SeaLiT Ontology

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

Version 1.1

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Table of Contents

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Introduction

Scope

This document defines the "**SeaLiT Ontology**", a formal ontology intended to facilitate the integration, mediation and interchange of heterogeneous information related to **maritime history**. It aims at providing the semantic definitions needed to transform disparate, localised information sources of maritime history into a coherent global resource. It also serves as a common language for domain experts and IT developers to formulate requirements and to agree on system functionalities with respect to the correct handling of historical information.

The ontology uses and extends the **CIDOC Conceptual Reference Model** (ISO 21127:2014), in particular version 7.1.1, as a general ontology of human activity, things and events happening in space and time (Doerr 2003).[1]

The **SeaLiT Ontology** has been developed following a *bottom-up* process from primary data collected in the context of the **SeaLiT Project** *(Seafaring Lives in Transition, Mediterranean Maritime Labour and Shipping, 1850s-1920s).*[2] SeaLiT is an international research project, funded by the ERC Starting Grant 2016 and hosted at the Institute of Mediterranean Studies (IMS) of the Foundation for Research and Technology – Hellas (FORTH). The project explores the transition from sail to steam navigation and its effects on seafaring populations in the Mediterranean and the Black Sea between the 1850s and the 1920s (Delis 2020). Historians in SeaLiT investigate, besides others, the maritime labour market, the evolving relations among ship-owners, captain, crew and local societies, and the development of new business strategies, trade routes and navigation patterns, during the transitional period from sail to steam. The main concepts on which the scientific research focuses, are the ships (including various information such as type, usage, dimensions, technology, etc.), the people related to the ships (such as sailors, ship-owners, relatives, firms) and the historical events/activities related to these (such as voyages, registrations, recruitments, payments). The archival sources that are studied range from *ship logbooks*, *crew lists*, *payrolls* and *civil/student registers* to *business records*, *account books* and *consulate reports*. Documents belonging to these sources are hand-written in various languages (including Spanish, Italian, French, Russian, Greek) and were gathered from relevant authorities in different countries. More information about the transcription, curation and exploitation of these archival documents can be found in the papers by Petrakis et al. (2020) and Fafalios et al. (2021).

Historians and researchers who study these historical documents are usually interested in combining information originated from multiple and diverse archival sources, in order to perform quantitative and qualitative analysis over aggregated information. The **SeaLiT Ontology** focuses on this goal, offering the means to translate the individual (isolated) data sources into a common well-managed source of integrated information (a rich *semantic network* / *knowledge graph*) that can support advanced data analysis and exploration, and the generation of new knowledge of historical value.

Status

The ontology presented in this document has been validated in the SeaLiT project through the creation of RDF knowledge graphs that make use of this data model, as well as through the development of a data exploration web application that operates over the knowledge graphs and allows historians of SeaLiT to explore the integrated data. More information about the creation of the knowledge graphs can be found in the paper by Fafalios et al. (2021).

All constructs and scope notes are open to further elaboration.

[1] https://www.cidoc-crm.org/
[2] http://www.sealitproject.eu/

Amendments from version 1.0 to version 1.1

Correction of the below typos in the names of classes used as domain or range in properties:

- De flagging → De-flagging
- De-Flagging → De-flagging
- Time-span → Time-Span
- Money For Service → Money for Service

Ontology Overview

The **SeaLiT Ontology** currently (version 1.1) contains 46 classes, 79 properties and 4 properties of properties, allowing the description of information about *ships*, *ship voyages*, *employments* and *payments*, *seafaring people*, *teaching units*/*courses*, as well as a plethora of other related activities and characteristics.

Figure 1 shows how information about a **ship** is modelled. A *Ship* (subclass of E22 Human-Made Object) is the result of a *Ship Construction* activity (subclass of E12 Production) which gave the *Ship Name* (subclass of E41 Appellation) to the ship. A *Ship* also has some characteristics, like *Horsepower* and *Tonnage* (subclasses of E54 Dimension), and is registered through a *Ship Registration* (subclass of E7 Activity) by a *Port of Registry* (subclass of E74 Group), with a ship flag of a particular *Country* (subclass of E53 Place) and with a particular *Ship ID* (subclass of E42 Identifier). Finally, a *Ship* has one or more *Ship Ownership Phases* (subclass of *Legal Object Relationship*), each one initialized by a *Ship Registration* and terminated by a *De-flagging* activity. Note here that, all classes related to activities (like *Ship Construction*, *Ship Repair*, *De-flagging*, etc.) can make use of the property '*P4 has time-span'* of CIDOC-CRM for describing temporal information.

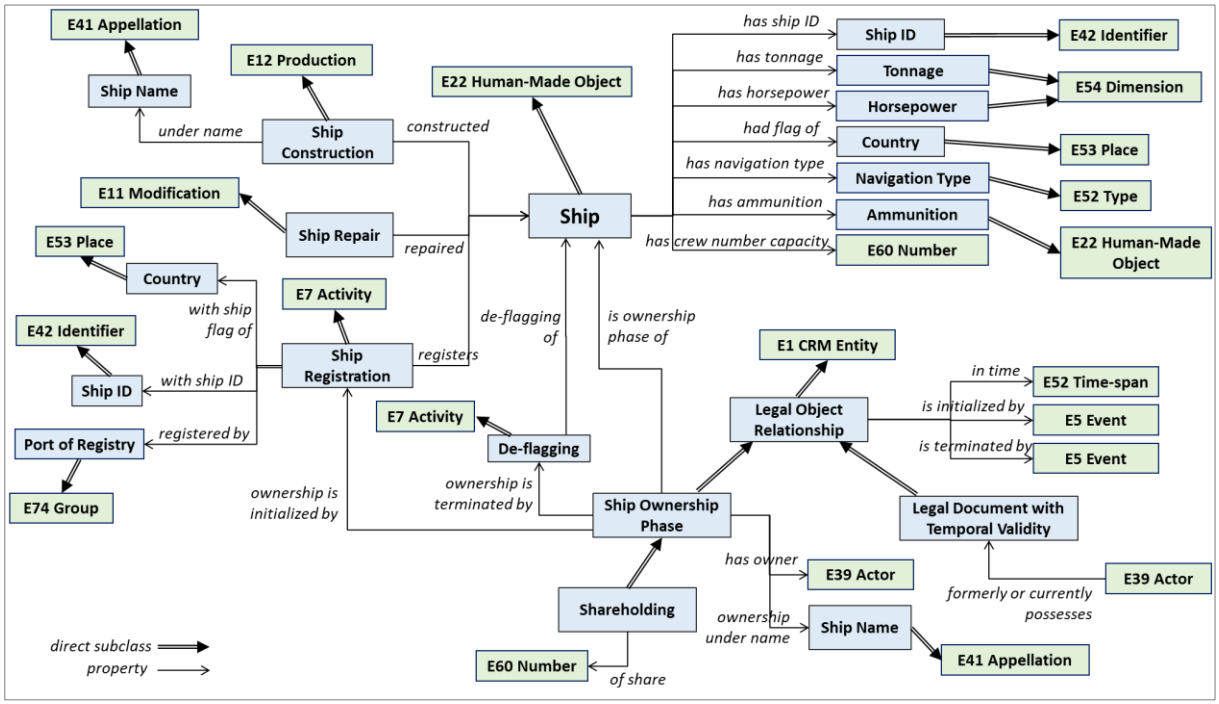

Figure 1: Modelling information about a ship.

Figure 2 shows how information about a **ship voyage** is modelled in the SeaLiT ontology. First, a *Voyage* (subclass of E7 Activity) concerns a particular *Ship*, navigated by one or more captains (E39 Actor), and has a *starting from* place, a *destination* place, and a *finally arriving at* place (E53 Place).[3] Then, the main activities during a ship

[3] Arriving at a different place from the one originally planned is quite common in historical voyages.

voyage include *Loading* things, *Leaving* from a place, *Passing* by or through a place, *Arrival* at a place, and *Unloading* things.

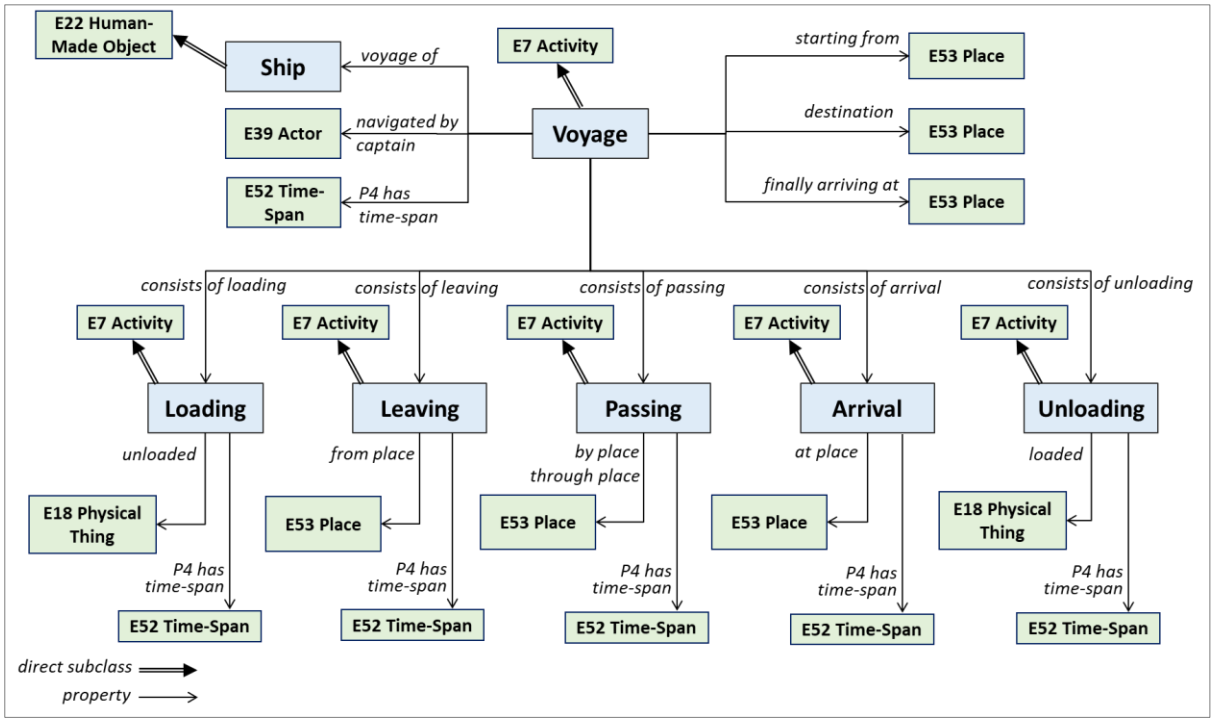

Figure 2: Modelling information about a ship voyage.

Figure 3 shows how the ontology allows describing information about employments and payments. *Money for Service* (subclass of E7 Activity) is given to an E39 Actor for a particular *Service* (subclass of E7 Activity). The class *Money for Service* has two specialisations (subclasses): *Money for Things* and *Money for Labour*, while the class *Employment* is a specialisation of the class *Service*. A *Crew Payment* concerns a particular *Voyage* and is a specialisation of *Money for Labour*. In this context, a *Labour Contract* (subclass of E29 Design or Procedure) specifies the conditions of *Money for Labour*. An *Employment* starts with a *Recruitment* (subclass of E7 Activity) and ends with a *Discharge* (subclass of E7 Activity).

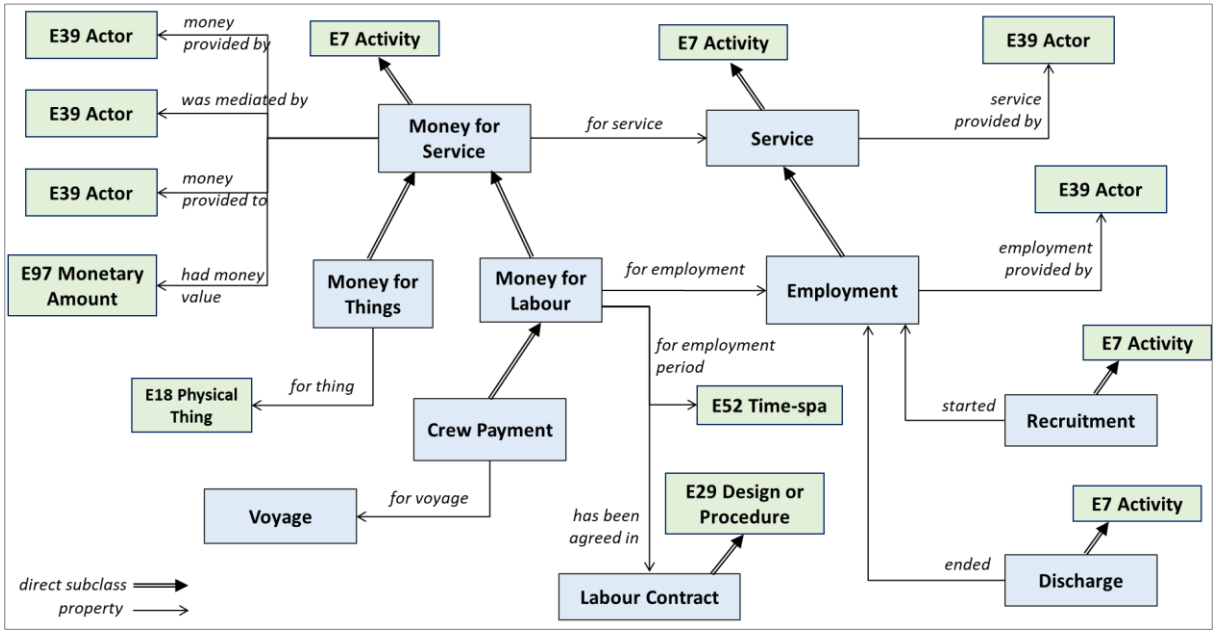

Figure 3: Modelling information about employments and payments.

Figure 4 shows how information about persons (seagoing people, such as captains, crew members, students, etc.) is modelled in the ontology. A person (E21 Person) is registered through a *Civil Registration* activity and receives an identifier (E42 Identifier). A person has a first name and last name (E62 String), works at an organisation or company (E74 Group), has an age (E60 Number) at a specific time (the time of the information recording) as well as a set of other properties, in particular a *Religion Status*, a *Literacy Status*, a *Sex Status*, *a Language Capacity*, a *Social Status*, and a *Profession* (all subclasses of E55 Type). The use of E55 Type as superclass of these properties/qualities is a good solution when the sources (such as a civil register or a census document) do not provide enough temporal information to infer/observe the corresponding event (this is exactly the case in the archival sources of the SeaLiT project). In addition, a *Punishment* or *Promotion* (subclasses of E7 Activity) can be given to a person. A *Promotion* is related either to a *Social Status* promotion or to a job/career (*Profession*) promotion.

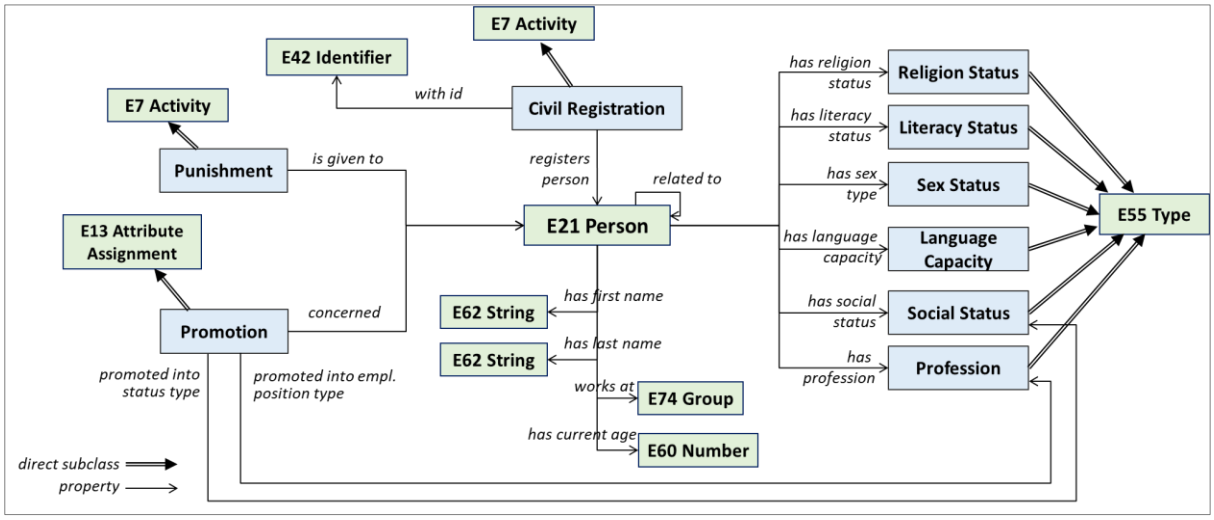

Figure 4: Modelling information about persons.

Finally, Figure 5 shows how the ontology allows describing information about teaching activities related to seafaring. A *Teaching Unit* is an activity that can be specialised to *Course* or *Section*. It is connected to a *Subject* (subclass of E55 Type), the students (E39 Actor) who participated in the teaching unit, the number of participating students (E60 Number), as well as one or more other teaching units through the CIDOC-CRM property 'P9 consists of' (this allows, in particular, describing the information that a *Course* consists of *Sections*).

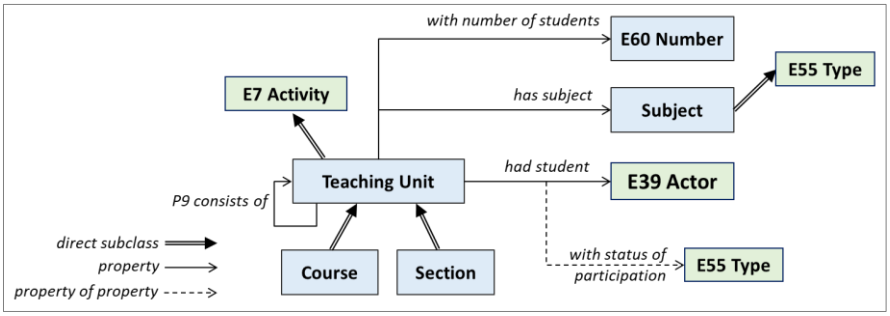

Figure 5: Modelling information about teaching activities.

SeaLiT Ontology Class Declarations

The classes are comprehensively declared in this section using the following format:

- Class names are presented as headings in bold face.
- The line “Subclass of:” declares the superclass of the class from which it inherits properties,
- The line “Superclass of:” is a cross-reference to the subclasses of this class.
- The line “Scope note:” contains the textual definition of the concept the class represents.
- The line “Examples:” contains a bulleted list of examples of instances of this class.
- The line “Properties:” declares the list of the class’s properties.
- Each property is represented by its forward name, and the range class that it links to, separated by colons.
- Inherited properties are not represented.
- Properties of properties, if they exist, are provided indented and in parentheses beneath their respective domain property.

Classes related to ships

Ship

Subclass of:

E22 Human-Made Object

Scope note:

This class comprises vessels, ships of different kinds, which can cross large open waters. Ships have been important contributors to human migration and commerce.

Examples:

- The steamship Adrianna

Properties:

has ship ID (ship ID identifies): Ship ID
has tonnage (is tonnage of): Tonnage
has horsepower (is horsepower of): Horsepower
had flag of (was flag of): Country
has navigation type (is navigation type of): Navigation Type
has ammunition (is ammunition of): Ammunition
has crew number capacity: E60 Number

Ship Construction

Subclass of: E12 Production

Scope note:

This class describes the activity of building new ships and other floating vessels. The ship construction information, in particular the location and date of construction, is the most reliable information (extracted from the source) that helps to identify a ship.

A very important methodological question is what information can be used to define the unique identity of a ship. The answer is that there does not exist a single information that can define it: it is always a matter of comparison of the sources and information. Even though, there is

information that is critical to the identity of a ship, such as the place and the year of construction.

Examples:

- The construction of ship Silenzio in 1827 in Venice

Properties:

under name (named with): Ship Name
constructed (was constructed by): Ship

Ship Repair

Subclass of:

E11 Modification

Scope note:

This class comprises activities that alter or change or restore/repair a ship.

Examples:

- Repair in the ground of ship Adamo in 1846

Properties:

repaired (was repaired by): Ship

Ship Registration

Subclass of:

E7 Activity

Scope note:

A ship acquires legal identity with the process of its registration, the register of its name, flag, id, dimensions and horsepower. The ownership information is documented in the registry book signed by the Port of Registry.

Examples:

- Registration of ship Kountouriotis in 1872

Properties:

with ship flag of (is flag of): Country
with ship ID (ship ID of): Ship ID
registers (is registered by): Ship
registered by (is responsible for registration): Port of Registry

Ship Ownership Phase

Subclass of:

Legal Object Relationship

Superclass of

Shareholding

Scope note:

This class comprises information about the ownership state of a ship. It consists of characteristics or properties of ownership. Ownership is a legal agreement, a kind of information that can be inferred/asserted and cannot be directly observed.

Ownership usually characterizes/assigns a name to a ship and a ship changes its name under an ownership state. Ownership phase can be traced by the ship registration activity that initiates it, and by the de-flagging activity that terminates the phase.

A single ship can have many owners (persons or/and companies).

Examples:

- Ownership phase of ship Andriana in 1910

Properties:

has owner (is owner of phase): E39 Actor
is ownership phase of (has phase): Ship
ownership under name (name with ownership): Ship Name
ownership is initialized by (initializes ownership): Ship Registration
ownership is terminated by (terminates ownership): De-flagging

Shareholding

Subclass of:

Ship Ownership Phase

Scope note:

This class describes the common phenomenon through periods in which ships share ownership. Therefore, if for example a person is allowed to possess up to 1/48 of a ship, it means that a single person could have many ships shares in the same time. Sometimes the leading owner has the absolute majority of the shares, sometimes only the relative majority; these are just assumptions/examples that this class can describe.

Examples:

- Shareholding of ship “Giovanni” in 1831 has shareholder Carolina Zotti with shares 4 caratti

Properties:

has shareholder (participates with share): E39 Actor
of share: E60 Number
is shareholding phase of (has shareholding): Ship

Legal Object Relationship

Subclass of:

E1 CRM Entity

Superclass of

Legal Document with Temporal Validity
Ship Ownership Phase

Scope note:

This class comprises legal object relationships of which the timespan and the state (of these

relationships) cannot be observed or documented. We can only observe these relationships through the events that initialize or terminate this state of relationship (starting event and terminating event). Basically, it comprises of characteristics/properties of a legal relationship which is the kind of information that can be inferred/asserted and not by temporal documentation of these properties.

Examples:

Ownership of ship Titania

Properties:

in time (is time of): E52 Time-Span
is initialized by (initializes): E5 Event
is terminated by (terminates): E5 Event

Legal Document with Temporal Validity

Subclass of:

Legal Object Relationship

Scope note:

This class comprises official documents or legal agreements that are valid for a specific timespan. The concept of this class includes licenses, official permissions, authorizations, etc., having a temporal validity.

Examples:

- Matteo Pilato's captain license 535/11-3-1855
- A K.CEMEH's passport 87 on 19/2/1907

De-flagging

Subclass of:

E7 Activity

Scope note:

De-flagging is regarded in this context as synonym to ship de-registration. When a ship is no longer flagged, this means that for a reason (e.g., demolished, shipwreck, lost, sold, etc.) the ship does not anymore sail under a legal state (of registration, having a flag).

Examples:

- Deflagging of ship Astore in 1862 due to fire

Properties:

de-flagging of (de-flagged in): Ship

Ship Name

Subclass of:

E41 Appellation

Scope note:

This class comprises the name that identifies a ship. The name of the ship can be changed

because of an ownership (so a ship can have many names through time).

Examples:

- “Anastasia”
- “Elleno”
- “Teofilo”
- “Asburgo”

Tonnage

Subclass of:

E54 Dimension

Scope note:

Tonnage is a measure of the cargo-carrying capacity of a ship. The sources refer to different kinds of tonnage, such as gross tonnage, net tonnage, etc. and through time, tonnage types may change. Tonnage may change during a reconstruction phase of a ship, for example.

Examples:

- 256 GRT (Gross Registered Tonnage)

Horsepower

Subclass of:

E54 Dimension

Scope note:

The power of the ship’s marine propulsion engine. The overall operation of the ship is highly dependent on the performance of its main propulsion engine, measured in terms of its power rating. There are various types of horsepower such as Nominal horsepower (NHP), Shaft horsepower (SHP), Indicated horsepower (IHP).

Examples:

- 120 hp

Ammunition

Subclass of:

E22 Human-Made Object

Scope note:

This class comprises information about the kinds and the number of guns of the ship at the moment of registration. The current documentation is mostly about merchant ships. With the beginning of the Greek Revolution in 1821, the Greek merchant fleet was transformed to military – consequently, there are also references to vessels that have ammunition during that period.

Examples:

- 7 cannons

Port of Registry

Subclass of:

E74 Group

Scope note:

This class describes the port (the issuing authority) that is responsible for a vessel registration.

Examples:

- Genova (the registration port of ship Adelaide)

Country

Subclass of:

E53 Place

Scope note:

This class describes the country, a place identified as a distinct entity in political geography.

Examples:

- Russia

Ship ID

Subclass of:

E42 Identifier

Scope note:

This class comprises numeric information assigned as registration number of a ship.

Examples:

- 8546 (the registration number of the ship Angelica)

Navigation Type

Subclass of:

E55 Type

Scope note:

This class comprises concepts denoted by terms used to characterize and classify a ship, in particular its navigation type, based on the long or short distances of travel.

Examples:

- cabotage
- altura

Classes related to ship voyages

Voyage

Subclass of:

E7 Activity

Scope note:

This class comprises information about the voyages of ships. Voyage is defined as the process of travelling from one place to another, staying there, usually for a short time; it is not a simple move/change from place to place; it is a movement in space and time (and it is documented as that[4]).

The same ship can sail many voyages during its lifetime. Voyage and route information is very important for historically investigating the various trade routes and navigation patterns used to exist in different times.

Voyage is an important aspect of the ship and the seaman, and generally of the seafaring life, both at *sea* and *ashore*.

Examples:

- the voyage of ship *Industria* from Messina to Odessa the period 02.03.1857 to 17.05.1858.

Properties:

voyage of (voyages): Ship
navigated by captain (navigated): E39 Actor
finally arriving at (is arrival place of): E53 Place
starting from (is starting place of): E53 Place
destination (is destination of): E53 Place
consists of leaving (leaving is part of): Leaving
consists of arrival (arrival is part of): Arrival
consists of passing (passing is part of): Passing
consists of loading (loading is part of): Loading
consists of unloading (unloading is part of): Unloading

Loading

Subclass of:

E7 Activity

Scope note:

[4] Possible types of ship movements that have been observed and documented in the sources are:
From A to B (start/end of voyage)
From A (start of voyage)
Through A and B
Through A
From A to B (intermediates)
To B (end of voyage)
To B (intermediate)
From A (intermediate)
Position at A
Pass by A

This class comprises loading activities as they are documented during the voyages (or as parts of the routes) of the ships.

It seems that the definition of a ship includes the notion of the loading of things; the procedures of loading/unloading are very important; the types of ships, the ports and the routes seem to define the types of loading, the dimensions, and the technology of loading/unloading and storage in ships.

Examples:

- Loading on 29/2/1908 of 20 barrels of wine (part of the voyage of ship *Andriana*)

Properties:

loaded (was loaded by): E18 Physical Thing

Unloading

Subclass of:

E7 Activity

Scope note:

This class comprises unloading activities as they are documented during the voyages (or as parts of the routes) of the ships.

The procedures of loading/unloading are very important; the types of ships, the ports and the routes seem to define the types of loading, the dimensions, and the technology of loading/unloading and storage in ships.

Examples:

- Unloading 20 barrels of wine on 20/3/1908 at Malta

Properties:

unloaded (was unloaded by): E18 Physical Thing

Arrival

Subclass of:

E7 Activity

Scope note:

This class comprises the arrival activity of a ship, which is a part, a stage of the overall voyage. It includes information about a place where the ship lands within a specific timeframe. It describes end points of the partial routes or within the overall voyage.

Examples:

- Arrival of the ship Adelaide at the port Genova on 1863-08-20

Properties:

at place (is place of arrival): E53 Place

Leaving

Subclass of:

E7 Activity

Scope note:

This class comprises the leaving of a ship, which is a part, a stage of the overall voyage. It includes information about a place from which the ship leaves within a specific timeframe. It describes start points of the partial routes or with the overall voyage.

Examples:

- Departure of the ship Adelaide from the port of Buenos Aires on date 1863-04-11

Properties:

from place (is place of leaving): E53 Place

Passing

Subclass of:

E7 Activity

Scope note:

This class comprises passing by (or through) activities of a ship at sea. This information helps to track the ships and the routes. Passing by or through is a part of the overall voyage. It includes information about places by/through which the ship passes within a specific timeframe.

Examples:

- Passing of the ship Adelaide through the strait of Gibraltar.
- Passing of the ship Adelaide by Ibiza island

Properties:

by place (is place of passing by): E53 Place
through place (is place of passing through): E53 Place

Duration

Subclass of: E54 Dimension

Scope note:

This class expresses the length of time in terms of indeterminacy of the duration value that can be approximated.

A duration may be expressed using all the parts of a date-time (from years to seconds) and can therefore be defined as a six-dimensional space. Because the relation between some of date parts is not fixed (such as the number of days in a month), the order relationship between durations is only partial, and the result of a comparison between two durations may be undetermined.

The same value may consists of different parts, such as 4 years, 10 months and 2 days.

Examples:

- 1 year, 2 months and 1 day (duration of a voyage)
- 4 months and 2 days (duration of sailor’s work on a ship)

Properties:

has duration value: E60 Number

Classes related to employments and payments

Money for Service

Subclass of:

E7 Activity

Superclass of

Money for Labour
Money for Things

Scope note:

This class comprises transaction activities in which actors pay/receive money for services.

Examples:

- Payment for goods loading
- Payment for telecommunication service
- Payment of captain's travel by rail (A class) from Barry Dock to Cardiff

Properties:

for service (service of): Service
had money value (was price of): E97 Monetary Amount
money provided by (provided money): E39 Actor
was mediated by (was mediator of): E39 Actor
money provided to (received money): E39 Actor

Money for Labour

Subclass of:

Money for Service

Superclass of

Crew Payment

Scope note:

This class comprises activities in which actors pay/receive money for services related to labour, human work, in order to earn wage.

Examples:

- Payment of a crew member for service on board
- Payment of a driver for driving services

Properties:

for employment (employment of): Employment
for employment period (is employment period of): E52 Time-Span
has been agreed in (is agreement for): Labour Contract

Money for Things

Subclass of:

Money for Service

Scope note:

This class comprises transaction activities in which actors pay/receive money for services related to things, such as purchase of foods, etc.

Examples:

- Syrmas paying 53 francs for soap in 1896

Properties:

for thing (thing of): E18 Physical Thing

Crew Payment

Subclass of:

Money for Labour

Scope note:

This class comprises information about the wage payments of the people that are members of the crew of a ship.

Examples:

- Payment of 1,305 francs (total wage) to Ioannis Goulandris for service on board as captain of the ship "Ελλην" (steamer) the period 27/03/1913-23/06/1913.

Properties:

for voyage (motivated payment): Voyage

Labour Contract

Subclass of:

E29 Design or Procedure

Scope note:

This class comprises plans expressed in a document that specifies the employment conditions.

Examples:

- The labour contract G255/81 between German trading company and sailors including the negotiations in the Imperial German Consulate for Southsea Islands, Apia (1897/98)
- The labour contract 4781 A - 99/PO 18/76-78 describing the service of Richard Martin to Richard Spettigue under a yearly agreement.

Service

Subclass of:

E7 Activity

Superclass of

Employment

Scope note:

Service is the willing, the capability to offer a service, by some instance of E39 Actor, independently if it is executed or not. This offer is declared at the request of another instance of E39 Actor.

Examples:

- K.A military service on 10/1/1905
- Service on board on 5/1900

Properties:

service provided by (provided service): E39 Actor
(in the role of: E55 Type)

Employment

Subclass of:

Service

Scope note:

This class comprises information about employment services between two parties, usually based on a contract where work is paid for.

In the context of the SeaLiT project, it comprises information about the employment services provided on board. This relationship is initiated by the recruitment of the sailor man and is terminated by the discharge/disembarkation of this worker.

Examples:

- 1.6.1857-1.5.1859 Циновский Антон's employment/service as an engineer in the ship *Запасной*.

Properties:

employment provided by (provided employment): E39 Actor

Recruitment

Subclass of:

E7 Activity

Scope note:

This class comprises the process of hiring and bringing new staff member to work for a company, or to become a new member of an organization.

In the context of the SeaLiT project, which explores data regarding employments records with lists of maritime personnel, a recruitment is specifically defined in the sense of on board employment. Recruitment or embarkation is the activity that usually starts a sailor's employment service.

There is information from sources, such as from the *Maritime Register of the State for La Ciotat (matricule des maîtres au cabotage)*, referring that they used to have "recruitment" systems that registered every man 18 years old and up, or a younger boy (as apprentice), exercising one of the maritime professions for over a year, at the Navy's disposal, in case of a war. On the same time, the state provided many privileges in return for service in the navy, such as tax exemptions, military pensions, free education and life insurance for the families of listed seamen.

Examples:

- L.S boarding on 12/10/1908
- Antonio Revello's embarkation in Genova on 2.03.1857

Properties:

started (started by): Employment

Discharge

Subclass of:

E7 Activity

Scope note:

This class comprises the termination of a working relationship, the ending of an employee to provide service.

In the context of the SeaLiT project, which explores data regarding employments records with lists of maritime personnel, a discharge is specifically defined in the sense of disembarkation, which is the activity that usually terminates a sailor's employment service.

Examples:

- Schiaffino Alberto's discharge at Marsiglia on 03/12/1868

Properties:

ended (ended by): Employment

Classes related to persons

Civil Registration

Subclass of:

E7 Activity

Scope note:

Civil registration stands for legal processes of registering persons in various contexts. The outcomes of this process are legal documents such as civil acts of birth or death, or other documents (such as Register of Entries in shipyards), which usually have a period of validity.

Examples:

- J.Ibars's registration to the organisation of military service in 1911.

Properties:

with ID (ID of): E42 Identifier
registers person (person is registered by): E21 Person

Promotion

Subclass of:

E13 Attribute Assignment

Scope note:

This class comprises activities that result in the promotion, the advancement of an employee within a company position or job tasks or in a higher ranking as a reward for good performance. It is typically associated with a higher rate or a financial bonus.

Examples:

- R. Morales promotion on 1902-04-02.

Properties:

concerned (was promoted by): E21 Person
promoted into status type (status type was promoted by): Social Status
promoted into employment position type (employment position type was promoted by): Profession

Punishment

Subclass of:

E7 Activity

Scope note:

This class comprises instances of punishments in terms of public policy, defined by an authority, as a response to a particular action that is deemed undesirable or unacceptable. Examples of penalties for punishment are prison, or loss of a privilege or of a status, etc.

Examples:

- J. Campos's military penalty on 1907- 02-02

Properties:

is given to (was punished by): E39 Actor

Profession

Subclass of:

E55 Type

Scope note:

This class comprises information about the person profession, work, career or job, as it was written inside the original source.

Examples:

- impiegato private
- ispettore nautico in Capo
- capitano secondo

Social Status

Subclass of:

E55 Type

Scope note:

This class comprises a person's social status, as it was written inside the original source. This can include different kinds of social status, such as marital status or estate. In such cases of further classification, these concepts can be used as instances of the Social Status class.

This class extends E55 Type in order to refine the meaning of this specific concept (social status). This concept is sufficiently stable and associated with additional explicitly modelled property specific to it (*"has social status"*). An alternative mechanism is to specialize the

classification of Social Status instances to any level of detail, by linking to external vocabulary sources, thesauri, classification schemas or ontologies.

In general, a good practice for concepts that are not user defined metaclasses, would be to be treated as particulars with the relationship P2 has type.

Examples:

- married man (of kind marital status)
- peasant (of kind estate)

Literacy Status

Subclass of:

E55 Type

Scope note:

This class comprises concepts denoting a person's literacy status.

Examples:

- literate
- illiterate

Sex Type

Subclass of:

E55 Type

Scope note:

The gender of a person.

Examples:

- female
- male

Language Capacity

Subclass of:

E55 Type

Scope note:

This class comprises concepts denoting a person knowledge of various languages.

Examples:

- Armenian
- Lithuanian

Religion Status

Subclass of:

E55 Type

Scope note:

This class comprises concepts used to characterize the religious affiliation of a person.

Examples:

- Catholic
- Christian

Classes related to teaching activities

Teaching Unit

Subclass of:

E7 Activity

Superclass of:

Course
Section

Scope note:

This class comprises information about the school year, the period of time during which the school holds classes and offers courses. It is a period of educational activities.

Examples:

- the school year 1852-53

Properties:

has subject (is subject of): Subject
with number of students: E60 Number
had student (student in): E39 Actor
(with status of participation: E55 Type)

Course

Subclass of:

Teaching Unit

Scope note:

This class comprises information about courses, teaching units divided and organized for educational purposes.

Examples:

- Sezione Commerciale
- Nautica

Section

Subclass of:

Teaching Unit

Scope note:

This class comprises information about sections of lessons. Some courses are divided into

multiple sections.

Examples:

- 3o corso

Subject

Subclass of:

E55 Type

Scope note:

This class comprises information about the scientific subjects of the courses that were taught at a specific semester.

Examples:

- Lingua Italiana
- Ancient History

SeaLiT Ontology Property Declarations

The properties are comprehensively declared in this section using the following format:

- Property names are presented as headings in bold face.
- The line “Domain:” declares the class for which the property is defined.
- The line “Range:” declares the class to which the property points, or that provides the values for the property.
- The line “Subproperty of:” declares the superproperty of the property. If a property P is a subproperty of property P', then all pairs of resources which are related by P are also related by P'.
- The line “Superproperty of:” is a cross-reference to any subproperties the property may have.
- The line “Scope note:” contains the textual definition of the concept the property represents.
- The line “Examples:” contains a bulleted list of examples of instances of this property.
- The line “Properties:” declares the list of the property’s properties (if any).

Properties related to ships

has ship ID (ship ID identifies)

Domain:

Ship

Range:

Ship ID

Subproperty of:

P1 is identified by (identifies)

Scope note:

This property describes the identification of a ship by an identifier. This property does not reveal anything about when, where and by whom this identifier was used. A more detailed representation can be made using the fully developed path through Ship Registration.

The property is a shortcut for the path *Ship – is registered by: Ship Registration – with ship ID: Ship ID*.

Examples:

- Ship Kountouriotis *has ship ID* 109.

has tonnage (is tonnage of)

Domain:

Ship

Range:

Tonnage

Subproperty of:

P43 has dimension (is dimension of)

Scope note:

This property provides the tonnage dimension of a ship.

Examples:

- Ship Kountouriotis *has tonnage* 299 (tonellagio di registro brutto).

has horsepower (is horsepower of)

Domain:

Ship

Range:

Horsepower

Subproperty of:

P43 has dimension (is dimension of)

Scope note:

This property records the horsepower dimension of a ship.

Examples:

- The ship Catalina *has horsepower* 120 (indicated horsepower).

had flag of (was flag of)

Domain:

Ship

Range:

Country

Scope note:

This property associates an instance of a Ship with an instance of the country of which this ship becomes property and consequently acquires this country's flag.

The property is a shortcut of the full path *Ship – is registered by: Ship Registration – with ship flag of: Country*.

Examples:

- Ship Eleni Kouppa *had flag of* Greece.

has navigation type (is navigation type of)

Domain:

Ship

Range:

Navigation Type

Subproperty of:

P2 has type (is type of)

Scope note:

This property describes the navigation type of the ship. It allows a form of specialisation through the use of a terminological hierarchy, or thesaurus.

Examples:

- Ship Catalina (of type Corbeta) *has navigation type* Altura.

has ammunition (is ammunition of)

Domain:

Ship

Range:

Ammunition

Subproperty of:

P46 is composed of (forms part of)

Scope note:

This property associates a ship with the ammunition that it is equipped with.

Examples:

- The ship Alessandra *has ammunition* 4 cannons.

has crew number capacity

Domain:

Ship

Range:

E60 Number

Scope note:

This property specifies the numbers of workers/sailors authorized to work on board.

Examples:

- The ship Catalina *has crew number capacity* 33.

under name (named with)

Domain:

Ship Construction

Range:

Ship Name

Scope note:

This property identifies the name of the ship with the ship construction information.

Examples:

- “Construction of ship Silenzio in 1827 in Venice” *under name* “Silenzio”.

constructed (was constructed by)

Domain:

Ship Construction

Range:

Ship

Subproperty of:

P108 has produced (was produced by)

Scope note:

This property identifies a ship that came into existence as a result of a construction event.

Examples:

- "Construction of the ship Ada in Inglaterra in 1855" *constructed* "Ship Ada".

with ship flag of (is flag of)

Domain:

Ship Registration

Range:

Country

Scope note:

This property identifies the country represented in the ship flag of a Ship Registration activity.

Examples:

- "Ship registration by Austrian Empire" *with ship flag of* "Austria".

with ship ID (ship ID of)

Domain:

Ship Registration

Range:

Ship ID

Scope note:

This property records the ship identifier assigned by a Ship Registration activity.

Examples:

- Registration of ship Catalina *with ship ID* 107.

registers (is registered by)

Domain:

Ship Registration

Range:

Ship

Scope note:

This property associates a ship and the ship registration activity that registered and identified it.

Examples:

- "Ship registration of Kountouriotis in 1872" *registers* "Ship Kountouriotis".

registered by (is responsible for registration)

Domain:
Ship Registration

Range:
Port of Registry

Subproperty of:
P14 carried out by (performed)

Scope note:
This property describes the authority, the port of registry, which is responsible for the registration of a ship.

Examples:
- "Ship registration of Kountouriotis in 1872" *registered by* "Port of Registry of Hydra".

has owner (is owner of phase)

Domain:
Ship Ownership Phase

Range:
E39 Actor

Superproperty of:
has shareholder (participates with share)

Scope note:
This property describes information about the owner, the person or the company (shipping enterprise), of a ship. In the context of the SeaLiT project, we make the hypothesis that the owner as a concept, implies a legal entity, so in that sense, a person is the minimum legal entity-company (with members himself/herself) of a ship.

Examples:
- "Ownership phase of ship Industria in 1890" *has owner* "Schiaffino Prospero & Co".

is ownership phase of (has ownership phase)

Domain:
Ship Ownership Phase

Range:
Ship

Superproperty of:
is shareholding phase of (has shareholding)

Scope note:

This property associates a ship with the different ownership phases related to it.

Examples:

- "Ownership phase of ship Andriana in 1910" *is ownership phase of* "Ship Andriana".

ownership under name (name with ownership)

Domain:

Ship Ownership Phase

Range:

Ship Name

Scope note:

This property identifies the change of ship name because of an ownership phase. It can be used to provide previous/old names of a ship.

Examples:

- "Ownership of ship Silenzio by Domenico Mareglia" *ownership under name* "Mortar".

ownership is initialized by (initializes ownership)

Domain:

Ship Ownership Phase

Range:

Ship Registration

Subproperty of:

is initialized by (initializes)

Scope note:

This property associates the beginning of an instance of Ship Ownership Phase with the Ship Registration that initiates it.

Examples:

- "Ownership of ship Silenzio by Domenico Mareglia" *ownership is initialized by* "Registration of ship Silenzio".

ownership is terminated by (terminates ownership)

Domain:

Ship Ownership Phase

Range:

De-flagging

Subproperty of:

is terminated by (terminates)

Scope note:

This property associates the end of existence of an instance of Ship Ownership Phase with a De-flagging event that terminates it.

Examples:

- "Ownership of ship Silenzio by Domenico Mareglia" *ownership is terminated by* "De-flagging of ship Silenzio because of sale".

has shareholder (participates with share)

Domain:

Shareholding

Range:

E39 Actor

Subproperty of:

has owner (is owner of phase)

Scope note:

This property associates an actor with the activity of participating in an ownership with shares. It implies that a phase of a shareholding represents one participation of a share by an actor. This means that if for a ship there are more than one shareholders, there will be consequently same number of shareholding phases. If we want to describe the sum of the shares of the shareholding for a ship in a specific timespan, then we will describe a composite shareholding activity that consists of individual shareholding activities of shares.

Examples:

- Shareholding of brigantino Amistad in 1864 *has shareholder* Carlo Massimiliano.

of share

Domain:

Shareholding

Range:

E60 Number

Scope note:

This property describes the number of shares hold by an owner.

Examples:

- Shareholding of ship Giovanni in 1831 *of share* 4 caratti.

is shareholding phase of (has shareholding)

Domain:

Shareholding

Range:

Ship

Subproperty of:

is ownership phase of (has ownership phase):

Scope note:

This property associates a shareholding phase to a particular ship.

Examples:

- Shareholding of ship Giovanni in 1831 by Carolina Zotti *is shareholding phase of* ship Giovanni.

in time (is time of)

Domain:

Legal Object Relationship

Range:

E52 Time-Span

Scope note:

This property describes the inferred time-span of a legal object relationship, which cannot be observed or documented. It is implicit knowledge.

Examples:

- "Passport A/108 of J. Moses" *in time* "1849".

is initialized by (initializes)

Domain:

Legal Object Relationship

Range:

E5 Event

Superproperty of:

ownership is initialized by (initializes ownership)

Scope note:

This property associates the beginning of an instance of Legal Object Relationship with an explicit event initiating it.

Examples:

- The Titania ship ownership *is initialized by* the registration of ship Titania in 1845.

is terminated by (terminates)

Domain:

Legal Object Relationship

Range:

E5 Event

Superproperty of:

ownership is terminated by (terminates ownership)

Scope note:

This property associates the end of existence of an instance of Legal Object Relationship with an explicit event that terminates it.

Examples:

- The Titania ship ownership is terminated by the sale of the ship Titania on 04/05/1855.

formerly or currently possesses (is formerly or currently possessed by)

Domain:

E39 Actor

Range:

Legal Document with Temporal Validity

Scope note:

This property associates an instance of a Legal Document with Temporal Validity with the instance of an Actor that formerly or currently possesses it, at the time of validity of the record or database containing the statement that uses this property. The property does not allow any indication of how long the legal document with temporal validity has been possessed by the specific Actor.

Examples:

- Pilato Matteo *formerly or currently possesses* driving licence No 535, 11 Marzo 1855.

repaired (was repaired by)

Domain:

Ship Repair

Range:

Ship

Subproperty of:

P31 has modified (was modified by)

Scope note:

This property identifies a ship repaired by a ship repair activity.

Examples:

- “Repair in the ground of ship Adamo in 1846” *repaired* “Ship Adamo”.

de-flagging of (de-flagged in)

Domain:

De-flagging

Range:

Ship

Scope note:

This property associates an instance of a ship with the instance of the de-flagging activity that de-registered it.

Examples:

- "Deflaggin of ship Astore in 1862 (due to fire)" is a *de-flagging of* "Ship Astore".

Properties related to ship voyages

voyage of (voyages)

Domain:

Voyage

Range:

Ship

Subproperty of:

P12 occurred in the presence of (was present at)

Scope note:

This property describes the voyage of a ship, its movement/travelling at sea.

Examples:

- "Voyage of ship Industria (brick) from 1861-02-15 to 1861-10-23" is a *voyage of* "Ship Industria".

navigated by captain (navigated)

Domain:

Voyage

Range:

E39 Actor

Subproperty of:

P14 carried out by (performed)

Scope note:

This property describes the participation of an E39 Actor as being responsible for the navigation of the voyage. The captain may change from voyage to voyage. The concept of the captain is normally synonym to the concept of ruling, of the power of governing, so in that sense should be mapped to the E74 Group. But, in the context of the SeaLiT project, there is the requirement for a simpler structure with more details on the biographic data of a captain, so the decision is to model the captain as a role by person (not by group).

Examples:

- The voyage of ship Industria (1857-1858) with destination Nizza was *navigated by* captain Schiaffino Giacomo.

finally arriving at (is arrival place of)

Domain:

Voyage

Range:

E53 Place

Scope note:

This property identifies the final place (end) of a voyage. It is the actual arrival place, meaning it does not refer to the original destination place but the place to which the ship finally arrived.

Examples:

- "Voyage of ship Asimoula in 1882" *finally arriving at* "Istanbul".

starting from (is starting place of)

Domain:

Voyage

Range:

E53 Place

Scope note:

This property describes the spatial location from which a voyage started. It is the beginning of the route.

Examples:

- "Voyage of ship Asimoula in 1882" *starting from* "Taragona".

destination (is destination of)

Domain:

Voyage

Range:

E53 Place

Scope note:

This property describes the intended place where the voyage, theoretically, according to the maps and the plans should end. It is the planned destination of the route, which may change in reality.

Examples:

- The voyage of ship Industria in 1857 had *destination* Nizza.

consists of leaving (leaving is part of)

Domain:

Voyage

Range:

Leaving

Subproperty of:

P9 consists of (forms part of)

Scope note:

This property allows an instance of a Voyage to be analysed into parts such as leaving activities. It is a subproperty of P9 consists of (forms part of). This analysis of parts of the voyage contributes to the route analysis, which provides information about specific navigation patterns of the ship.

Examples:

- The voyage of ship Andriana the period 9-31/3/1908 *consists of leaving* from the port of Buenos Aires on 9/3/1908.

consists of arrival (arrival is part of)

Domain:

Voyage

Range:

Arrival

Subproperty of:

P9 consists of (forms part of)

Scope note:

This property allows an instance of a Voyage to be analysed into parts such as arrival activities. It is a subproperty of P9 consists of (forms part of). This analysis of parts of the voyage contributes to the route analysis, which provides information about specific navigation patterns of the ship.

Examples:

- The voyage of ship Andriana the period 9-31/3/1908 *consists of arrival* at the port of Buenos Aires on 20/3/1908.

consists of passing (passing is part of)

Domain:

Voyage

Range:

Passing

Subproperty of:

P9 consists of (forms part of)

Scope note:

This property allows an instance of a Voyage to be analysed into parts such as passing by/through activities. It is a subproperty of P9 consists of (forms part of). This analysis of parts of the voyage contributes to the route analysis, which provides information about specific navigation patterns of the ship

Examples:

- The voyage of ship Andriana the period 9/3-31/3/1908 *consists of passing* by Malta on 15/3/1908.

consists of loading (loading is part of)

Domain:

Voyage

Range:

Loading

Subproperty of:

P9 consists of (forms part of)

Scope note:

This property allows an instance of a Voyage to be analysed into parts such as loading activities. It is a subproperty of P9 consists of (forms part of). The activities of loading/unloading happen ashore, before, in between, or after (with the end) of the voyage of a ship and are part of its definition.

Examples:

- The voyage of ship Andriana the period 9/3-31/3/1908 *consists of loading* wood on 15/3/1908.

consists of unloading (unloading is part of)

Domain:

Voyage

Range:

Unloading

Subproperty of:

P9 consists of (forms part of)

Scope note:

This property allows an instance of a Voyage to be analysed into parts such as unloading activities. It is a subproperty of P9 consists of (forms part of). The activities of loading/unloading happen ashore, before, in between, or after (with the end) of the voyage of a ship and are part of its definition.

Examples:

- The voyage of ship Andriana the period 9/3-31/3/1908 *consists of unloading* wood on 29/03/1908 at Soulinas port.

loaded (was loaded by)

Domain:

Loading

Range:

E18 Physical Thing

Scope note:

This property associates an instance E18 Physical Thing with an instance of the loading activity that moved (loaded) it.

Examples:

- "Loading on 29/2/1908 of ship Andrea at Malta" *loaded "*3450 tonnage of wheat".
- "Loading on 10/10/1906 of ship Andrea at Malta" *loaded* "50 sheep".

unloaded (was unloaded by)

Domain:

Unloading

Range:

E18 Physical Thing

Scope note:

This property associates an instance of E18 Physical Thing with an instance of the unloading activity that moved (unloaded) it.

Examples:

- "Unloading on 20/3/1908 of ship Andrea at Malta" *unloaded "*1500 pipes of oil".

at place (is place of arrival)

Domain:

Arrival

Range:

E53 Place

Scope note:

This property describes the spatial location of an arrival.

Examples:

- Arrival of Andriana on 15/3/1908 *at place* Andros.

from place (is place of leaving)

Domain:

Leaving

Range:

E53 Place

Scope note:

This property describes the spatial location from which leaving (of ship) was documented. The description of this type of movement provides information about the route analysis.

Examples:

- Leaving of Andriana on 9/3/1908 *from place* Genoa

by place (is place of passing by)

Domain:

Passing

Range:

E53 Place

Scope note:

This property associates an instance of a place with an instance of a passing activity by that place. This class provides information about the types of movements of a ship, which are parts of the route (of the voyage), and are documented as that.

Examples:

- Passing of Andriana on 16/3/1908 *by place* Istanbul.

through place (is place of passing through)

Domain:

Passing

Range:

E53 Place

Scope note:

This property associates an instance of a place with an instance of a passing activity through that place. This class provides information about the types of movements of a ship, which are parts of the route (of the voyage), and are documented as that.

Examples:

- Passing of Andriana on 16/3/1908 *through place* Vosporos (straits).

had duration (duration of)

Domain:

E52 Time-Span

Range:

Duration

Subproperty of:

P191 had duration (was duration of)

Scope note:

This property describes the length of time covered by an E52 Time-Span. It allows an E52 Time-Span to be associated with a duration (as a dimension, an interval) independent from the actual beginning and end.

Examples:

- Voyage of ship Andriana from 9/3/1908 to 31/3/1908 *had duration* 22 days.

has duration value

Domain:

Duration

Range:

E60 Number

Subproperty of:

P90 has value

Scope note:

This property allows an instance of Duration to be approximated by an instance of E60 Number primitive that provides the duration value of a time-span. The value can be expressed in multiple units (such as *"2 months and 5 days"* or *"3 years and 10 months"*), thus it is proposed to be implemented in RDFS following ISO 8601[5] and xsd:duration[6] (form: PnYnMnDTnHnMnS).

Examples:

- "Duration of voyage of ship Andriana from 9/3/1908 to 19/4/1908" *had duration value* "1 month and 10 days".

Properties related to employments and payments

for service (service of)

Domain:

Money for Service

Range:

Service

Superproperty of:

for employment (employment from)

Scope note:

This property describes a Money for Service activity that pays/receives money for Services.

Examples:

- "Syrmas paying 50 pounds sterling" *for service* "the policing of ship".

[5] https://en.wikipedia.org/wiki/ISO_8601
[6] https://www.w3.org/TR/xmlschema-2/#duration

had money value (was price of)

Domain:

Money for Service

Range:

E97 Monetary Amount

Scope note:

This property describes the Monetary Amount paid (i.e., the cost) for a specific Money for Service activity.

Examples:

- "Syrmas paying 50 pounds for policing" *had money value* "50 pounds".

money provided by (provided money)

Domain:

Money for Service

Range:

E39 Actor

Subproperty of:

P14 carried out by (performed)

Scope note:

This property identifies the E39 Actor that paid (gave money) for a specific service (Money for Service).

Examples:

- "Paying 50 pounds for policing" *money provided by* "A. Syrmas".

was mediated by (was mediator of)

Domain:

Money for Service

Range:

E39 Actor

Subproperty of:

P14 carried out by (performed)

Scope note:

This property identifies the E39 Actor that participated in the transaction (Money for Service activity) in the role of a mediator. For example, there are sources that refer that seamen used to provide money to the captain of the ship in order that the wives to receive these money (so the captain was the mediator of this transaction).

Examples:

- "Paying 500 lira for Petrakis service on board on 9/5/1908" *was mediated by* "A. Syrmas (captain)".

money provided to (received money)

Domain:
Money for Service

Range:
E39 Actor

Subproperty of:
P14 carried out by (performed)

Scope note:
This property identifies the E39 Actor that received money for a specific service (Money for Service).

Examples:
- "Syrmas paying 50 pounds for policing" *money provided to "*the local policemen".

for employment (employment of)

Domain:
Money for Labour

Range:
Employment

Subproperty of:
for service (service of)

Scope note:
This property associates an instance of a payment with an instance of an employment that was used in order to specify rights and responsibilities between the "employee" and the "employer".

Examples:
- Total payroll of 1424 franc for labour was attributed *for employment* of Georgios Kondylis from 20/8/1913 to 3/12/1913.

for employment period (is employment period of)

Domain:
Money for Labour

Range:
E52 Time-Span

Scope note:
This property describes the total timespan (full employment period) of the Money for Labour activity and it is a shortcut of the most detailed path: *Money for Labour – for employment:*

Employment – P4 has timespan: E52 Time-Span (timespan of recruitment and discharge). The time-span can be also specified through a Duration instance, using the property had duration (duration of).

Examples:

- Total payroll of 1424 franc *for employment period* 3 months and 13 days (from 20/8/1913 to 3/12/1913).

has been agreed in (is agreement for)

Domain:

Money for Labour

Range:

Labour Contract

Scope note:

This property associates an instance of a money for labour with an instance of a Labour Contract document that is agreed and planned for this payment.

Examples:

- Monthly wage for Georgios Kondylis labour *has been agreed in* the Employment Contract created by the ship owner company Embeirikos.

for thing (thing of)

Domain:

Money for Things

Range:

E18 Physical Thing

Scope note:

This property describes a Money for Things activity that pays/receives money for physical things.

Examples:

- "Syrmas paying 53 francs" *for thing* "41 bars of soap".

for voyage (motivated payment)

Domain:

Crew Payment

Range:

Voyage

Subproperty of:

P17 was motivated by (motivated)

Scope note:

This property describes the voyage that sets the preconditions (motivates, determines, fixes) a crew payment. There is a dependency relationship between them; a new voyage sets the preconditions for a new crew payment activity.

Examples:

- A total wage of 12,095 francs was given *for voyage* of ship Constantinos from 9/3/1908 to 31/3/1908.

service provided by (provided service)

Domain:

Service

Range:

E39 Actor

Subproperty of:

P14 carried out by (performed)

Superproperty of:

employment provided by (provided employment)

Scope note:

This property describes the intention of an E39 Actor to provide a service. The property of property *in the role of* allows specifying the nature of an Actor's service provision.

Examples:

- "Policing (in order to prohibit the ship's crew from leaving the ship)" *service provided by* "the local policemen".

Properties:

in the role of: E55 Type

employment provided by (provided employment)

Domain:

Employment

Range:

E39 Actor

Subproperty of:

service provided by (provided service)

Scope note:

This property describes the employment service provided by an E39 Actor.

Examples:

- "Employment of M.Koutsoukos as a sailor on board in 1913" *employment provided b*y "M. Koutsoukos".

started (started by)

Domain:
Recruitment

Range:
Employment

Subproperty of:
P175 starts before or with the start of (starts after or with the start of)

Scope note:
This property describes an employment that was started by a recruitment activity.

Examples:
- Recruitment of M. Koutsoukos as a sailor in 10/9/1913 *started* the employment of M. Koutsoukos on board.

ended (ended by)

Domain:
Discharge

Range:
Employment

Subproperty of:
P184 ends before or with the end of (ends with or after the end of)

Scope note:
This property describes an employment that was ended/terminated by a discharge activity.

Examples:
- Discharge of M. Koutsoukos as a sailor in 30/10/1913 *ended* the employment of M. Koutsoukos on board.

Properties related to persons

has first name

Domain:
E21 Person

Range:
E62 String

Scope note:
This property associates an instance of E21 Person with an instance of E62 String used as the person's first name. This property is an alternative (more convenient) implementation of *P1 is identified by: E41 Appellation – P2 has type: "first name"; P190 has symbolic content: E62 String*.

The use of the *P1 is identified by: E41 Appellation* is required if there is the need to assign some additional properties to the first name, such as properties of use or attribution.

Examples:

- Anastasios Syrmas *has first name* "Anastasios".

has last name

Domain:

E21 Person

Range:

E62 String

Scope note:

This property associates an instance of E21 Person with an instance of E62 String used as the person's last name. This property is an alternative (more convenient) implementation of *P1 is identified by: E41 Appellation – P2 has type: "last name"; P190 has symbolic content: E62 String*.

The use of the *P1 is identified by: E41 Appellation* is required if there is the need to assign some additional properties to the last name, such as type, properties of use or attribution.

In some countries (e.g., Spain), each person has two last names. In such cases, the value assigned to E62 String can contain both last names, if a clear distinction is not required.

Examples:

- Anastasios Syrmas *has last name* "Syrmas".

works at (is working place of)

Domain:

E21 Person

Range:

E74 Group

Subproperty of:

P107i is current or former member of (has current or former member)

Scope note:

This property identifies the workplace, meaning the organisation/company in which a person works at. The *in the role of* property of the property allows specifying the nature, the role of an actor's work in the organisation/company.

Examples:

- Carlo Bellen *works at* Lloyd Austriaco.

Properties:

in the role of: E55 Type

has current age

Domain:
E21 Person

Range:
E60 Number

Scope note:
This property describes the current age of a person at a specific time (the time of the information recording).

Examples:
- C. Bellen *has current age* 30.

with ID (ID of)

Domain:
Civil Registration

Range:
E42 Identifier

Scope note:
This property records the identifier that was assigned to a person in a Civil Registration activity.

Examples:
- "Ibars's registration to the organisation of military service in 1911" *with ID* "1234".

registers person (person is registered by)

Domain:
Civil Registration

Range:
E21 Person

Scope note:
This property describes a person that is registered by a civil registration activity.

Examples
- "Ibars's registration to the organisation of military service in 1911" *registers person* "Jose Ibars".

concerned (was promoted by)

Domain:
Promotion

Range:
E21 Person

Subproperty of:

P140 assigned attribute to (was attributed by)

Scope note:

This property identifies the person that was promoted by a promotion activity.

Examples:

- "R. Morales promotion on 1902- 04-02" *concerned* "Ramon Morales".

promoted into status type (status type was promoted by)

Domain:

Promotion

Range:

Social Status

Subproperty of:

P141 assigned (was assigned by)

Scope note:

This property records the social status type that was promoted by a promotion activity. In that sense, we regard that a promotion can be related to a social status promotion or to a job/career promotion.

Examples:

- "J. Kabon's promotion on 1909-06-02" *promoted into status type* "commissioner".

promoted into employment position type (employment position type was promoted by)

Domain:

Promotion

Range:

Profession

Subproperty of:

P141 assigned (was assigned by)

Scope note:

This property records the employment (job) position type that was promoted by a promotion activity. In that sense, we regard that a promotion can be related to a social status promotion or to a job/career promotion.

Examples:

- "R. Morales' promotion on 1902- 04-02" *promoted into employment position type* "second engineer".

is given to (was punished by)

Domain:

Punishment

Range:

E39 Actor

Scope note:

This property associates a punishment to the actor that received the punishment.

Examples:

- "J. Campos' military penalty on 1907-02-02" *is given to* "Jose Campos".

has language capacity (is language capacity of)

Domain:

E21 Person

Range:

Language Capacity

Subproperty of:

P2 has type (is type of)

Scope note:

This property describes concepts that represent language capacity/knowledge that characterizes a E21 Person at a specific time period that is maybe unknown.

Examples:

- Федор Наркевич *has language capacity* Russian.

has literacy status (is literacy status of)

Domain:

E21 Person

Range:

Literacy Status

Subproperty of:

P2 has type (is type of)

Scope note:

This property describes the literacy status of a person at a specific time period that is maybe unknown.

Examples:

- Федор Наркевич *has literacy status* literate.

has social status (is social status of)

Domain:

E21 Person

Range:

Social Status

Subproperty of:

P2 has type (is type of)

Scope note:

This property identifies the social status of a person at a specific time period that is maybe unknown.

Examples:

- Федор Наркевич *has social status* married.

has sex type (is sex type of)

Domain:

E21 Person

Range:

Sex Type

Subproperty of:

P2 has type (is type of)

Scope note:

This property associates a person with the sex type that this person has at a specific time period that is maybe unknown.

Examples:

- Anastasios Syrmas *has sex type* male.

has profession (profession of)

Domain:

E21 Person

Range:

Profession

Subproperty of:

P2 has type (is type of)

Scope note:

This property associates a person with the profession, job or career that has been practicing at a specific time period that is maybe unknown.

The evolution in the career/profession of a person is an important historical question; it implies the person development and evolution (microhistory) and consequently the population evolution (macrohistory).

Examples:

- Anastasios Syrmas *has profession* captain 1st class.

has religion status (is religion status of)

Domain:

E21 Person

Range:

Religion Status

Subproperty of:

P2 has type (is type of)

Scope note:

This property describes the religion status of a person at a specific time period that is maybe unknown.

Examples:

- Giulio Britz *has religion status* catholic.

related to

Domain:

E21 Person

Range:

E21 Person

Scope note:

This property describes the existence of a relation between persons, without the need to also specify the kind of relation. It is used in cases in which the types of the possible relationships between persons are many and not defined by the model, or in cases in which there is lack of knowledge about the kind of the relationships and there is only a requirement to mark just the existence of a link between persons.

The property of property *has type: E55 Type* can be used to specify the type of relation, e.g., by linking to a vocabulary or thesaurus.

Examples:

- Jose Antonio *related to* Manolo Klaus (kind of relation: teacher).
- Antonia Brugarolas *related to* Jose Grau (kind of relation: spouse).

Properties:

has type: E55 Type

Properties related to teaching activities

has subject (is subject of)

Domain:
Teaching Unit

Range:
Subject

Subproperty of:
P2 has type (is type of)

Scope note:
This property describes the subject of a teaching unit.

Examples:
- Sezione commerciale *has subject* Aritmetica mercantile.

with number of students

Domain:
Teaching Unit

Range:
E60 Number

Scope note:
This property describes the number of the students participating in a teaching unit.

Examples:
- Sezione commerciale 1° corso *with number of students* 41.

had student (student in)

Domain:
Teaching Unit

Range:
E39 Actor

Subproperty of:
P11 had participant (participated in)

Scope note:
This property associates instances of E39 Actor with the instances of Teaching Unit in which they participated in the role of students.

The property of the property *status of participation* allows specifying the nature of an Actor's participation in a course/teaching unit. For example, it can be the student's exam status or paying/scholarship status in a course.

Examples:

- Sezione commerciale 1° corso *had student* Alfieri Barison.

Properties:

with status of participation: E55 Type

References

Bennett, M., 2013. The financial industry business ontology: Best practice for big data. *Journal of Banking Regulation*, *14*(3), pp.255-268. https://doi.org/10.1057/jbr.2013.13

Delis, A. 2012. Mediterranean Wooden Shipbuilding in the nineteenth century: Production, Productivity and Ship Types in Comparative Perspective , Cahiers de la Méditerranée, 84 | 2012, 349-366. https://doi.org/10.4000/cdlm.6544

Delis, A., 2020. Seafaring Lives at the crossroads of Mediterranean maritime history. *International Journal of Maritime History*, *32*(2), pp.464-478. https://doi.org/10.1177/0843871420924240

Doerr, M., 2003. The CIDOC conceptual reference module: an ontological approach to semantic interoperability of metadata. *AI magazine*, *24*(3), pp.75-75. https://doi.org/10.1609/aimag.v24i3.1720

Doerr, M., 2005. The CIDOC CRM, an ontological approach to schema heterogeneity. In *Dagstuhl Seminar Proceedings*. Schloss Dagstuhl-Leibniz-Zentrum für Informatik. https://drops.dagstuhl.de/opus/volltexte/2005/35/

Doerr, M., & Kritsotaki, A. 2006. Documenting events in metadata. *Proceedings of VAST 2006: The 7th International Symposium on Virtual Reality, Archaeology and Cultural Heritage*. Short papers from the joint event CIPA/VAST/EG/EuroMed2006, Nicosia, Cyprus, 30 October - 4 November 2006 (pp. 56-60). https://cidoc-crm.org/sites/default/files/Documenting%20Events%20in%20Metadata.pdf

Doerr, M., Ore, C.E. and Stead, S., 2007, November. The CIDOC conceptual reference model: a new standard for knowledge sharing. In *Tutorials, posters, panels and industrial contributions at the 26th international conference on Conceptual modeling-Volume 83* (pp. 51-56). https://dl.acm.org/doi/abs/10.5555/1386957.1386963

Fafalios, P., Petrakis, K., Samaritakis, G., Doerr, K., Kritsotaki, A., Tzitzikas, Y. and Doerr, M., 2021. FAST CAT: Collaborative Data Entry and Curation for Semantic Interoperability in Digital Humanities. *Journal on Computing and Cultural Heritage*, Volume 14, Issue 4, Article No 45. https://doi.org/10.1145/3461460

Jaworski, W., 2008, August. Contents modelling of Neo-Sumerian Ur III economic text corpus. In *Proceedings of the 22nd International Conference on Computational Linguistics (Coling 2008)* (pp. 369-376). https://aclanthology.org/C08-1047.pdf

Meghini, C., Doerr, M. and Spyratos, N., 2009, July. Managing Co-reference Knowledge for Data Integration. In *Proceedings of the 2009 conference on Information Modelling and Knowledge Bases XX* (pp. 224-244). https://dl.acm.org/doi/abs/10.5555/1565714.1565730

Petrakis, K., Samaritakis, G., Kalesios, T., i Domingo, E.G., Delis, A., Tzitzikas, Y., Doerr, M. and Fafalios, P., 2020. Digitizing, Curating and Visualizing Archival Sources of Maritime History: the case of ship logbooks of the nineteenth and twentieth centuries. *Drassana: revista del Museu Marítim*, (28), pp.60-87. https://doi.org/10.51829/Drassana.28.649

Harlaftis, G. and Kostelenos, G., 2012. International shipping and national economic growth: shipping earnings and the Greek economy in the nineteenth century 1. *The Economic History Review*, *65*(4), pp.1403-1427. https://doi.org/10.1111/j.1468-0289.2011.00628.x

Ruth, J., 1997. Encoded Archival description: A structural overview. *The American Archivist*, *60*(3), pp.310-329. https://doi.org/10.17723/aarc.60.3.g121j46347828122