WP4: eMAR Administration Applications Interfacing with SSN

Directorate-General for Mobility and Transport

EUROPEAN COMMISSION

University of Piraeus

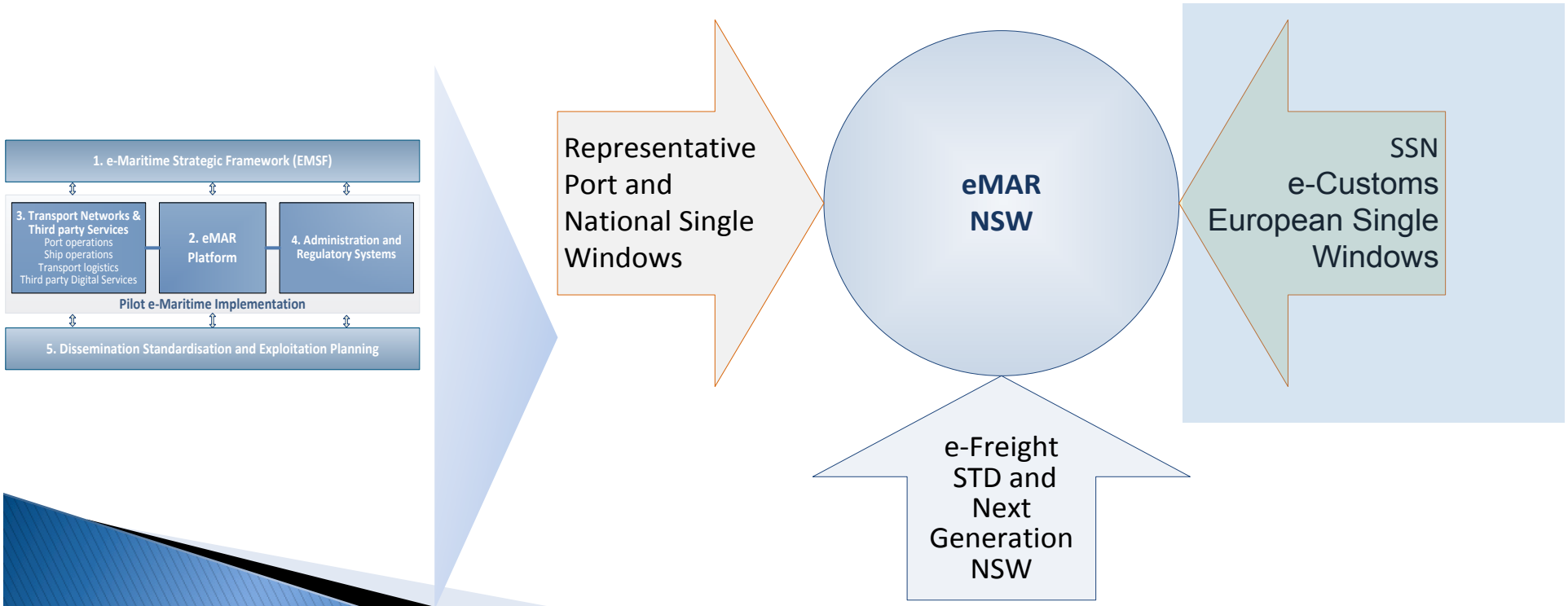
Presentation Mission

- Objectives of this Presentation
- Review of Task 4.1
- Presentation of T4.1 Objectives
- Timeline
- Outputs

Task 4.1addresses eMar capabilities of SSN

T4.1 Interfacing with SSN and related developments (m24, m33)

- As per the DoW, *"[…]This task will investigate e-Maritime related capabilities relating to the European Index Server (EIS) core and EIS web-services, STIRES services, Voyage plan service, AIS /LRIT repository etc.. The output will be a library of SSN related e-Maritime services and policy, standardisation and research recommendations […]"*



Key Drivers of T4.1 engagement

- Recent developments in:
  - semantically enhanced SOAs and surveillance/sensor technologies
  - Situational awareness services
- Future versions of SSN (new notifications / messages, interoperability with the NGNSW)
- Different national approaches, SSN, e-Customs and Single Window developments, as well as ongoing research project outputs (i.e. e-FREIGHT)
  - Different national approaches as exemplified by the Finnish system (all ports integrated with SSN and customs);
- SSN developments particularly relating to proxy applications addressing both data requesting and data provision and a common interface for e-Notifications;
- Developments of the e-Customs Single Window;
- Research outputs from Next Generation NSW in Latvia (e-Freight project)

SSN evolution and developments to affect T4.1 engagement (I/II)

- Expected evolution of SSN (until 2015) includes a number of developments that impact future e-Maritime SSN enabled composite applications:
  - Transition of the European Index Server (EIS) architecture into a SOA based approach (to be used for the exchange of the new PortPlus and ShipCall messages)
  - Combination/ fusion of position data originated from AIS, LRIT, VMS and SAR images in SSN GIS interface
  - Integrated distribution of LRIT/ AIS information via SSN
  - Integration of SSN and CleanSeanet functionality to facilitate pollution incidents analysis and identification of potential polluters
  - Visualization of ship inspection information (collected and processed by THETIS) on the SSN GIS interface
  - SSN access mechanism improvement.

SSN evolution and developments to affect T4.1 engagement (II/II)

- Port Notification (24 hours pre-Arrival
- notifications),
- Ship Notification (refer also below),
- Hazmat Notification
- Incident Notifications (pollution, containers lost/ found, waste, etc).
- 3 days pre-arrival notifications
- Security notifications
- All these will become available 72h

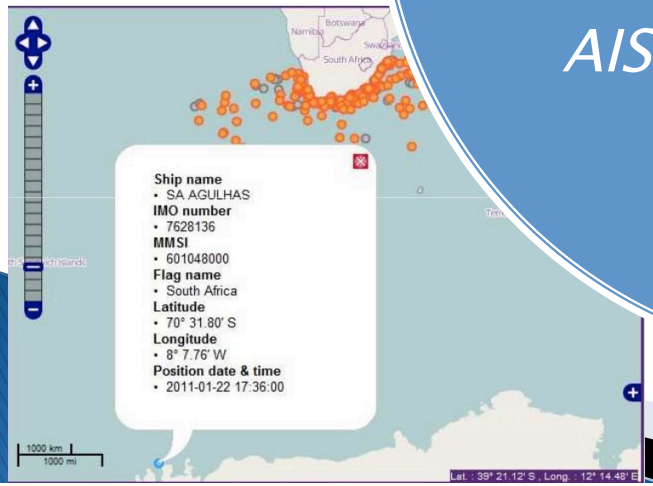
- Web services to improve visuals
- Web services to improve connectivity

European Index Server (EIS) core

EIS web-services

AIS /LRIT

STIRES services



- Tracking vessel movements in near real time (AIS data collected up to every 6 minutes)
- Operational information on ship voyages based on information stored in SSN EIS
- EMSA Geodatabase system
- CleanSeaNet Service
- *Voyage plan service*

So, what is T4.1 engagement all about?

Key Activities List

- A comparison of the evolving SSN platform and the MARNIS concept
- Review and analysis of the SSN business logic and architecture in light of the eMAR services requirements.
- Mapping of e-MAR services requirements into functional requirements affecting SSN further evolution and identification of important interdependencies.
- Review of the SSNv2 design (in the release available at the time of the initiation of the respective activity) to specify eMAR functionality and interfaces requirements regarding the European Index Server (EIS) core and EIS web-services, STIRES services, Voyage plan service, AIS /LRIT repository etc.
- Development of design requirements (applicable rules, elements and attributes definitions) to be applied to eMAR – SSN XML reference models compatibility
- A (Few) proposals for amendment of existing messages (e.g. PortPlus, ShipCall) and potential for new messages
- Identification of needs for linking SSN reference databases to external databases and ways of sharing information, as stemming from eMAR services requirements with particular reference to the Safety Security Environmental Systems

This in “”layman’s” terms is:

Presentation Layer

Supervising Controller	
User Interface processing is divided into three separate roles.	The three roles are Model, View, and Presenter. The Model represents data, the View represents the user interface, and the Presenter is responsible for processing requests.
The web page handles requests and passes them off to a controller	Requests are sent to the View (web page), which then passes control to a provider that is responsible for initializing the Model, returning control back to the View, or passing control on to a different View.
M-V-P do not depend directly on each other (Dependency inversion)	M-V-P do not depend directly on each other. Instead, they depend on interfaces (e.g. IView, IPresenter)
Template View	
An ASP.NET Master page is used to provide a common look and feel.	Common elements such as background, page layout, menus, header, and footer are defined in the master page.
ASP.NET pages focus on content that is specific to each page	Each page is associated with the master page, which renders the common content. As a result, the page only needs to contain user interface elements that are not common across all pages.
Bound Data Control	
ASP.NET Server and User controls are bound to business entities returned from the business layer.	Business entities returned from the business layer can be bound to web controls, which will use data from the entity when rendering the display.

Business Layer

Domain Model	
The domain model is comprised of POCOs (Plain Old CLR Objects)	The Domain Model consists of POCOs that are related and fully describe the application domain. POCOs are "…ordinary classes where you focus on the business problem at hand without adding stuff for infrastructure-related reasons…. The classes should focus on the business problem at hand. Nothing else should be in the classes in the Domain Model." (1)
POCOs also contain domain logic.	The POCOs also have methods that implement the business logic.
The POCOs are completely Persistence Ignorant (PI)	This allows us to : • Design the Domain Model independently from the Database Model. • Design, build, and test any business logic relatively independently of the database and the persistence infrastructure code.
Unit Of Work	
The Unit of Work keeps track of changes during a business operation, and saves the changes to the database.	When you're pulling data in and out of a database, it's important to keep track of what you've change. Similarly you have to insert new objects you create and remove any objects you delete. You can change the database with each change to your object model, but this can lead to lots of very small database calls, which ends up being very slow. Furthermore it requires you to have a transaction open for the whole interaction, which is impractical if you have a business transaction that spans multiple requests. The situation is even worse if you need to keep track of the objects you've read so you can avoid inconsistent reads. A Unit of Work keeps track of everything you do during a business transaction that can affect the database. When you're done, it figures out everything that needs to be done to alter the database as a result of your work.
Used for business operations that need to be executed as a single unit.	Within the Unit of work operation all changes a tracked, one or more business operations are performed, and the changes are only propagated to the database depending on the outcome of the business operations.
Can also be used to manage context information.	This pattern can be used to implement a single point of entry for each request where context can be initialized and used throughout the request processing.
Functional Decomposition	
Business Processes are implemented using the Functional Decomposition pattern. Each process is broken down to sub-processes and modeled using IDEF0 models.	A function is achieved by a sequence of sub-functions. A combination of a super-function and its sub-functions is called a functional decomposition pattern. Its definition consists of a super-function, sub-functions, functional relations among sub-functions, and behavioral conditions. These functions are described in terms of the functional concepts. For example, a super-function "heat object" has two sub-functions; "generate heat" and "give heat". There should be a proportional-type functional relation among them. The behavioral condition is that the objects receiving the heat are identical. In general, a function has some functional decomposition patterns to achieve it. A super-function is decomposed into sub-functions by specifying something related to the ways to achieve it. (In the task context of the functional hierarchy understanding, the reverse operation of the functional decomposition, the information is lost.) According to what is specified, we can categorize the functional decomposition patterns as follows (the notation of the examples in the list is that super-function → sub-function + sub-function2, if any):

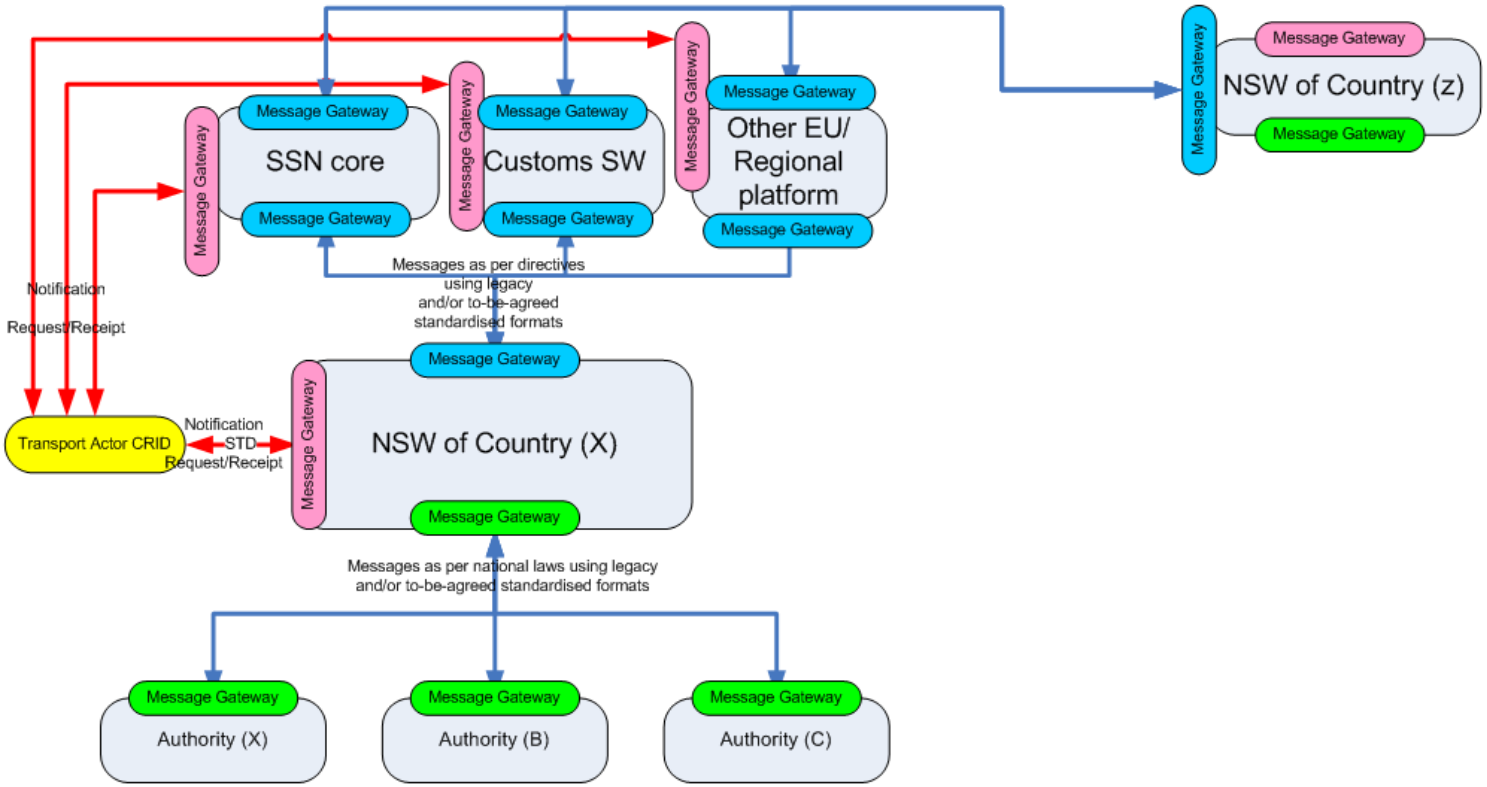
Data Access Layer

```
protected override void OnInit(EventArgs e)
{
    base.OnInit(e);
    presenter = new CustomerPresenter(this, new CustomerController());
}

protected override void OnLoad(EventArgs e)
{
    base.OnLoad(e);
    action = GetFormArgument("action");
    requestedEditCustomerCustomerID = Request.QueryString["ID"];
    if(!IsPostBack)
    {
        presenter.OnViewInitialized();
    }
    presenter.OnViewLoaded();
}
```

Looking for the best fit for eMAR

Conceptual design of NSW/SSN model



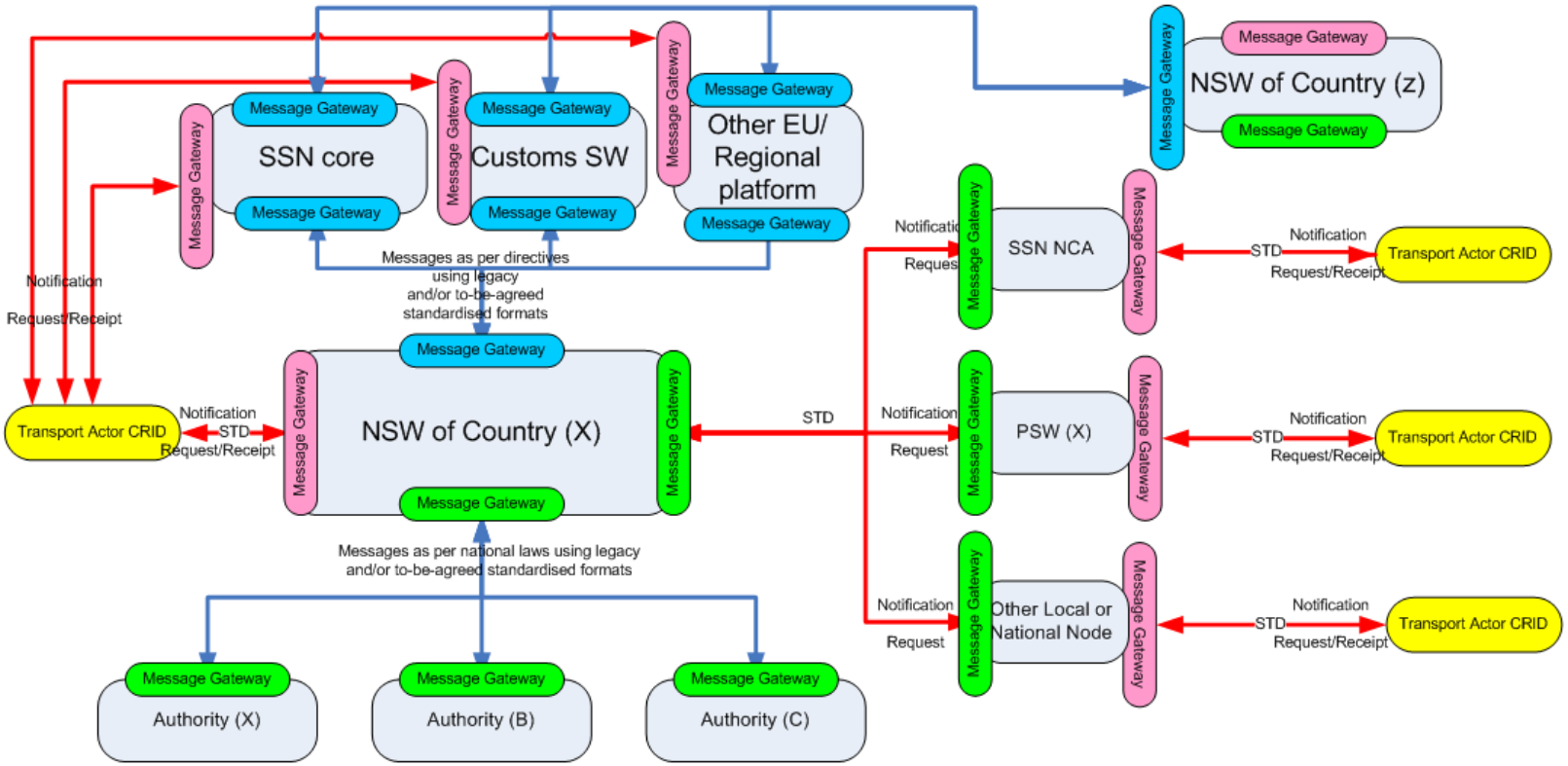
Principles:

1. A single reporting entry point for B2A transactions for each transport business actor
2. A single coordination mechanism per country for processing / dissemination of the data submitted by shipping industry
3. A2A functions added as per the evolving legislative framework – Architecture open to encompass new standardised formats but back-wards compatible with existing legacy mechanisms

Legend:

1. A yellow background components of the Transport actor CRID — CRID
2. A blue components of the EU A2A Reporting interface — EU_RI
3. In Green components of the A2A reporting inteface at national level — MS_RI
4. In magenta components of the B2A Common reporting interface — CRI

Conceptual design of NSW/SSN model including mode specific SWs



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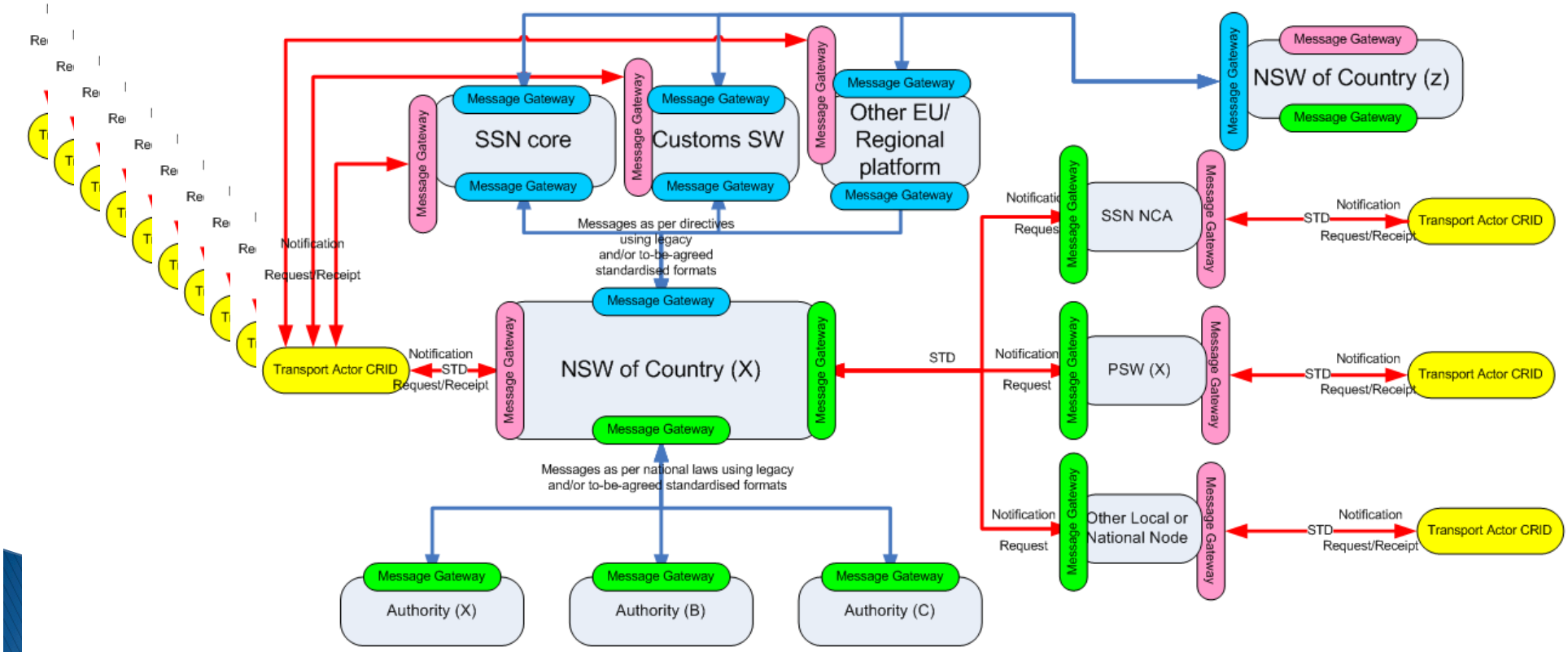
Now, let's add real life complexity!



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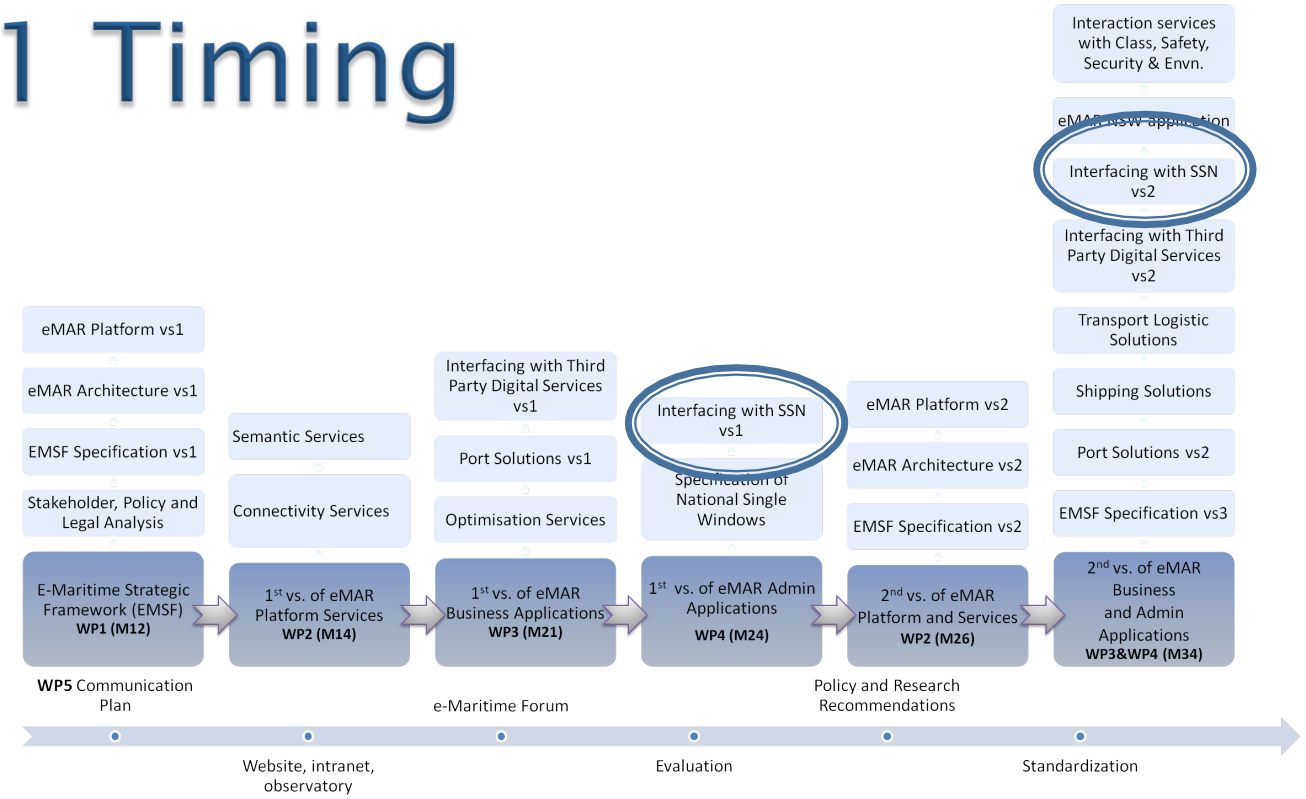
T4.1 Timing



	Tasks in Work Packages	Lead	person-months	%	Months 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36	Start-End (month)	
WP4	**eMAR Administration Applications**	3	50.2	13%	M6	**11**	**33**
T4.1	Interfacing with SSN and related developments	25	12.8		V1 V2	11	33
T4.2	eMAR NSW	14	22.6		V1 V2	11	33
T4.3	Interfacing with Class, Safety, Security & Environmental Systems	3	14.8		V1 V2	11	33

Outputs & KPIs

- D4.2: Interfacing e-Maritime with SSN and related developments v1 which is an analysis of e-Maritime capabilities relating to the European Index Server (EIS) core and EIS web-services, STIRES services, Voyage plan service and AIS /LRIT repository
  - Mapping of e-Maritime services into functional requirements affecting further evolution of SSN
  - Prototype solution linking SSN reference databases to external databases
  - Demonstrate ways of sharing information, as stemming from eMAR services requirements with particular reference to the Safety Security Environmental System [month 24]
- D4.3 Interfacing e-Maritime with SSN and related developments v2, a library of SSN related e-Maritime services and policy, standardisation and research recommendations[M33] :
  - Registry with SSN related e-Maritime services;
  - Recommendations on related Policy, Standardisation and Research
  - Guide for the selection and integration of SSN related e-Maritime services

However….

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Your help to produce business oriented products is important!

Thank you for your attention

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