genova Gibraltar, Strait of Hartlepool Hydra İstanbul Livorno Malta
- Mariupol' Marseille Marseilles Messina Napoli Nice Odessa Portoferraio Portofino Santa Margherita Ligure Savona Skópelos Spezia
- Swansea Unknown



<http://rs.sealitproject.eu/> (work in progress)

# More...

- Fafalios et al. “**FAST CAT: Collaborative Data Entry and Curation for Semantic Interoperability in Digital Humanities**”, ACM Journal on Computing and Cultural Heritage, 2021.  
PDF: <http://users.ics.forth.gr/~fafalios/files/pubs/fafaliosJOCCH2021.pdf>

- Petrakis et al. “**Digitizing, Curating and Visualizing Archival Sources of Maritime History: the case of ship logbooks of the 19th and 20th centuries**”, Drassana: revista del Museu Marítim, 2020.

PDF: <http://users.ics.forth.gr/~fafalios/files/pubs/Drassana-Article-Fafalios.pdf>



# Conclusion and Next Steps

# Conclusion and Next Steps

## □ SeaLiT Ontology

- An extension of CIDOC-CRM for the modeling and integration of **maritime history** information
- Built gradually by
  - ❖ analyzing large amounts of primary data (**archival sources of maritime history**)
  - ❖ considering **real needs of maritime historians** working in a large research project (SeaLiT)

DOI: <https://doi.org/10.5281/zenodo.5964240>

Namespace: <http://www.sealitproject.eu/ontology/>

## □ Next steps

- All constructs and scope notes are open to further elaboration / improvement
- Ontology extension/revision when new relevant sources appear and are analyzed
- Happy to discuss collaborations for continuing the work 😊

# Thank you!

Feel free to contact us:

- Athina Kritsotaki ([athinak@ics.forth.gr](mailto:athinak@ics.forth.gr))
- Pavlos Fafalios ([fafalios@ics.forth.gr](mailto:fafalios@ics.forth.gr))



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