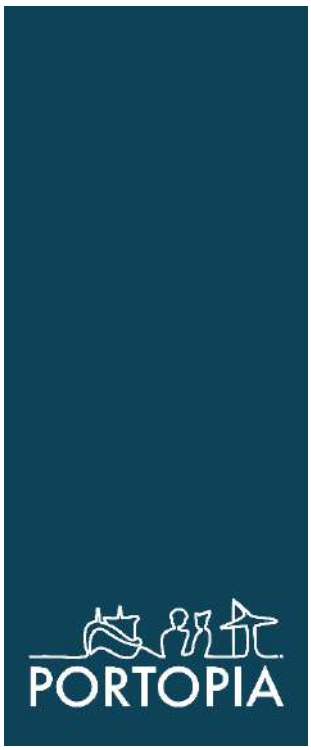

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Interim User interface for data collection

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1 INTRODUCTION

This document presents a summary of the contributions and challenges that were addressed by the project team that is responsible for the Portopia ICT. In a brief overview it is presented what has been accomplished, in line with what is defined in the Description of Work (DoW) and what has been achieved beyond the DoW, over the course of the first six months of the project.

2 SHORT-TERM STATUS (LAST SIX MONTHS)

What we have done from September 2013 until today?

Over the last six months a significant resources investment was made - beyond what was initially estimated - which aimed at creating, as soon as possible, a shared vision on the added value that investment in ICT could give to the Portopia project and what role these tools can contribute to the competitiveness of the European ports.

We can affirm that, over the course of the last six months, we went beyond what is mentioned in the Description of Work (DoW). However, we consider this additional contribution as a risk anticipation strategy, fundamental to the overall success of the project.

The following table provides an overview of the work that was developed in the last six months, reflecting the contribution of ICT investment within the project. Each of the contributions presented here, as well as the challenges that we had to overcome, will be described in next chapters.

CONTRIBUTION	STATUS	DOW
System architecture	30%	YES
Digital media support	75%	NO
Branding and consortium templates design	50%	NO
Collaborative platform	50%	NO
PPRISM: Interim User Interface for Data Collection	100%	YES
ECOPORTS: Interim User Interface for Data Collection	N/A	YES
RES: Interim User Interface for Data Collection	100%	YES
FACTS FINDING: Interim User Interface for Data Collection	100%	YES
CEF: Interim User Interface for Data Collection	100%	NO
PPRISM: Standardised Web services for system to system interoperability	100%	NO
ECOPORTS: Standardised Web services for system to system interoperability	25%	NO
RES: Standardised Web services for system to system interoperability	100%	NO
CEF: Standardised Web services for system to system interoperability	100%	NO
Data Analysis Module [Data warehouse demonstrator]	50%	NO
PPRISM: Dashboards [Mochup with prospective of the system]	50%	NO
RES: Dashboards [Mochup with prospective of the system]	25%	NO
Port Profile [Mochup combining different data sources]	25%	NO
Users Perspective Support Survey (WP06)	100%	NO

Table 1 ICT Contributes in the first six months

2.1 System architecture

The progress over the definition of the System Architecture is presented in more detailed in a specific document - Architecture Design Specification (ADS).

System architecture defines *how* the system/product will be constructed, describing what the critical components are and how they fit together, from a high-level, logical perspective. It does not provide the details of the design – that comes later. The architecture is documented in a way that clearly states the identification of the logical layers of ***Portopia Service Cloud***, the specific subsystems that compose the layers, and their responsibilities and interfaces.

The technological philosophy behind ***Portopia Service Cloud*** is to provide the technological state-of-art in terms of data analysis based in open source initiative. This strategy aims to demonstrate that the open source and the cloud systems could improve the efficiency of the european ports and reduce ICT costs.

More detailed information could be found in document identified as: **PORTOPIA|D|11.1.1|DT|2014.02.26|V|01 – System Architecture**

2.2 Digital media support

In order to support the dissemination activities carried out by the consortium, and in order to align the communication strategy with current Web 2.0 trends and potential, in particular with social networks dissemination, several supports were developed, namely:

2.2.1 Website

Since the end of the first project month the website of Portopia is available at www.portopia.eu.

The technology used on the development of this website contemplates a technological advanced platform, over which, users without advance IT knowledge may manage contents and access to private information. The website was built over a strategy which will allow to create a relevant starting point to what will be the Knowledge Management System (KMS), to be developed later on the project.

Currently, the website provides relevant information about the project, news, blog, newsletter subscriptions, and other relevant features to allow a good link between the project and the community to whom it is intended.

Finally, the website has been optimized so that its contents are easily found in different search engines (SEO).

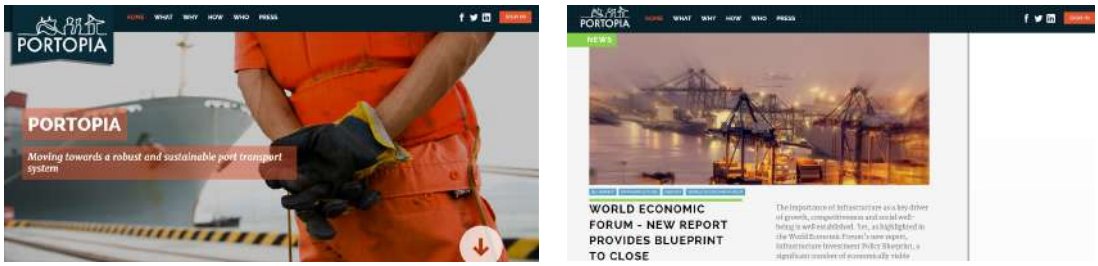

Figure 1 Portopia Website

2.2.2 Social Networks

In order to take the upmost advantage of the social networks potential, we constructed accounts and implemented pages with the design of the project on the following social networks: LinkedIn, Facebook, Twitter, YouTube.

The social networks and website are fully integrated, allowing all the published contents to be largely disseminated through the web.

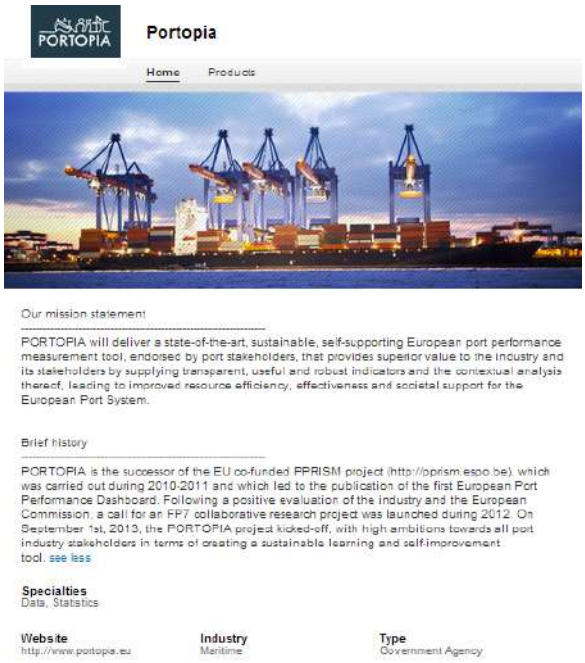

Figure 2 Portopia Linkedin Group

2.3 Branding and consortium templates design

The branding and communication have a large impact in the materialization of concepts and are powerful tools, particularly when projects require the prior acceptance from the relevant stakeholders.

In this context, a significant investment was made on branding and communication, the graphic standards were produced, document templates, user interface strategies and experience, that aim at stimulating the end users curiosity.

2.4 Collaborative platform

Group communication and collaboration are key to every aspect of education and research. This contribution is delayed and cannot be used within the Consortium due infrastructure and information security issues that remain to be solved by the technical team.

The idea of having a communication and collaboration aims to improve consortium communication and project management control with the following tools:

- Shared document creation – like Google Docs
- Cloud storage – like Dropbox
- Wikis and blogs – like WordPress and Twitter
- Video and voice communication – such as Skype and Big Blue Button
- Calendaring and surveys – like Doodle
- Data banks and virtual research environments – like Sakai

2.5 Interim User Interface for Data Collection

Figure 3 Portopia Service Cloud Concept

The development of the User Interface (UI) concept for the Portopia project raised two distinct challenges. The first challenge relates to the need to bring to the project the user experience and usability techniques state-of-the-art, recognized by the newer standards applied to web technologies. The second, the user interface by itself is not sufficient. It was necessary to develop a scalable information architecture, able to accommodate data and metadata in order to avoid duplication and loss of data series.

Within this context, it should be noted that significant efforts were made in order to harmonize the content from the different data sources. This was probably the most complex challenge carried out within the project, since it was necessary to find conversion standards and models in order to harmonize the different data types. For example, of the different data sources that were integrated in recent months, none had a common and unique identifier to the port, thus making it impossible to match data from different data sources for the same port.

To this end, it was adopted the UN/LOCODE model in order to identify the port and were implemented translation algorithms that allows the conversion of the data received from different sources into a format that is capable of allowing the integration into a single model.

2.5.1 PPRISM

Significant steps were given in order to eliminate the burdensome methodology of data collection using MS Excel sheets, providing a modern and easy to use web interface. Additionally, the data collection model has been improved, in order to allow collecting data for different indicators by identifying the time series to which they relate. Thus, it will be possible to ask the ports to provide data so that the study is performed considering the evolution, and not only present situation.

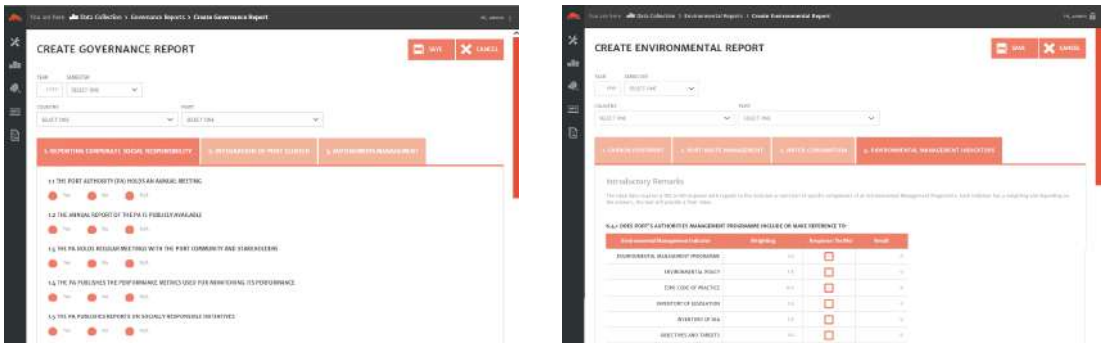

Figure 4 PPRISM User Interface

2.5.2 ECOPORTS

It made no sense to develop a user interface for the integration of the ECOPORTS data. A standardized format for the Data Exchange was defined and agreed between the different stakeholders. The data exchange between systems is made by file import and export.

It should be noted that, in this particular case, a significant effort from both project teams was made in order to guarantee the feasibility of the data exchange process. From the ECOPORTS side, efforts to adapt to the agreed format were made and, from the Portopia side, different translators were developed in order to allow incoming data to be analysed and integrated with other data sources.

There is still some work to be done, particularly related to the data quality. However, this fact will not endanger the achievement objectives of the Portopia project objectives.

2.5.3 RES

The integration with the Rapid Exchange System has brought forward several challenges related to, once again, matching the different data types and, additionally, several limitations were found in how the data series were organized in different quarters. Several data conversion algorithms had to be developed and some heuristics have been applied in order to allow multidimensional analysis to be performed over the Rapid Exchange System data.

It should be mentioned that the current system allows ports to perform advance analysis and establish benchmarking scenarios using their data.

In a perspective of stimulating the future of Portopia Service Cloud platform to act as a single window for ports reporting tasks with other entities, one user interface was developed to allow the data collection from the Rapid Exchange System. The objective is to allow the data collection to be performed in an integrated way from the electronic Portopia platform, enabling ports to make real-time analysis based on their own results against the results of their peers.

2.5.4 FACTS FINDING STUDY

The integration of the gathered information through the Facts Finding initiative was done through direct file processing. Once again, the main challenges were related with the need to develop pre-processing data algorithms in order to allow their integration with other data sources.

2.5.5 CEF

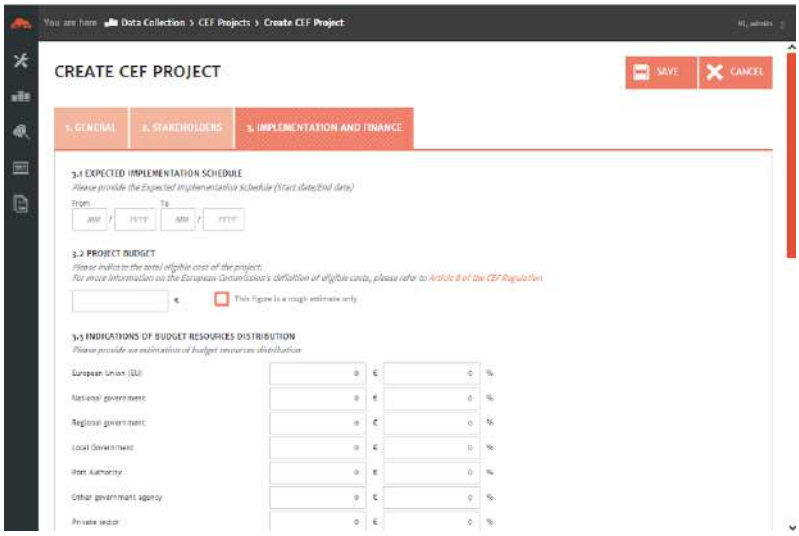

Figure 5 CEF User Interface

More detailed information could be founded in the following documents: PORTOPIA_D11_1_03DT-InterimUserInterface-280214.pptx

2.6 Standardised Web services for system to system interoperability

Web services are software components that communicate using pervasive, standards-based Web technologies including HTTP and XML-based messaging. Web services are designed to be accessed by other applications and vary in complexity from simple operations, such as checking a banking account balance online, to complex processes running CRM (customer relationship management) or enterprise resource planning (ERP) systems. Since they are based on open standards such as HTTP and XML-based protocols including SOAP and WSDL, Web services are hardware, programming language, and operating system independent. This means that applications written in different programming languages and running on different platforms can seamlessly exchange data over intranets or the Internet using Web services.

Web services are powered by XML and three other core technologies: WSDL, SOAP, and UDDI. Before building a Web service, its developers create its definition in the form of a WSDL document that describes the service's location on the Web and the functionality the service provides. Information about the service may then be entered in a UDDI registry, which allows Web service consumers to search for and locate the services they need. This step is optional but is beneficial when a company wants its Web services to be discovered by internal and/or external service consumers. Based on information in the UDDI registry, the Web services client developer uses instructions in the WSDL to construct SOAP messages for exchanging data with the service over HTTP.

Web services: Benefits

Web services provide several technological and business benefits, a few of which include:

- Application and data integration
- Versatility
- Code re-use
- Cost savings

The inherent interoperability that comes with using vendor, platform, and language independent XML technologies and the ubiquitous HTTP as a transport mean that any application can communicate with any other application using Web services. The client only requires the WSDL definition to effectively exchange data with the service – and neither part needs to know how the other is implemented or in what format its underlying data is stored. These benefits allow organizations to integrate disparate applications and data formats with relative ease.

Web services are also versatile by design. They can be accessed by humans via a Web-based client interface, or they can be accessed by other applications and other Web services. A client can even combine data from multiple Web services to, for instance, present a user with an application to update ship movements, cargo, and ERP systems from one unified interface – even if the systems themselves are incompatible. Because the systems exchange information via Web services, a change to the one database, for example, will not affect the service itself.

Portopia Service Cloud is a cloud software developed under a service oriented architecture (SOA). This allows the data exchange between Portopia and ports without the need of human intervention. Data can be collected from system to system approach and reduce the number of bureaucratic reporting tasks. Currently, the system provides standardized web services to integrate the following project requests: PPRISM, ECOPORTS, RES and CEF.

More detailed information could be found in document identified as: **PORTOPIA|D|11.1.3|DT|2014.02.26|V|01 – Interim User Interface – From Data Collection to Data Analysis.**

2.7 Data Analysis

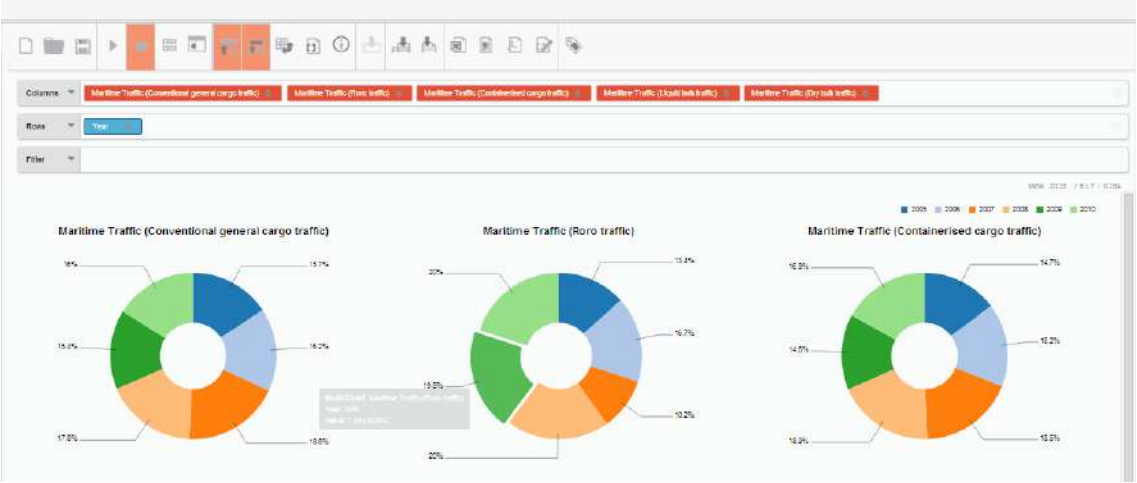

Figure 6 Maritime Traffic Analysis

After the development of an operational data model, to enable the integration of different data sources, a data warehouse prototype was developed that aims to anticipate the inherent risks, given the complexity of the upcoming deliverables (planned for the final part of the project). Furthermore, it also allows the identification of vulnerabilities in the developed data models or in the calculation formulas. Additionally, this type of advanced analysis leads to extreme demands on the pre-processing methods and on data harmonization, which, in the context of this project given the absence of patterns on the different data sources, has been a major challenge.

Were developed different OLAP cubes that allows multidimensional analysis to be performed, with the data from the following projects: PPRISM, ECOPORTS, RES, FACTS FINDING and CEF (Investment Needs Study).

The Work Package 11 leader, believes that an early prototyping of this deliverable can be an added value tool, and allows the port community end users to recognize the collaboration value and enthusiasm that exists towards the success of Portopia.

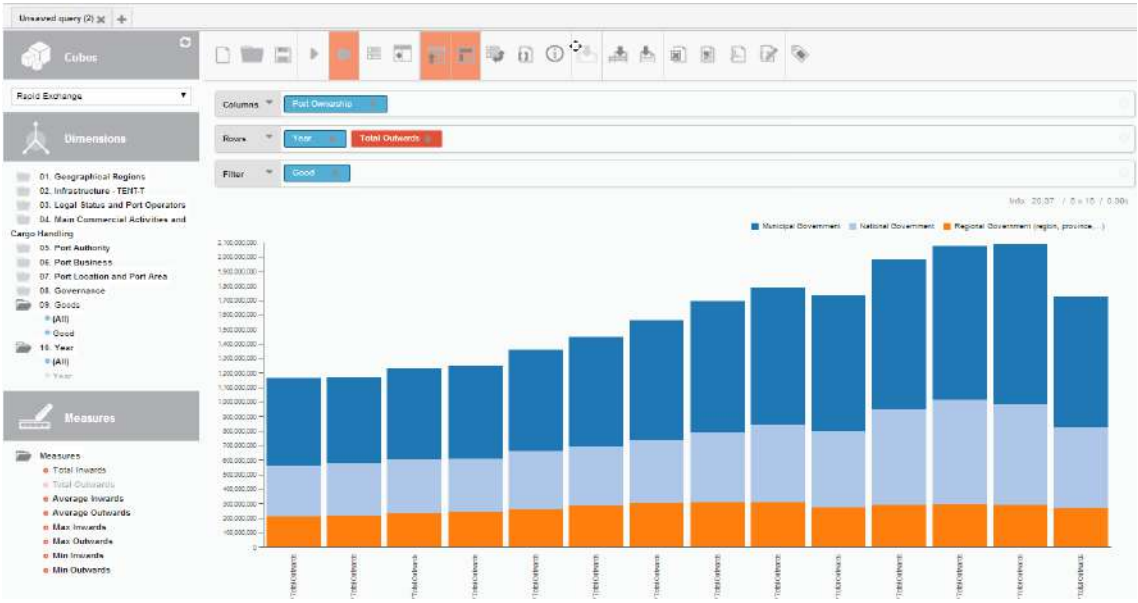

Figure 7 Movements of cargo according with Port Ownership

More detailed information could be found in document identified as: **PORTOPIA|D|11.1.4|DT|2014.02.26|V|01 – Portopia Service Cloud – Data Warehouse Prototype.**

2.8 Dashboards & Port Profile

At the time of preparing this document the team was working on a prospective vision around the dashboard concepts to be implemented in the project.

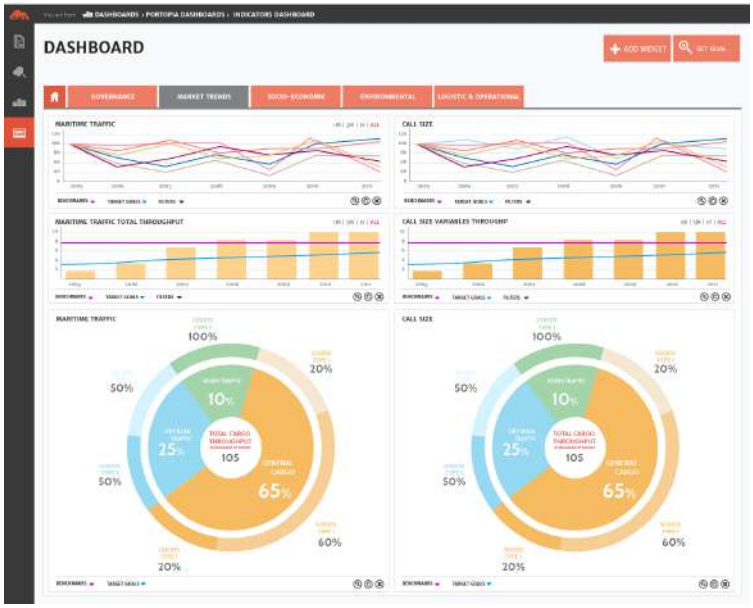

Figure 8 Market Trends & Structure Dashboard Concept

More detailed information could be found in document identified as: **PORTOPIA|D|11.1.5|DT|2014.02.26|V|01 – PPRISM'S OUTPUT UNDER PORTOPIA'S SERVICE CLOUD - *The dashboard concept for European ports***

3 SHORT-TERM STATUS (NEXT SIX MONTHS)

Despite the considerable progress that has been made in the past six months, a deeper knowledge of current data sources was raised as a top priority in the development of a scalable and moldable information architecture that allows accommodating changes in the port's data modeling, without impact on the existing data structures. This need must precede deeper developments, both in terms of indicators implementation and in terms of analytical models advocated for the information architecture of a data warehouse. This is a challenge that must be immediately addressed, taking into account the adoption of standards and design patterns that will allow an easy articulation with data sources such as Eurostat, OECD and World Bank.

It should also be noted that unfavorable decisions and design errors are likely to have implications, both in time and costs of deploying analytical models foreseen in the data warehouse.

Over the past six months several technology based tasks were developed, aimed at creating the foundations of the Portopia Service Cloud tool. At the time of this report, validation tasks were yet to be performed with end-users of the industry. Several types of prototypes were developed aiming at gather feedback over the next two months. This validation will require the successful completion of a very ambitious goal, which is the implementation of a Dashboard demonstrator, to be presented in May at the ESPO annual conference, held in Gothenburg for the 2014 edition.

Finally, in the next six months are planned several joint initiatives with academic partners, of which requirements will be collected, in order to "feed" future developments of the Portopia Service Cloud platform.

4 MODIFICATIONS IN THE APPROACH PRESENTED IN THE DOW

Effectively, the only changes that we had in the DoW were related to the delivery of contributions that were not originally anticipated that, as explained earlier, aimed at fulfilling two different purposes: one regarding the risk anticipation, and the other, related to the need of develop strategies aimed at stimulating interest and contributions from the end-users about the Portopia Service Cloud potential.

5 METHODOLOGICAL/PROCESS ISSUES ENCOUNTERED AND SOLUTIONS APPLIED

As previously mentioned, several data integration problems were identified in the Rapid Exchange System and ECOPORTS. Some of these problems are inherent to the different methodological approaches taken by the different projects, which, in a data integration perspective, raise several compatibility issues. Thus, one of the challenges was the development of support algorithms to the data pre-processing processes, aiming at harmonizing the formats and data types.

It should be noted that, in the context of the Rapid Exchange System data integration, the current data collection methodology, based on MS Excel sheets, is quite tolerant to user errors, raising questions about the data reliability as a result of human errors. These difficulties are particularly felt in relation to aggregation of the results by quarters. As we were not being able to define heuristics that would translate the data from source to destination in a reliable way, it was chosen not to integrate data aggregated from different quarters of each reported year, and to solely integrate the aggregate data for each year. We believe that changing the current data collection approach can solve this problem: we propose that the MS Excel sheets approach should be set aside, and, similarly to what we did with PPRISM and CEF, a user interface should be provided to facilitate the process of data sharing, reducing the likelihood of data entry errors due to human action.

6 DELAYS IN EXECUTION AND HOW THESE ARE BEING/WERE CAUGHT UP

Over the last six months the delays in accessing data sources should be highlighted. However, additional effort, with the involvement of more human resources within the team, was sufficient in order not to compromise the deliverable planned for this first period.

7 STATUS OF DELIVERABLES/MILESTONES DUE WITHIN THE NEXT 7 MONTHS OF WP11

The goal of having a 100% operational dashboard to display to the end-users in Gothenburg is very ambitious one and, of course, there is the risk of not being fully achieved. As a mitigation strategy, we will be keeping in operation an expanded team that is working on a contingency plan, allowing us to understand and timely predict what will be state of the operational dashboard at the time of the ESPO annual conference.

It should be mentioned that we consider this conference a very important milestone in order to collect end-user feedback. The more technology we have to show, the more in-depth will be the contributions issued by the industry.

8 LONGER-TERM OUTLOOK (BEYOND THE NEXT 6 MONTHS)

After having undertaken a strategy of anticipating risks, by adopting prototyping Data Warehouse models, we consider that there are no obvious reasons to believe that the success of any of the deliverables is at risk.

After prototyping the dashboard and subsequently gathering feedback by the industry, we will start the formalization process of the prototypes into products and, simultaneously, develop the benchmarking platform potential.