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D6.3 Report of impact and outreach results M12

1.3

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**Abstract:**

This document depicts the progress achieved regarding the impact and outreach activities carried out in the first year of the project. More specifically, presents the execution plan toward the KPIs' fulfilment, reviews the achieved KPIs and defines potential correction measures.

**Keywords:**

Impact, Outreach Activities, methodology, categorization, target groups, KPI monitoring, survey, diffusion channels metrics, key messages

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## 1 EXECUTIVE SUMMARY

The ambition of deliverable (D6.3) is to provide the execution plans for each Impact Key Performance Indications (KPI), that were presented in DoA and propose necessary adjustments to fit with the scope of the project and the port pilots, as these are defined by now. The purpose is to present the Impact KPIs and set up a process to monitor and evaluate the execution and the measurements whether are qualitative or quantitative at specific milestones. These milestones were set by each WP and more precisely by each partners associated with the KPIs.

Within the context of this document, it is presented the association of DataPorts with specific impact categories and the involvement of specific tasks of the project that in accordance to the creation of a seaport ecosystem and the need for vast volumes of data that will be shared/offered among its stakeholders and benefit from the offered based services, in order to improve the level of operations, the interoperability, the data governance, within a secured environment. The benefits for the stakeholders depending on their position, can be social, improving the services offered to the passengers, economic, increasing the revenues or reducing the operational costs, environmental by reducing energy footprint and pollution levels, and innovative by offering newly introduced services.

The Impact KPI section (4.2 Execution P) presents the association of the Impact KPIs with DataPorts WPs towards their fulfilment, to monitor their progress during their entire execution and evaluate the results. Each KPI follows separate execution plan and the milestones are set accordingly. The Impact KPIs follow the MoSCoW method that collects needs of DataPorts WPs and Task.

Measuring the impact of DataPorts is of great importance for its adoption by the stakeholders, internal and external, towards the expansion and the enhancement of the seaport ecosystem and its operations on the way to its transformation. By fulfilling its KPIs, DataPorts, will be able to gain credibility by the seaport community actors and the general public that will benefit for the proposed services. The insights that can be excluded from the project's impact and outreach activities will be the baseline for the DataPorts expansion and its adoption by the major European seaports and assist in making potential future investment decisions.

KPIs' progress monitoring is capturing data from measurements that are collected according to the execution plan of each KPI and assessing them to meet specific goals and objectives that will be presented in a KPI Assessment excel tool (Dashboard). The monitoring of each KPI will be obtained in a KPI Assessment Dashboard and will be reported on an annual basis within the context of D6.3 revisions [M24], [M36]. It will provide an at-a-glance view of the progress to have a better picture on how the entire DataPorts Impact is progressing.

The Dashboard includes the associated WP and Tasks, the execution plan, the business rationale, the initial and the updated milestones, the impact category, the priority, the assigned partner if it is necessary and the Key Risk Indicator (KRI) regarding potential risks and the overall evaluation that will be filled in D6.3 revisions.

The creation of a seaport ecosystem and the collaboration with external stakeholders will increase the adaptation level of DataPorts platform. Several Impact KPIs require input from external sources (3rd parties) to be fulfilled. Hence, necessary actions in terms of communication activities are proposed.

Through the annually conducted surveys, the impact of the DataPorts activities will be dependent in high degree by the results extracted from the surveys. The responses collected from the surveys will offer valuable insights for DataPorts. They will also be a valuable source to measure the actual impact of the designed data platform, at different implementation stages and through this evaluation, give valuable insights in terms of data platform's functionality and its usage. The surveys will take place in three different phases of the project and follow the requirements and the platform implementation stages. The targeted responders may be businesses and individuals that are currently related to the seaport's community but will try to have responses from private and public bodies that potentially may benefit from their involvement with the shipping ports.

More specifically, OTE as an Impact Manager conducted a survey between Oct. 1st and Nov. 5th and numerous of participants were invited by all partners. The purpose was to collect responses from key players in seaports' ecosystem and from various fields of operations that potentially be part of this dynamically emerging market. Within the running period, 91 responses collected by related to seaports organizations and individuals.

The deliverable (D6.3) also present the results and the analysis of the conducted survey aiming to identify the needs of the seaport ecosystems for data and service, validate the assumptions of the potential beneficiaries and the target groups of organisations or individuals for DataPorts platform and the port pilots' ecosystem in general. The survey was also intended to bring into the front previous experiences with similar data driven platforms and identify difficulties the users had experience related to security issues. In addition, the survey analysis presents the results on the characteristic parameters that a data driven platform should have from the responders' point of view.

Within the content of outreach activities and to increase the impact of DataPorts project on the academic and developers' community, ICCS organized a series of application development challenges (App-athon), with the vision of improving citizens' quality of life. The App-athon took place during the spring semester 2019-2020 "Internet & Applications" course, which is part of the education program of the School of Electrical and Computer Engineering of the National Technical University of Athens (NTUA). In the context of the App-athon, students and developers were requested to create innovative applications, on top of open data sources, but also exploiting data coming from various H2020 EU projects. One of the major requirements, that the participants had to fulfil, was the usage of at least one dataset, either open or proprietary. For this reason, the organizers gave access to specific data sources (under specific rules), mainly derived from H2020 EU projects, in which ICCS is involved. In the case of DataPorts, the participants had the chance to create knowledge, analysing subscribers' mobility data provided by OTE.

This deliverable also points out the possible difficulties, due to the existing covid-19 pandemic. Several actions regarding the execution plans of the Impact KPIs that were planned to be taken may be forced either to be delayed, use other approaches, or cancelled. Such cases may affect the pilots' execution and therefore the KPIs' fulfilment. Hence, immediate actions will be taken accordingly.

## 2 INTRODUCTION

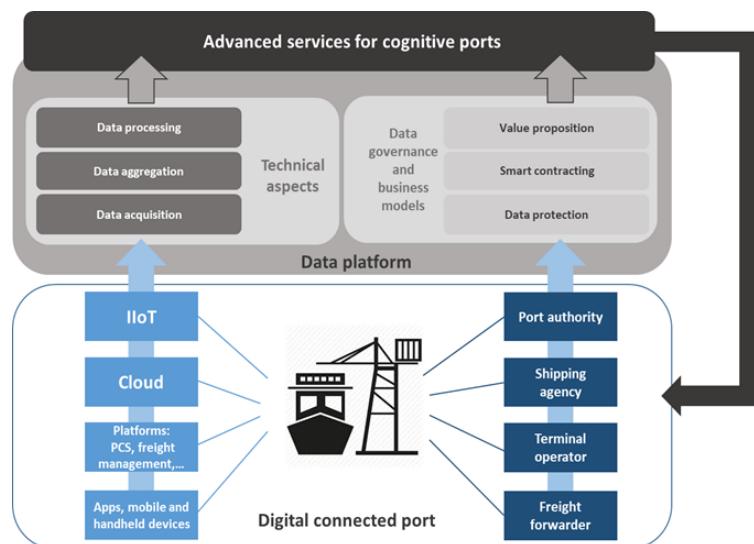
### 2.1 DATAPORTS PROJECT OVERVIEW

DataPorts is a project funded by the European Commission as part of the H2020 Big Data Value PPP programme, and coordinated by the Technological Institute of Informatics (ITI). DataPorts rely on the participation of 13 partners from five different nationalities. The project involves the design and implementation of a data platform, its deployment in two relevant European seaports connecting to their existing digital infrastructures and addressing specific local constraints. Furthermore, a global use case involving these two ports and other actors and targeting inter-port objectives, and all the actions to foster the adoption of the platform at European level.

Hundreds of different European seaports collaborate with each other, exchanging different digital data from several data sources. However, to achieve efficient collaboration and benefit from AI-based technology, a new integrating environment is needed. To this end, DataPorts project is designing and implementing an Industrial Data Platform.

The DataPorts Platform aim is to connect to the different digital infrastructures currently existing in digital seaports, enabling the interconnection of a wide variety of systems into a tightly integrated ecosystem. In addition, to set the policies for a trusted and reliable data sharing and trading based on data owners' rules and offering a clear value proposition. Finally, to leverage on the data collected to provide advanced Data Analytic services based on which the different actors in the port value chain could develop novel AI and cognitive applications.

DataPorts will allow establish a future Data Space unique for all maritime ports of Europe and contribute to the EC global objective of creating a Common European Data Space.



### 2.2 DELIVERABLE PURPOSE AND SCOPE

Specifically, the Description of the Action (DoA) states the following regarding this Deliverable:

This document D6.3 – Report of impact and outreach results (M12), is the first annual report of the outreach activities in the context of maximizing the impact of DataPorts. This document proposes the execution plans for each KPI described in the DoA, proposes potential correction measures and proceeds with new realistic ones. Formal iterations regarding the monitoring and the assessment of the Impact KPIs are planned for M24 and M36.

D6.3 establishes the execution planning strategy, monitors the progress and proposes assessment mechanisms for each impact KPIs towards the adoption of DataPorts platform by the Shipping Port's Ecosystem. Each Impact KPI is associated with specific Tasks or WPs.

Deliverable D6.3 is produced within the context of WP6 and its general objective is to propose and measure outreach of project activities and results, in order to foster the adoption and use of the platform by the stakeholders in shipping ports communities, and the population by data and service owners and providers. The main objective of the associated Task T6.2 is to maximize the impact of the project in the identified targeted audiences that is the shipping port's ecosystem, internal and external stakeholders.

More specifically, the objective of this T6.2 is to measure the impact of the project in selected areas of the shipping port's ecosystem. It is planned to be achieved through surveys, webpages, organising or participating in workshops, and social media, aiming to gather the indexes that measure the DataPorts impact on selected areas, in the impact assessment of the revenue streams that will be created for the ports after the efficiency of the operations and through the data and services that can be potentially shared among the port ecosystem's stakeholders. Results will be used as input for T6.4 to engage initiatives that will scale up at a European level. Results about impact and outreach will be reported in the different versions of D6.3, which will be updated yearly. The current version reports the first 12 months of the project M1 – M12.

## 2.3 DELIVERABLE CONTEXT

Its relationship to other documents is as follows:

**Primary Preceding documents:**

- Description of Action (DOA): Provide the foundation for the actual research and technological content of DataPorts. Importantly, the Description of Action includes a description of the overall project work plan.

**Primary Dependant documents:**

- None

## 2.4 DOCUMENT STRUCTURE

The document includes an introductory section with a basic summary of the Task 6.2 and its objectives with its specific scope. In the following sections, the deliverable is divided into the followings:

- **Section 1:** Introduction that includes the purpose and the scope of the document
- **Section 2:** Impact overview that presents the ecosystem and the impact categories
- **Section 3:** Key Performance Indicators (KPIs) that presents the impact KPIs and the execution plans
- **Section 4:** Outreach activities that includes the conducted survey and the App-athon contest and results
- **Section 5:** Next milestones on impact that presents the future work
- **Section 6:** Conclusions.

Annexes

- **Annex A:** Survey # 1 – Online Questionnaire
- **Annex B:** Survey # 1 – Graphical Results

### 3 IMPACT OVERVIEW

#### 3.1 OBJECTIVES

Measuring the impact of DataPorts is of great importance regarding its adoption by the stakeholders, the expansion and enhancement of the seaport ecosystem and its operations, on the way to its transformation. Achieving the KPIs set, DataPorts will be able to assert its credibility with the seaport community, and the general public that will benefit by the proposed services. The insights that can be excluded from the project's impact and outreach activities will be the baseline for the DataPorts expansion and its adoption by the major European seaports and assist in making potential future investment decisions.

#### 3.2 ECOSYSTEM IDENTIFICATION / CREATION

The basis for port transformation lays within the co-operation that takes place between strategic partnerships at national and international levels. There is a new ecosystem being created around the seaports that is highly competitive and ports are trying to get an advantage by implementing smart technologies and services to optimize their operations in many areas such as energy, security, transport, logistics and more. Local Port Authorities gather around numerous entities. Organizations, associations, private companies may be their stakeholders and potentially beneficiaries of a data-oriented platform provided by DataPorts. The list can be endless if attempting to put everyone in the frame but trying to pin-point the main ones we can identify synergies within Academia and Research Community, Shipping companies, SMEs and Startups, Public Authorities and Policy Makers, Data Providers, and Local Community Associations (Commercial, Tourism, Culture, etc.)[1].

Smart and Cognitive Ports is the newest trend and like the Smart Cities is a creation of a new emerging data market. It is a term that expands the traditional stakeholders' ecosystem with limitless opportunities for new entries.

This rapid growing ecosystem with many actors and many roles, needs to fulfil the also rising needs. This opportunity was early identified by European Union (EU) in 2014 [5], where a special chapter was included within the Smart Cities one. "Ports are considered a special case of a Smart Community, then they have to meet the same requirements that are asked for a Smart City, adapted to the port situation".

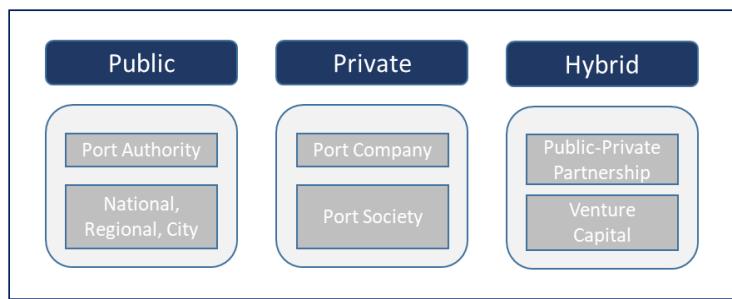


Figure 1 Port Operation Models [2]

As depicted in Figure 1, the operation type classification that ports operate in different models is shown. They can be Public, where the administration is operated by a central authority at a national, regional or city level, or Private, a model that is run by a port company, or even a port (local) society and Hybrid where public-private partnerships govern the port administration and the provided services. Hence, Port Authorities, whether Private, Public, or Hybrid, are "forced" to transform and create the Ports of the future to ensure their existence. The seaports' transformation can be achieved, not only by creating an interconnection grid between them, but offering new innovative services to their current customers and users, like companies in shipping, logistics, tourism, and many more from different areas, that they can take advantage from the new services. Therefore, Port Authorities create synergies with research community, data owners and providers, software-houses, startups and SMEs, to offer to the seaports' community new innovative services.

This need of Port Authorities has become an opportunity for port-oriented companies to experiment their wide range of services, algorithms, and data that they own, as well as a chance for monetising their offerings in this new emerging market. It is an opportunity, which could be beneficial for numerous stakeholders. This opportunity increases the dynamics of the Smart Ports or Ports of the Future transformation.

Ports of the Future towards the journey to become Smart and Cognitive involves adoption of innovative solutions that are focused on the challenges that Port Authorities come across, and contain regional characteristics, diversity, efficiency and sustainability, new business opportunities, security, and many more. As in the Smart Cities transformation, Port-related key-players would gain competitive advantages through the adoption of new data-driven business models, emphasizing the use of the As a Service operational model.



**Figure 2 Seaport Ecosystem of the Future**

As Figure 2 depicts, the existing seaport ecosystems has the opportunity for expansion and includes stakeholders that until now where out of the frame. This opportunity is given by the newly offerings of data and AI-based services, creating a fast grow emerging data market. A faster adoption of the data driven platform as proposed by DataPorts, not only benefits the Pilot seaports (VPF, ThPA) but also acts as a leverage for a global economic growth. In order DataPorts to have a sufficient impact in the seaports ecosystem, different approaches should be followed for different target audiences as was previously presented in detail in D6.1, where target audiences originally introduced.

### 3.3 IMPACT GENERAL CATEGORIES

DataPorts aims to have a significant influence to the seaport ecosystem and increase the volumes of data that are shared among its stakeholders and benefit from the proposed AI-based services in order to improve the level of operations, the interoperability, the data governance, the security, etc. The benefits for the stakeholders, depending on their positions, can be:

- **Social (S)**, improving the services offered to the passengers
- **Economic (EC)**, by increasing the revenues or reducing the costs
- **Environmental (E)**, by reducing energy footprint and pollution levels
- **Innovative (I)**, by offering newly introduced services.

Those benefits are further detailed in the following subsections.

#### 3.3.1 Social

The social impact that DataPorts can have on people and ecosystem, resulting from offered services to seaport's passengers, the local community, and the policies that may be introduced based on the exploitation of the offered services. DataPorts may have a positive social effect by improving services compared to the current ones, as well as, by attracting new stakeholders or investments. To measure the social impact of DataPorts, considerations should be given with respect to the sustainability, identify the social entities that

can benefit, the number of people that may benefit (from policy improvements or services directly offered to people), and the degree of the benefit for the local community.

### 3.3.2 Economical

Economic KPIs for DataPorts indicate how well the project's is adopted by seaports at a European level and generate revenues and profits for the seaports and the involved stakeholders. Monitoring KPIs and continuously adapting them accordingly will achieve long term benefits for the stakeholders.

### 3.3.3 Innovation

Innovation is meant to create changes in the operational processes. Identifying growth in many aspects where most of the time adopting innovative approaches leads to save time and money. The innovative approach and the offerings in the context of DataPorts measured by KPIs aim to increase the offered cognitive AI-based services, and ensure data sharing security and improved data governing mechanisms, allowing more individuals and enterprises to use them.

### 3.3.4 Environmental

Environmental KPIs of DataPorts are quantifiable metrics that reflect the environmental performance of the project within the pilot ports (VPF & ThPA). Seaports as an industrial environment, have a significant role in the local and regional environmental footprint. Offered data and services aim to be useful and act as a leverage for the installation's management of energy, natural resources and improve the current performance. Based on the seaports' regional characteristics different KPI may be applied. Fulfilment on behalf of DataPorts will not only benefit the seaport itself but also provide useful insights for the local public authorities. These will also result on the financial performance of the seaports, as well as it will be compatible with EU's commitment that is "transport should become drastically less polluting", highlighting in particular the urgent need to reduce greenhouse gas emissions (GHG) in aviation and waterborne transport (WT)".

Table 1 depicts the association of the Impact Categories with the KPIs that are address within DataPorts. Originally addressed KPIs as well as the newly introduced ones were chosen based on social, economic, innovative and environmental characteristics. Later in this document, an additional categorization will be presented, classifying the Impact KPIs based on their functionality Figure 3, as well as, on their association with specific WPs.



Figure 3 KPI Functionality Categories

WPs	ID	KPI Description	S	EC	I	E
General KPIs	I.6.1	30% annual increase in user/buyer organizations using industrial data platform		X		
	I.6.2	Increase of data exchange between port authorities and internal stakeholders, as well as, among ports managed by the same authority	X	X		
	I.6.3	Increase of availability of external data by the Port Authority	X	X		
	I.6.4	The number of the data provider organizations participating in the data provider platform must increase by 20% annually		X		
	I.6.5	Increase of the number of innovators around port and logistics in the port cities		X		
	I.6.6	30% annual increase in volume of business(turnover) channelled through the platform for companies in the ICT sector		X		
	I.6.7	20% annual increase in volume of business(turnover) channelled through the platform for logistics actors	X	X		
	I.6.8	The newly introduced data services must exhibit 40% faster time to market		X		
WP2	I.6.2.1	Participation in at least 3 standardization bodies and alliances related with the submission of four contributions related with the outcome of the project.				

WPs	ID	KPI Description	S	EC	I	E
WP3	I.6.2.2	Improved synchro-modality in multi-modal terminals			X	
	I.6.2.3	The solution concept shall ensure scalability to be able to be adopted in similar contexts where passengers traffic is very high during specific seasons			X	
	I.6.2.4	20% increase in the container reuse rate in the Valencia port		X		X
	I.6.2.5	10% reduction in the number of containers not loaded due to delays in the Valencia port	X		X	
	I.6.2.6	10% reduction in container operations' costs in the Valencia port	X		X	
WP4	I.6.3.1	The newly introduced data services must exhibit less development effort by 50%	X			
	I.6.3.2	The newly introduced data services must exhibit 20% increase in data volumes	X			
	I.6.3.3	Increase of the portfolio of services and data driven business models concerning the port management integration	X	X		
	I.6.3.4	Number of agent templates provided by the Data Access SDK			X	
	I.6.3.5	Number of Data Models integrated			X	
WP4	I.6.4.1	100% of the IT risks identified from the Security Plan obtained in D4.1 must have a security measure identified in order to mitigate, avoid, or transfer the risk.			X	
	I.6.4.2	Blockchain (BC) will minimize the number of data transfers to unauthorized parties				
	I.6.4.3	BC will minimize the number of data leakage.				
	I.6.4.4	BC will increase the amount of shared data among parties of the port business network				
WP5 - ThPA	I.6.5.T.1	20% decrease in the CO2 emissions at the gates of the Thessaloniki port				X
	I.6.5.T.2	15-20% decrease of trucks service time	X	X		X
	I.6.5.T.3	Improvements of the traffic conditions inside the port and in its area of influence	X	X		
	I.6.5.T.4	20% increase of operational effectiveness of ThPA community		X		
WP5 - Global Use Case	I.6.5.G.6	Increase data from Posidonia Port Solutions products available to third / other organizations	X	X		
	I.6.5.G.7	Easy new Posidonia Port Solutions products data sources integration	X			
	I.6.5.G.8	Number of Posidonia Port Solutions products data sources integrated	X			
	I.6.5.G.9	Ease following Posidonia Port Solutions products and platform integration on other deployments	X			
	I.6.5.G.10	Data fusion of the same asset from different sources			X	
	I.6.5.G.11	Engage final clients in DataPorts and Posidonia Port Solutions products	X	X		
WP5 - VPF	I.6.5.V.4	Improved knowledge of hazards of the freights during sea routes	X			X
	I.6.5.V.5	Decrease of wrong or inefficient routes detection as part of the overall route optimization	X	X		
	I.6.5.V.6	Decrease of accidents/disputes around container crashes	X			X
	I.6.5.V.7	Reduction of transport and logistic costs per box and per kilo	X			
	I.6.5.V.8	Reduction of steal and intrusion risk in high-value containers	X			
	I.6.5.V.9	Improvement of berthing/unberthing smart container operations	X			
	I.6.5.V.10	Improvement of the last-mile operations in logistics	X			
	I.6.5.V.11	Reduction of the cold chain risks	X			
	I.6.5.V.12	Increase in landside operations efficiency (boxes/hour) concerning smart containers	X			

**Table 1 Impact Categorization**

## 4 KEY PERFORMANCE INDICATORS (KPIS)

Through the Impact KPIs that were initially presented in DoA, DataPorts aims to measure its impact to the seaport community, along with its level of adoption, not only by the seaports, but also for every involved to be party and therefore contributing to the objective ICT13-2019: "Supporting the emergence of data markets and the data economy". DataPorts addresses equally strategic high-level goals set by the European Union, as well as practical stakeholders' and end users' needs related with data platforms, data markets and the data economy. DataPorts reflects Europe willingness to create and offer integrated data platforms within and across different application domains. KPIs are originally designed to have an impact on the European Union seaports transportation relevant agents (e.g. Port Authorities; shipping companies or infrastructure integrators and operators) and to provide integrated, secure, private and interoperable data related services. Impact KPIs that are following the previously mentioned categories.

During the first 12 months of the project an investigation was obtained to create an execution plan for each KPI that was initially described in DoA. However, there was a need for more accurate definition for some KPIs, as well as, modifications and deletions, in order KPIs to be in accordance to the DataPorts objectives and have viable and realistic targets. Section 4.3 KPI Modifications, provides a respective analysis.

Disclaimer: Even if KPIs must be measurable to define a certain standard with a specific objective, there are several KPIs described in DoA that cannot be accurately measured or set a specific target, yet they meet objectives of DataPorts. In the revisions of this deliverable, these KPIs has been modified, in order to be able to be measured and their results to be clearer.

### 4.1 METHODOLOGY

Every KPI that was initially presented in DoA was thoroughly investigated to meet certain criteria and bring specific business outcomes. The proposed KPIs follow the steps below during their definition/modification:

- What is your desired outcome?
- Why does this outcome matter?
- How are you going to measure progress? (Execution plans will be presented later in this document)
- How can you influence the outcome?
- Who is responsible for the business outcome?
- How will you know you have achieved your outcome?
- How often will you review progress towards the outcome? (Based on the execution plan, KPIs will be measured accordingly and reported on D6.3 revisions M24 and M36)

Nevertheless, some KPIs that will be presented later in this document have been modified in certain cases, in order to be more realistic, according to the scope of the pilots and meet newly introduced needs. All the Impact KPIs that changes are proposed, and a proper justification is provided. Hence, certain considerations have been taken. More precisely, the relevance and the consistency of DataPorts vision and strategy, to be realistic and according to the business needs, to be specific and avoid misinterpretation, to be measurable whether it may be either quantitative or qualitative, to be feasible to be measured on a given timeframe and understood for all the DataPorts partners. Hence, Impact KPIs will be monitored periodically, and updates on execution plans will be reported accordingly to avoid failure on capturing the impact and miss strategic goals.

The Impact KPIs assessment may follow the same approach as the one proposed in D6.2. Similarly, every WP Leader will evaluate the execution steps and the progress of the fulfilment according to the categories depicted in Table 2 and report them on the next D6.3 revision (M24). Based on the evaluation and according to the phase of the execution, adjustments may be applied for each KPI.

Categories		General actions or measures
0	Immediate action necessary	KPI is below the expected value. Improve the impact activities relevant to KPI
1	Needs further attention	KPI is slightly below expectations. Further measures for improvement need to be discussed and addressed to partners
2	Good progress	KPI is on track with the execution plan and strategy. No corrective actions are necessary. Continue with the monitoring
3	Overachievement	KPI exceeds the expectations! The Impact execution plan is possibly under evaluated. Shift or concentrate efforts to other Tasks with lower performances

Table 2 On-site Impact KPI evaluation

#### 4.1.1 KPI Categorisation

Besides the previously described categorization, and to ensure the feasibility of the execution plans, Impact KPIs were assigned to WPs according to their objectives. Each WP was assigned to investigate each KPI, propose an execution plan and setup important milestones for its progress and for measurements. In the cases where the initial KPI was evaluated and was deemed incompatible with the purpose of the project and needed to be revised, and updated version is provided and together with the proper justification.

Impact KPIs will be reviewed based on their execution plan and will be depended to the progress of each WP in order WP teams to have the chance to fine tune – or change course entirely. KPIs of DataPorts are not static and therefore, there is always a need to evolve, update and modified as needed, otherwise the risk of not fulfilling a KPI is increased.

## 4.2 EXECUTION PLAN

Impact KPIs were assigned to WPs to monitor during their entire execution plan and results evaluated within the involved partners. The description of each KPI and the proposed execution plan are described in the following sections. Each KPI follows separate execution plan and milestones are set accordingly. This document presents the Impact KPIs using the MoSCoW method [3] that collects needs of DataPorts WPs and Tasks.

#### 4.2.1 General Impact KPIs

This category contains more generic Impact KPIs that may be associated with more than one WP. The assigned partners will collect information from all involved WPs.

The DataPorts Platform should be easy for the user to become familiar with and competent in using the interface on the first contact with the platform. This will increase the impact and therefore adoption by the end-users. This will create a sustainable solution with benefits for the data providers, the DataPorts Platform owners and eventually for the external stakeholders. This will be a paradigm for additional users in a numerous categories and fields of operations, in public or private sector.

Measuring usability or engagement can often be expensive and metrics may be proven useful for decision-making purposes. This is critical for Platform's improvements toward the greater adoption by the end-users.

ID	Type	Category	Source	Priority	Associated Tasks
I.6.1	Non Functional	Engagement	End-Users	MUST	WP6 / WP7
<b>Title</b>		30% annual increase in user/buyer organizations using industrial data platform			
<b>Assigned Partner</b>		ITI			

<b>Description</b>					
This KPI is intended to measure the increase of organisations that will adopt and use the DataPorts platform. It focuses on those organisations that are associated with the port pilots and the global use cases and aim to provide or consume data or services.					
<b>Execution Plan</b>					
This KPI is focused on the increase of organisations using DataPorts thanks to the global use cases. In M24 we will measure the users in the two pilots (VPF and ThPA), and in M36 we will add those of the Global Use Cases, and an increase of 30% will be expected.					
<b>Milestone # 1</b>	<b>M24</b>	Initial Measurement - Measure the organisations in the two pilots (VPF and ThPA)			
<b>Milestone # 2</b>	<b>M36</b>	Final Measurement - Add the organisations of the Global Use Cases			
<b>Risk</b>		The easiness of 3rd parties to access the platform			
<b>Evaluation</b>		Nothing to evaluate yet			

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.2	Non Functional	Usability	End-Users	MUST	WP3 / WP4				
<b>Title</b>		Increase of data exchange between port authorities and internal stakeholders, as well as, among ports managed by the same authority							
<b>Assigned Partner</b>		ITI							
<b>Description</b>									
This KPI is focused on the data exchange occurred between port authorities and internal stakeholders, to enhance data interoperability and measure the actual impact of DataPorts.									
<b>Execution Plan</b>									
Port authorities will be asked to provide the volume of data exchanged as part of the DataPorts demonstrations, only data not shared before. There should be an increase between M24 and M36.									
<b>Milestone # 2</b>	<b>M24</b>	Initial Measurement - Measure the new data volumes exchanged internally in the two pilots (VPF and ThPA)							
<b>Milestone # 3</b>	<b>M36</b>	Final Measurement - Measure and compare the additional data volumes exchanged internally in the two pilots (VPF and ThPA)							
<b>Risk</b>		No risk is expected							
<b>Evaluation</b>		Nothing to evaluate yet							

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.3	Non Functional	Usability	End-Users	MUST	WP5 / WP4 /WP7				
<b>Title</b>		Increase of availability of external data by the Port Authority							
<b>Assigned Partner</b>		OTE							
<b>Description</b>									
Data providers, data consumers and data prosumers (Those who offer and consume data) need to be on-board the DataPorts platform. This may be achieved in collaboration with KPI I.6.4, when the platform is deployed.									
<b>Execution Plan</b>									
Working in parallel with KPI I.6.4, the idea is to use among others, surveys, direct messaging, newsletters, or any other communication tools to inform the external stakeholders about the benefits of using DataPorts platform. Moreover, the possibility to offer through the platform access (links) to open data related to the seaports' operations and needs will be investigated.									

<b>Milestone # 1</b>	<b>M24</b>	Initial Measurement – Feedback from the communication with external actors							
<b>Milestone # 2</b>	<b>M36</b>	Final Measurement – based on the platform deployment, final measurements of externals on boarding DataPorts							
<b>Risk</b>	The willingness of 3rd parties to share their data								
<b>Evaluation</b>	Nothing to evaluate yet								

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.4	Non Functional	Internal Technical Analysts	End-Users	MUST	WP5 / WP4 /WP7				
<b>Title</b>	The number of the data provider organizations participating in the data provider platform must increase by 20% annually								
<b>Assigned Partner</b>	OTE								
<b>Description</b>	Currently, there is not any data provisioning. Therefore, we should focus on the on-boarding data providers in order to increase the offered datasets. Actual numbers will be available when the deployment of the platform will be available.								
<b>Execution Plan</b>	The process to engage data providers and on-board them to DataPorts will begin before M18 where technical discussions with third parties will be substantial. For that reason, a list for target groups will be created and will be categorised. Actual numbers can be set on M36 and get input from I.6.3 and I.6.5.								
<b>Milestone # 1</b>	<b>M24</b>	Phase 1: Results from communication with data providers and record their intention to offer their data							
<b>Milestone # 2</b>	<b>M36</b>	Phase2: Measure the number of data providers joined DataPorts at the end of the project							
<b>Risk</b>	The easiness of third parties to access the platform								
<b>Evaluation</b>	Nothing to evaluate yet								

ID	Type	Category	Source	Priority	Associated Tasks
I.6.5	Non Functional	Performance Efficiency	Internal Technical Analysts	MUST	WP5, T5.5
<b>Title</b>	Increase of the number of innovators around port and logistics in the port cities				
<b>Assigned Partner</b>	OTE/PRO				
<b>Description</b>	This KPI attempts to establish synergies with selected data providers/consumers with innovative services. In this category start-up companies are considered as a characteristic example.				
<b>Execution Plan</b>	Since innovators are considered mainly start-ups in maritime/shipping and data services, it is proposed to initiate discussions with the ecosystem, informing about the scope and the vision of DataPorts and have them on-board as service providers. A process that will send Introductory letters by email to collect their intentions and potentially to participate in DataPorts as external data consumers or data providers will be initiated.				
<b>Milestone # 1</b>	<b>M18</b>	Initial Measurement – Initiate communication			
<b>Milestone # 2</b>	<b>M24</b>	Mid period Measurement – Discuss connectivity and intentions			
<b>Milestone # 3</b>	<b>M36</b>	Final Measurement – Measure actual on boarding			
<b>Risk</b>	The easiness of 3rd parties to access the platform				

<b>Evaluation</b>		Nothing to evaluate yet							
<b>ID</b>	<b>Type</b>	<b>Category</b>	<b>Source</b>	<b>Priority</b>	<b>Associated Tasks</b>				
I.6.6	Non Functional	Usability	End-Users	MUST	WP7, WP5				
<b>Title</b>		30% annual increase in volume of business (turnover) channelled through the platform for companies in the ICT sector							
<b>Assigned Partner</b>		FHG							
<b>Description</b>									
This KPI is not able to monitor during the project, as it requires an established platform community and user base, which is outside of the project scope. Moreover, this is dependent on external factors, like the appetite and acceptance of the platform for external stakeholders. There are two main ways this KPI can be targeted in the project: First, the KPI can be achieved in the project scope by associated project partners, namely OTE/PRO (I.6.6) and THPA/VPF (I.6.7), as representatives of the associated categories in the use cases. Second, the exploitation plan can target these issues during development, providing incentives for the respective industry sectors to take part in the platform.									
<b>Execution Plan</b>									
1. Internal KPI observation As the percentage points are too high for a use case to be feasible, a decreased percentage point of 5% (I.6.6) and 2.5% (I.6.7) are proposed as measurements for the pilot settings. They will be finalised in the following months and will be aligned with WP5 planning. High involvement of WP5 and WP6 Partners is expected. Extrapolation from a smaller time of active usage should be performed with a forecast for expected turnover for each partner.									
2. Exploitation planning Targeted Business Models and exploitation plans are expected and to be considered when inspecting this KPI. Non-conformity with these KPIs will result in deliverable overhaul to guarantee KPI conformity. Higher priority is given to incentives for the named industry sectors to participate with a focus on their gains through platform usage. Additionally, awareness of the platform is to be considered, with marketing and community building aimed at these stakeholders being of higher priority									
3. KPI estimation An effort will be given to define more realistic values through a market research: By investigating other sectors, where digitalization and platform usage had impact on business turnover (e.g. Amazon Web Services (AWS), Microsoft Azure, etc.). By communicating with the target groups (logistic sector actors, ICT sector companies) on their expected revenue increase on platform adoption, as well as their desired increase.									
<b>Milestone # 1</b>	M24	Mid-period Measurement – Re-evaluate realistic targets - marketing and community building							
<b>Milestone # 2</b>	M36	Final Measurement – Set up realistic number related to market research							
<b>Risk</b>		The easiness of 3rd parties to access the platform							
<b>Evaluation</b>		Nothing to evaluate yet							

<b>ID</b>	<b>Type</b>	<b>Category</b>	<b>Source</b>	<b>Priority</b>	<b>Associated Tasks</b>				
I.6.7	Non Functional	Usability	End-Users	MUST	WP7, WP5				
<b>Title</b>		20% annual increase in volume of business(turnover) channelled through the platform for logistics actors							
<b>Assigned Partner</b>		FHG							
<b>Description</b>									
Like KPI I.6.6									
<b>Execution Plan</b>									

		Like KPI I.6.6 but targeted to logistics actors
Milestone # 1	M24	Mid-period Measurement – Re-evaluate realistic targets - marketing and community building
Milestone # 2	M36	Final Measurement – Set up realistic number related to market research
Risk	The easiness of 3rd parties to access the platform	
Evaluation	Nothing to evaluate yet	

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.8	Non Functional	Performance Efficiency	End-Users	MUST	WP2 / WP4 T2.3, T4.1				
<b>Title</b>		The newly introduced data services must exhibit 40% faster time to market							
<b>Assigned Partner</b>		OTE / TRX							
<b>Description</b>									
To achieve faster time to market of DataPorts platform there is a need to identify the available data/services. Therefore, a plan will be created based on the conducted survey that identifies the market's need for data and services as well as the creation of a product catalogue by DataPorts partners.									
<b>Execution Plan</b>									
Results from Survey #1 that will be included in D6.3 [M12], along with the Product Catalogue from D7.1 will give a valuable insight regarding the newly introduced data services.									
A matter of investigation within this KPI is the current time to market and the availability of the Data that can directly go to market.									
In order data services to reach the markets in a faster pace and eventually create more revenues to the stakeholders, there is a great need to increase the available data services and enrich them with added values such as analytics. Therefore, in order KPI I.6.8 to be fulfilled I.6.4 and I.6.5 are considered as prerequisites. By then, the demand for new data services will be increased and hence the time to market will be improved to a faster degree. Within the context of DataPorts, outreach/dissemination activities should be designed towards that goal. Moreover, the available to offer data services should follow certain requirements as those described in WP3 and WP5, regarding their accuracy, interoperability, completeness, etc.									
Milestone # 1	M36	Final Measurement- Finalise a Product Catalogue and evaluate survey results							
<b>Risk</b>		The easiness of 3rd parties to access the platform							
<b>Evaluation</b>		Nothing to evaluate yet							

#### 4.2.2 WP2 Impact KPIs

This category contains Impact KPIs that are related to WP2 and the functionalities of a data-driven platform, such as compatibility, scalability, and performance efficiency, that are needed to create an easy-access environment. These KPIs are referred to the contributions related with the outcomes of the project, and address the need of an easy access, will increase the impact and therefore adoption by the end-users.

ID	Type	Category	Source	Priority	Associated Tasks
I.6.2.1	Non-Functional	Certification	Internal Technical Analysts	SHOULD	WP2 / WP6 T6.1
<b>Title</b>		Participation in at least 3 standardization bodies and alliances related with the submission of four contributions related with the outcome of the project.			
<b>Assigned Partner</b>		UPV			
<b>Description</b>					

Regarding KPI I.6.2.1 and considering that there are not any standardization activities explicitly devoted in the work programme, efforts are not directly devoted to this Impact KPI, no further action is necessary. Nevertheless, since it can be related to dissemination activities, it was proposed in D6.1 [M6], that DataPorts will collaborate and position properly in different trending open source initiatives.

#### Execution Plan

During the progress of DataPorts and the deployment of various platform components, the activities envisaged are to contribute to open source projects such as FIWARE [6], Eclipse [7], BridgeloT[8] and also feed the AI4EU platform [9].

<b>Milestone # 1</b>	<b>M24</b>	Initial Planning
<b>Milestone # 2</b>	<b>M36</b>	Final Contribution
<b>Risk</b>	No risk is expected	
<b>Evaluation</b>	Nothing to evaluate yet	

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.2.2	Non-Functional	Compatibility	End-Users	SHOULD	WP2 T2.3				
<b>Title</b>	Improved synchro-modality in multi-modal terminals								
<b>Assigned Partner</b>	PRO								
<b>Description</b>	A data-oriented ecosystem should be created around shipping ports. Therefore, access is an important penetration factor and APIs and any other form of connectivity with other platforms is a necessity and should be feasible.								
<b>Execution Plan</b>	This KPI is associated with the Semantic Interoperability and the Data Abstraction components of the platform. Hence, it will be handled later in the project when the platform's architecture design will be finalised and components will be functional.								
<b>Milestone # 1</b>									
<b>Milestone # 2</b>	M24	Evaluate Progress – Propose execution plan.							
<b>Milestone # 3</b>									
<b>Risk</b>	No risk is estimated yet								
<b>Evaluation</b>	Nothing to evaluate yet								

ID	Type	Category	Source	Priority	Associated Tasks
I.6.2.3	Non Functional	Scalability	Internal Technical Analysts	SHOULD	WP2 / T2.3
<b>Title</b>	The solution concept shall ensure scalability to be able to be adopted in similar contexts where passengers traffic is very high during specific seasons				
<b>Assigned Partner</b>	ICCS				
<b>Description</b>	DataPorts platform should leverage the ports transportation as well as passengers' capacity. In order this goal to be achieved the platform should be designed and developed in a scalable manner. By developing a flexible and scalable architecture for data-driven platform may be a significant challenge. Public and private organizations around the shipping port community want to be able to grow their customer base and increase their benefits with a minimum effort. Therefore, achieving a scalable data-platform to be able to support multiple end-users and services should be				

considered. Passenger oriented services will lead to increase of the passengers to be served by the port and increase accordingly the number of the companies that will provide services to them, besides the local Port Authority.

<b>Execution Plan</b>					
This KPI is a technical one and not totally related with Impact activities within DataPorts, hence it will be implemented within the context of WP2. The execution plan of this KPI will be defined by the completion of the platform's design (context of WP2) and will be presented on deliverable's D6.3 revision (M24)					
<b>Milestone # 1</b>	-				
<b>Milestone # 2</b>	M24	Definition of Execution Plan and set up a new Milestones			
<b>Milestone # 3</b>	-				
<b>Risk</b>	No risk is estimated yet				
<b>Evaluation</b>	Nothing to evaluate yet				

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.2.4	Non-Functional	Performance Efficiency	End-Users	SHOULD	WP2 / T5.2				
<b>Title</b>		20% increase in the container reuse rate in the Valencia port							
<b>Assigned Partner</b>		TRX /VPF							
<b>Description</b>									
Mobility data with approaching to port assistance, along with routing optimization will improve cargo and container transport operations. This will result to a reduction of unnecessary container transfers, to more secured operations, and on the other hand will improve the efficiency of operations, increase the cost cutting and increase revenues. Moreover, performance efficiency in the operations will lead to increase of socio-economic impact to the local community (region, commercial associations, etc.) and offer additional monetization opportunities that will be brought by emerging data-driven business models.									
<b>Execution Plan</b>									
Smart containers enable terminal operators to verify the exact location of each container in real time, to estimate their Estimate Time of Arrival (ETA) for a given containers and plan their operations accordingly.									
<b>Milestone # 1</b>	M18	Equip containers with IoT devices							
<b>Milestone # 2</b>	M24	Sign a contract with Beneficial Cargo Owners (BCO) that are willing to share the data							
<b>Milestone # 3</b>	M36	Port of Valencia will compare the use rate of the smart containers versus regular ones							
<b>Risk</b>	The willingness of BCOs to share data								
<b>Evaluation</b>	Nothing to report yet								

ID	Type	Category	Source	Priority	Associated Tasks
I.6.2.5	Non-Functional	Performance Efficiency	End-Users	SHOULD	WP2 / T5.2
<b>Title</b>		10% reduction in the number of containers not loaded due to delays in the Valencia port			
<b>Assigned Partner</b>		TRX /VPF			
<b>Description</b>					

Similar as I.6.2.4		
<b>Execution Plan</b>		
Smart containers enable terminal operators to verify the exact location of each container in real time, to estimate their time of arrivals (ETA) for a given containers and plan their operations accordingly		
<b>Milestone # 1</b>	M18	Equip containers with IoT devices
<b>Milestone # 2</b>	M24	Sign a contract with BCOs that are willing to share their data to optimize their operations
<b>Milestone # 3</b>	M36	Port of Valencia will compare the use rate of the smart containers versus regular ones
<b>Risk</b>		The willingness of BCOs to share data
<b>Evaluation</b>		Nothing to report yet

#### 4.2.3 WP3 Impact KPIs

A fully functional data platform will lead to an adoption by many users. It should offer a well governed data products and services, with an easy access and delivery mechanisms. Within the offered benefits lies their abilities to give end-users a cohesive view of data from multiple sources and make data available to those users with proper permissions. Data products and services through data platform should provide access to the right data at the right time, when are requested and at the requested accuracy. By being able to fulfil end-users' needs, it will increase the value of the data. Since data-driven platforms and the offering of data are relatively new services, advanced security and authentication tools and mechanisms must be applied and ensure the proper access, and easily keep track of who can access data via the platform. Including datasets that were not easily accessed so far will create an increasing need for additional datasets and promote others to offers their data as well.

The Platform should allow increase of datasets not only by internal data owners/providers but also by external ones who are willing to be engaged in this data-driven ecosystem, offering and receiving data, services and eventually valuable information for their companies.

Hence, if data owners will be able to provide datasets that are of actual need it will increase the request for these datasets and eventually their volume and frequency will be increased accordingly. Freight-related data should ensure the safety of the transported freights and optimize their route.

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.3.1	Non-Functional	Functionality	End-Users	MUST	WP3 T3.4 / WP5				
<b>Title</b>		The newly introduced data services must exhibit less development effort by 50%							
<b>Assigned Partner</b>		UPV / ITI							
<b>Description</b>									
This KPI is intended to measure the improvement of development effort of new services using DataPorts platform. The KPI is focused on the improvement of services provided by the seaports to share data following a cognitive approach, including AI and big data analytics. We expect using DataPorts platform it will be possible for a company to offer new data services to their customers with 50% less development effort.									
<b>Execution Plan</b>									
We will establish as baseline an expert estimation of the development time of a specific service, using its current development approach. We will define several tasks to be accomplish according to the requirements specification from the pilots. Then we will compare the development using the DataPorts platform.									

<b>Milestone # 1</b>	<b>M12</b>	Select and define a development effort estimation approach.
<b>Milestone # 2</b>	<b>M18</b>	Analyse and measure the initial development effort
<b>Milestone # 3</b>	<b>M30</b>	Measure the development effort of the new introduced data services and the % of improvement
<b>Risk</b>		The easiness of Data Consumers to access the platform
<b>Evaluation</b>		Nothing to evaluate yet

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.3.2	Non-Functional	Functionality	End-Users	MUST	WP3 T3.1 / WP5				
<b>Title</b>		<u>Initial Title:</u> The newly introduced data services must exhibit 20% increase in data volumes <u>Updated Title:</u> The newly introduced data/cognitive services will use at least a 20% of the data volume available for the pilot							
<b>Assigned Partner</b>		UPV / PRO							
<b>Description</b>									
<p>This KPI is intended to measure the volume of data used in an effective way of during the project. An aim of DataPorts platform is to increase the value of the data and their aggregated, collaborative usage having thus a further impact on the way that port is relying their business on the data economy. The platform should make efficient use of data in order to achieve a certain degree of effectiveness. A more realistic estimation is that using the newly introduced data/cognitive services will use at least a 20% of the data volume available for the pilot.</p>									
<b>Execution Plan</b>									
<p>We are going to measure the evolution of % of data volumes that are being used by the Big Data and AI services. This KPI needs to be measured during the pilots' execution.</p>									
<b>Milestone # 1</b>	<b>M12</b>	Define a metadata or some log information to measure the data volumes.							
<b>Milestone # 2</b>	<b>M18</b>	Take the information from the first running instances with data and measure the increase in data volumes.							
<b>Milestone # 3</b>	<b>M30</b>	Take the information from use cases deployment and measure the increase in data volumes.							
<b>Risk</b>		The willingness of Data Providers to share data							
<b>Evaluation</b>		Nothing to evaluate yet							

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.3.3	Non-Functional	Functionality / Compatibility	End-Users	MUST	WP3 T3.4 / WP5				
<b>Title</b>		Increase of the portfolio of services and data driven business models concerning the port management integration							
<b>Assigned Partner</b>		UPV / ITI / UDE							
<b>Description</b>									
<p>The main outcome from DataPorts project is a platform for a secure and trusted sharing, trading and brokerage of data, on top of which novel AI and data driven applications could be developed to improve existing processes and discover new business models in the seaport's environment in particular and the logistics value chains in general. For that reason, the aim of this KPI, is to measure the portfolio of services and data driven business models.</p>									
<b>Execution Plan</b>									
<p>This KPI is related with the services designed and developed in Task 3.4. It considers the number of a set of data analytics services for supporting the development of descriptive / predictive / prescriptive models using the different sets of data available at the DataPorts platform. This KPI can be monitored during the evolution of said task and the</p>									

pilots. The increase will be measured considering the existing services before starting the project and those deployed once it is finished		
Milestone # 1	M18	Obtain a first estimation of the services that will be developed in T3.4.
Milestone # 2	M30	Obtain the number of services developed at the end of the project
Risk	The easiness of Data Consumers to access the platform Overall Evaluation:	
Evaluation	Nothing to evaluate yet	

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.3.4	Non-Functional	Functionality	End-Users	MUST	WP3				
<b>Title</b>		Number of agent templates provided by the Data Access SDK							
<b>Assigned Partner</b>		UPV / PRO							
<b>Description</b>									
The data access framework will reduce the development effort and complexity of the software connectors that guarantee the transmission of the raw data from the Data Sources to Semantic Broker using their own native protocols (agents) created to access to the data sources. The templates (i.e. a predefined piece of code used to implement some functionalities of the agents) provide a clear development guide for the most common data sources. The data source integrators (Pilots' Technical Partners) do not need to develop anything from scratch. They only need to focus on the logical part of their data. This KPI aim is to measure the number of types of heterogeneous data sources that can be easily connected to the platform and, for that reason, reduce in a considerable way the development effort in connect a new data source to the platform.									
<b>Execution Plan</b>									
The number of agent templates generated and provided to integrators during the project will give us a reliable estimation of pre-set software components provided to connect the heterogeneous data sources to DataPorts platform. Milestone #1 analyse the heterogeneous data sources to estimate an expected number of templates provided during the project. Milestone #2 will count the number of different templates provided in the data access layer. At this point, the Task related to the Data Access SDK ends. Milestone #3 in the pilots will probably generate new templates, therefore a new indicator will be reported on this date.									
Milestone # 1	M12	Estimate the number of templates needed in the project based on available or interesting data sources.							
Milestone # 2	M18	Obtain the number of templates developed once the data access component has been completed.							
Milestone # 3	M30	Obtain the number of templates developed at the end of the project.							
<b>Risk</b>		The willingness of Data Providers to share data							
<b>Evaluation</b>		Nothing to evaluate yet							

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.3.5	Non-Functional	Functionality	End-Users	MUST	WP3				
<b>Title</b>		Number of Data Models integrated							
<b>Assigned Partner</b>		UPV							
<b>Description</b>									
One of the objectives of the project is to define ontologies, mechanisms, and enablers to provide semantic interoperability with data platforms and the heterogeneous other data sources. The data models used in the project need to be harmonised to enable data portability for different applications. Furthermore, standard interfaces and ontologies will be defined to allow semantic interoperability. They will be specially adapted to the logistics and freight transport sector to be used in the use cases and pilots. The aim of this KPI is to measure the impact achieved by the platform in the design of a secure interoperable system. Facilitating the exchange of data through standardized models									

is based on common semantics and is offering an advanced interconnection capabilities. This is leading to a cooperation between heterogeneous platforms.

<b>Execution Plan</b>		
According to the FIWARE guidelines [6], "Data models are going to be stored in repositories. The lower level repository is a Topic. Every topic repository is aggregated into Domain repositories. Domain repositories compile several topics. At the same time a topic could appear in several domains". We are going to provide the number of topics and data domains covered during the project. Milestone#1 generates the repository where the data models are going to be stored. Milestone#2 and Milestone#3 count the data models defined and integrated during the implementation of DataPorts Platform and during the pilot's execution.		
<b>Milestone # 1</b>	<b>M12</b>	Generate the repository where the data models are going to be stored.
<b>Milestone # 2</b>	<b>M24</b>	Count the data models defined and integrated during the implementation of DataPorts Platform.
<b>Milestone # 3</b>	<b>M30</b>	Count the data models defined and integrated during the pilot's execution
Risk		The willingness of Data Providers to share data
Evaluation		Nothing to evaluate yet

#### 4.2.4 WP4 Impact KPIs

WP4 has the objective to define, implement and test a secure and reliable context to accommodate all data management methods and standards. Subsequently, it is integrated into the DataPorts platform. In addition, the use of blockchain is proposed in relation with smart contracts, to ensure the data exchange security mechanisms and assist DataPorts platform adoption by the seaports' ecosystem.

Therefore, KPIs defined for this WP are related to risk management and security specifications for the environment, data transfers within the platform and from/to external stakeholders, and guarantee confidentiality, availability, and integrity of DataPorts data and functions.

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.4.1	Non-Functional	Cybersecurity controls	Platform architecture	MUST	WP4 T4.1 / WP4 / WP5				
<b>Title</b>		100% of the IT risks identified from the Security Plan obtained in D4.1 must have a security measure identified to mitigate, avoid, or transfer the risk.							
<b>Assigned Partner</b>		EVR							
<b>Description</b>									
A Security Plan, including a Risk Assessment, is going to be developed in WP4, according to Task 4.1. Different impact scenarios will be identified, considering current threats that may affect to DataPorts assets. In this case, each risk identified may be aligned with a security measure, ensuring that the residual risk once treated is acceptable from the risk criteria acceptance defined in the project. In case that for any reason, a security measure cannot be deployed, it must be aligned with mitigated controls aiming to reduce the inherent risk value.									
<b>Execution Plan</b>									
This KPI is related with the services designed and developed in WP's relates with architecture design. It is necessary to identify the assets (data and functions) available at the DataPorts platform, and therefore, subject to threats. This KPI must be obtained once the security plan is finished, considering all different existing scenarios. The increase will be measured considering the existing assets before starting the Security Plan and those modified once it is finished. Additional KPIs within this context might be investigated after M13.									
<b>Milestone # 1</b>	<b>M13</b>	Initial Measurement and Evaluation (review that all security measures proposed mitigates at least one risk scenario identified)							
<b>Milestone # 2</b>		To be developed							
<b>Milestone # 3</b>		To be developed							

Risk	No risk is estimated yet				
Evaluation	Nothing to evaluate yet				

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.4.2	Non-Functional	Security	Organizational Systems	MUST	WP4 T4.3 / WP3 T3.5				
<b>Title</b>		Blockchain (BC) will avoid the number of data transfers to unauthorized parties							
<b>Assigned Partner</b>		UPV / EVR/ IBM							
<b>Description</b>									
BC for data governance will ensure that data exchange occurs only between authorized partners according to the governance rules enforced by smart contracts.									
<b>Execution Plan</b>									
To fulfil this KPI, specific test cases will be defined, to ensure that absolutely does not exist any data transfer to any unauthorised party.									
<b>Milestone # 1</b>	-								
<b>Milestone # 2</b>	M24	Initial measurement (Review that governance rules, when testing some cases, exchange data only when necessary and authorized)							
<b>Milestone # 3</b>	M36	Final Measurement (Review that governance rules, when testing final defined cases, exchange data only when necessary and authorized)							
<b>Risk</b>		Not available digital reporting							
<b>Evaluation</b>		Nothing evaluated yet							

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.4.3	Non-Functional	Security	Organizational Systems	MUST	WP4 T4.2, T4.3 / WP3 T3.5				
<b>Title</b>		BC will avoid the number of data leakage.							
<b>Assigned Partner</b>		UPV / EVR/ IBM							
<b>Description</b>									
BC ensures that data arrives only to authorized parties and gives full provenance in case of dispute.									
<b>Execution Plan</b>									
To fulfil this KPI, specific test cases considering the security measures deployed, will be defined to ensure that the risk of data leakage is minimized to maximum, considering that a cybersecurity risk cannot be mitigated totally.									
<b>Milestone # 1</b>									
<b>Milestone # 2</b>	M24	Initial measurement (Review that generated reports, when testing some cases, includes only information authorized for each third party)							
<b>Milestone # 3</b>	M36	Final Measurement (Review that generated reports, when testing final cases, includes only information authorized for each third party)							
<b>Risk</b>		Not available digital reporting							
<b>Evaluation</b>		Nothing evaluated yet							

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.4.4	Non-Functional	Security	Organizational Systems	MUST	WP4 T4.2, T4.3 / WP3 T3.5				
<b>Title</b>		BC will increase the amount of shared data among parties of the port business network							
<b>Assigned Partner</b>		UPV / EVR/ IBM							
<b>Description</b>									
BC for shared data enables the share of data in a secured and trusted manner									
<b>Execution Plan</b>									
To fulfil this KPI, specific test cases considering the security measures deployed, will be defined to ensure that shared data among different parties is securely transmitted and processed, considering different milestones and therefore, platform status.									
<b>Milestone # 1</b>									
<b>Milestone # 2</b>	M24	Initial measurement (Review that generated reports, when testing some cases, includes secured information and therefore, the sharing of information is secured and trusted)							
<b>Milestone # 3</b>	M36	Final Measurement(Review that generated reports, when testing final cases, includes secured information and therefore, the sharing of information is secured and trusted)							
<b>Risk</b>		Not available digital reporting							
<b>Evaluation</b>		Nothing to evaluate yet							

## 4.2.5 WP5 Impact KPIs

This category contains Impact KPIs related to the demonstration and the benefits of the proposed data-driven platform through Valencia and Thessaloniki port pilots and the global use case. Addresses traffic improvements, environmental conditions and measures performance with respect to business results of the pilots, according to the identified KPIs.

### 4.2.5.1 ThPA-Related KPIs

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.5.T.1	Non-Functional	Compliance	End-Users	MUST	WP5 T5.3				
<b>Title</b>		20% decrease in the CO2 emissions at the gates of the Thessaloniki port							
<b>Assigned Partner</b>		ThPA							
<b>Description</b>									
The data provisioning by internal and external data providers should be focused on improving the environmental footprint of the shipping ports in local communities. Data-driven AI-based services should provide solutions towards the compliance of reduction of environmental impact.									
<b>Execution Plan</b>									
Calculation method: For the calculation of CO2 emissions from trucks there are several models available considering various parameters. One of the main to be considered is the emissions when the truck is idle (loaded/empty). These references will be reviewed and the CO2 emissions of trucks at gates without DataPorts will be calculated and compared with new values using DataPorts.									
<b>Milestone # 1</b>	M24	Initial Measurement - The model to be used will be defined. The current values will be also available							
<b>Milestone # 2</b>	M36	Final Measurement - The final calculation will take place at the end of demonstration period. The values with DataPorts will be collected.							

Risk	The target value might be lower				
Evaluation	Nothing to evaluate yet				

ID	Type	Category	Source	Priority	Associated Tasks					
I.6.5.T.2	Non-Functional	Compliance	End-Users	MUST	WP5 T5.3					
Title	At DoA: 25% increase in the overall transportation capacity in the Thessaloniki port Updated: 15-20% decrease of trucks service time									
Assigned Partner	PRO/ThPA									
Description	<p>The DataPorts platform will support the optimization of Truck Appointment System by better exploiting the available slots and reducing the waiting time to be served. Relevant information will be available to authorized and interested parties for better organization of their own resources.</p>									
<b>Execution Plan</b>										
Calculation method: The availability of slots (per specific time periods) and the waiting time of the truck at gates will be collected by TAS. The corresponding values will be calculated without DataPorts (as is value) and compared with the new one using DataPorts										
Milestone # 2	M24	Initial Measurement - The current values will be collected i.e., usability of gates (based on slots) and waiting times								
Milestone # 3	M36	Final Measurement- The final calculation will take place at the end of demonstration period. The values with DataPorts will be collected.								
Risk	The target value might be lower									
Evaluation	Nothing to evaluate yet									

ID	Type	Category	Source	Priority	Associated Tasks					
I.6.5.T.3	Non-Functional	Performance Efficiency	End-Users	MUST	WP5 - T5.3					
Title	Improvements of the traffic conditions inside the port and in its area of influence									
Assigned Partner	PRO/ThPA									
Description	<p>Mobility of the population (passengers, cars, trucks) might be proven to be a useful information for route optimization within the city near the port and more specifically, in areas closer to the shipping ports. If such data are combined with the passengers' embarkation and disembarkation, and the ships' schedules would potentially decrease inefficient traffic that might also lead to decrease of city pollution.</p>									
<b>Execution Plan</b>										
Calculation method: A questionnaire will be developed and circulated to port community to evaluate the traffic conditions inside the port and its area of influence. This qualitative approach will support the evaluation of DataPorts intervention										
Milestone # 1	M36	Final Stage Measurements - Completion of the questionnaire by 10 representatives of port community								
Risk	No risk is expected									
Evaluation	Nothing to evaluate yet									

ID	Type	Category	Source	Priority	Associated Tasks
I.6.5.T.4	Non-Functional	Performance Efficiency	End-Users	MUST	WP5 - T5.3
<b>Title</b>		20% increase of operational effectiveness of ThPA community			
<b>Assigned Partner</b>		PRO / ThPA			
<b>Description</b>		<p>Mobility data with approaching to port assistance, along with routing optimization, will improve cargo and container transport operations. This will result to a reduction of unnecessary container transfers, to more secured operations, and on the other hand will improve the efficiency of operations, increase the cost cutting and increase revenues. Monetization opportunities that will be brought by emerging data-driven business models.</p>			
<b>Execution Plan</b>		<p>Calculation method: A set of indicators will be defined in order to calculate the operational efficiency. The values will be calculated without and with DataPorts system.</p>			
<b>Milestone # 2</b>	<b>M24</b>	Initial Measurement - Definition of indicators and availability of values			
<b>Milestone # 3</b>	<b>M36</b>	Final Measurement - The final calculation will take place at the end of demonstration period. The values with DataPorts will be collected.			
<b>Risk</b>		The target value might be lower			
<b>Evaluation</b>		Nothing to evaluate yet			

#### 4.2.5.2 VPF-Related KPIs

ID	Type	Category	Source	Priority	Associated Tasks
I.6.5.V.4	Non-Functional	Functionality	End-Users	SHOULD	WP5 T5.2, T5.3, T5.4
<b>Title</b>		Improved knowledge of hazards of the freights during sea routes			
<b>Assigned Partner</b>		TRX/VPF			
<b>Description</b>		<p>A fully functional data platform will lead to an adoption by many users. It should offer a well governed data products and services, with an easy access and delivery mechanisms. Within the offered benefits lies their abilities to give end-users a cohesive view of data from multiple sources and make data available to those users with proper permissions. Data products and services through data platform should provide access to the right data at the right time, when are requested and at the requested accuracy. By being able to fulfil end-users' needs, it will increase the value of the data. Since data-driven platforms and the offering of data are relatively new services, advanced security and authentication tools and mechanisms must be applied and ensure the proper access and easily keep track of who can access data via the platform. Including datasets that were not easily accessed so far will create an increasing need for additional datasets and promote others to offers their data as well.</p> <p>The Platform should allow increase of datasets not only by internal data owners/providers but also by external ones who are willing to be engaged in this data-driven ecosystem, offering and receiving data, services and eventually valuable information for their companies.</p> <p>Being able data owners to provide datasets that are of actual need will increase the request for them as well as their volume and frequency. Freight-related data should ensure the safety of the transported freights and optimize their route.</p>			
<b>Execution Plan</b>		<p>Smart containers can communicate periodically the GPS positions of the container enabling the stakeholders to compute the exact route of the container. In addition, using other sources of data such traffic and weather and when data science is applied, one can compute few alternatives and enhance route planning accordingly. Collaboration will be established with BCOs, and IoT devices will be placed in containers to collect data.</p>			

<b>Milestone # 1</b>	<b>M12-M18</b>	Equip containers with IoT devices
<b>Milestone # 2</b>	<b>M24</b>	Sign a contract with BCOs that is willing to flag its containers with dangerous freights
<b>Milestone # 3</b>	<b>M36</b>	BCOs will flag the container with dangerous freights and communicate that to the IoT providers
<b>Risk</b>		The willingness of BCOs to share data
<b>Evaluation</b>		Nothing to evaluate yet

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.5.V.5	Non-Functional	Performance Efficiency	End-Users	SHOULD	WP5 T5.2, T5.3, T5.4				
<b>Title</b>		Decrease of wrong or inefficient routes detection as part of the overall route optimization							
<b>Assigned Partner</b>		TRX/VPF							
<b>Description</b>		Mobility of the population (passengers, cars, trucks) might be proven to be a useful information for route optimization within the city near the port and more specifically, in areas closer to the shipping ports. If such data are combined with the passengers' embarkation and disembarkation, and the ships' schedules would potentially decrease inefficient traffic that might also lead to decrease of city pollution.							
<b>Execution Plan</b>									
Execution, similar to I.6.5.V.4									
<b>Milestone # 1</b>	<b>M18</b>	Equip containers with IoT devices							
<b>Milestone # 2</b>	<b>M24</b>	Sign a contract with BCOs that are willing to use the data to optimize their route planning							
<b>Milestone # 3</b>	<b>M36</b>	BCOs will test different routes and compare them							
<b>Risk</b>		The willingness of BCOs to share data							
<b>Evaluation</b>		Nothing to evaluate yet							

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.5.V.6	Non-Functional	Performance Efficiency	End-Users	SHOULD	WP5 T5.2, T5.3, T5.4				
<b>Title</b>		Decrease of accidents/disputes around container crashes							
<b>Assigned Partner</b>		TRX/VPF							
<b>Description</b>		Mobility data with approaching to port assistance, along with routing optimization will improve cargo and container transport operations. This will result to a reduction of unnecessary container transfers, to more secured operations, and on the other hand will improve the efficiency of operations, increase the cost cutting and increase revenues. Moreover, performance efficiency in the operations will lead to increase of socio-economic impact to the local community (region, commercial associations, etc.) and offer additional monetization opportunities that will be brought by emerging data-driven business models.							
<b>Execution Plan</b>									
Smart containers can communicate the shocks undergone by the container; any breaches including unexpected door opening with clear indication on where and when that shock happened. Execution, similar to I.6.5.V.4									

<b>Milestone # 1</b>	M18	Equip containers with IoT devices
<b>Milestone # 2</b>	M24	Sign a contract with BCOs that are willing to use the data to optimize their processes related to container crashes.
<b>Milestone # 3</b>	M36	BCOs will collect the data and grant access to the relevant stakeholders that should redefine their process to take that information in account in their operations.
<b>Risk</b>		The willingness of BCOs to share data
<b>Evaluation</b>		Nothing to evaluate yet

ID	Type	Category	Source	Priority	Associated Tasks
I.6.5.V.7	Non-Functional	Performance Efficiency	End-Users	SHOULD	WP5 T5.2, T5.3, T5.4
<b>Title</b>	Reduction of transport and logistic costs per box and per kilo				
<b>Assigned Partner</b>	TRX/VPF				
<b>Description</b>					
Similar as I.6.5.V.6					
<b>Execution Plan</b>					
Smart containers support enhanced decision-making by stakeholders by providing a common base to achieve near real-time shared visibility across the entire door-to-door trip execution.					
<b>Milestone # 1</b>	M18	Equip containers with IoT devices			
<b>Milestone # 2</b>	M24	Sign a contract with BCOs that are willing to use the data to optimize their supply chain			
<b>Milestone # 3</b>	M36	BCOs will conduct a case study on the impact of smart container on their lead-time and D&D bills as two main measurements able to reduce the cost for a given item			
<b>Risk</b>		The willingness of BCOs to share data			
<b>Evaluation</b>		Nothing to evaluate yet			

ID	Type	Category	Source	Priority	Associated Tasks
I.6.5.V.8	Non-Functional	Performance Efficiency	End-Users	SHOULD	WP5 / T5.2, T5.3, T5.4
<b>Title</b>	Reduction of steal and intrusion risk in high-value containers				
<b>Assigned Partner</b>	TRX/VPF				
<b>Description</b>					
Similar as I.6.5.V.6					
<b>Execution Plan</b>					
Smart containers enable to delineate the responsibilities of each actor of the supply chain.					
<b>Milestone # 1</b>	M18	Equip containers with IoT devices			
<b>Milestone # 2</b>	M24	Sign a contract with BCOs that are willing to use the data			
<b>Milestone # 3</b>	M36	BCOs will measure the number of intrusions in average of smart containers versus regular containers			
<b>Risk</b>		The willingness of BCOs to share data			

Evaluation	Nothing to evaluate yet
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ID	Type	Category	Source	Priority	Associated Tasks				
I.6.5.V.9	Non-Functional	Performance Efficiency	End-Users	SHOULD	WP5 / T5.2, T5.3, T5.4				
Title	Improvement of berthing/un-berthing smart container operations								
Assigned Partner	TRX/VPF								
Description	The objective is to improve container tracking operations.								
Execution Plan	Enable terminal operators to verify the exact location of each container in their yard in real time, advice of mishandling or equipment failures, and assist in locating dangerous goods to enhance safety.								
Milestone # 1	M18	Equip containers with IoT devices							
Milestone # 2	M24	Sign a contract with BCOs that are willing to share their data with terminal crew							
Milestone # 3	M36	Inland and sea terminal operators are willing to share the impact of the smart container data availability							
Risk	The willingness of BCOs to share data								
Evaluation	Nothing to evaluate yet								

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.5.V.10	Non-Functional	Performance Efficiency	End-Users	SHOULD	WP5 / T5.2, T5.3, T5.4				
Title	Improvement of the last-mile operations in logistics								
Assigned Partner	TRX/VPF								
Description	Proposed new AI-enhanced digital services, should be used to optimize the shipping port resource management and optimize the operations. Best practices may be used to other ports, especially to those that are operated by the same Port Authority. An effort should be given to on-board data collected from logistic companies related to the port. An attempt towards that, should be given to influence through the offered benefits and attract additional end-users that will enrich the operational productivity and the performance efficiency of the shipping ports and the offered services.								
Execution Plan	Smart containers can communicate periodically the GPS positions of the container enabling the stakeholders to compute a better ETA which allows a better last mileages planning.								
Milestone # 1	M18	Equip containers with IoT devices							
Milestone # 2	M24	BCOs will collect the data, equip the terminals and vessels with Gateway Networks and implement mobile applications enabling the different stakeholders to access the reefer data remotely							
Milestone # 3	M36	Inland and sea terminal operators are willing to share the impact of the smart container data availability							
Risk	The willingness of BCOs to share data								
Evaluation	Nothing to evaluate yet								

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.5.V.11	Non-Functional	Performance Efficiency	End-Users	SHOULD	WP5 T5.2, T5.3, T5.4				
<b>Title</b>		Reduction of the cold chain risks							
<b>Assigned Partner</b>		TRX/VPF							
<b>Description</b>		Proposed new AI-enhanced digital services, should be used to optimize the shipping port resource management and optimize the operations. Best practices may be used to other ports, especially to those that are operated by the same Port Authority. An effort should be given to on-board data collected from logistic companies related to the port. An attempt towards that, should be given to influence through the offered benefits and attract additional end-users that will enrich the operational productivity and the performance efficiency of the shipping ports and the offered services.							
<b>Execution Plan</b>									
Smart containers can communicate the sensors' measurements and alerts coming from a reefer controller units and enable the vessel crew and terminal operators to get the information remotely and focus on reefers rising alerts or disfunctioning.									
Milestone # 1	M18	Equip containers with IoT devices							
Milestone # 2	M24	Sign a contract with BCOs that are willing to use the data to optimize their operations							
Milestone # 3	M36	BCOs will collect the data, equip the terminals and vessels with Gateway Networks and implement mobile applications enabling the different stakeholders to access the reefer data remotely							
<b>Risk</b>		The willingness of BCOs to share data							
<b>Evaluation</b>		Nothing to evaluate yet							

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.5.V.12	Non-Functional	Performance Efficiency	End-Users	SHOULD	WP5 / T5.2, T5.3, T5.4				
<b>Title</b>		Increase in landside operations efficiency (boxes/hour) concerning smart containers							
<b>Assigned Partner</b>		TRX/VPF							
<b>Description</b>		The objective is to increase the landside operations with respect to cargo handling.							
<b>Execution Plan</b>									
Smart containers support enhanced decision-making by stakeholders by providing a common base to achieve near real-time shared visibility across the entire door-to-door trip execution.									
Milestone # 1	M18	Equip containers with IoT devices							
Milestone # 2	M24	Sign a contract with BCOs that are willing to use the data to optimize their landside operations							
Milestone # 3	M36	BCOs will measure landside operations efficiency (boxes/hour) concerning smart containers versus regular containers							
<b>Risk</b>		The willingness of BCOs to share data							
<b>Evaluation</b>		Nothing to evaluate yet							

#### 4.2.5.3 Global Use Case -Related KPIs

ID	Type	Category	Source	Priority	Associated Tasks

I.6.5.G.6	Non-Functional	Usability	End-Users	MUST	WP5 T5.2, T5.3, T5.4 / WP7				
<b>Title</b>		Increase data from Posidonia Port Solutions products available to other organizations							
<b>Assigned Partner</b>		PRO							
<b>Description</b>									
As a result of the port management system integration and so the increase of available data sources, more data would be provided to the platform that may have other stakeholders besides of the Port Authorities.									
<b>Execution Plan</b>									
The Posidonia data sources will be integrated in the DataPorts platform through the implementation of agents and the modification of the Posidonia products to share the data.									
Milestone # 1	M36	Data is shared from integrated Posidonia products and available to be consumed under the defined access rules							
<b>Risk</b>		The willingness of 3 <sup>rd</sup> parties to share data							
<b>Evaluation</b>		Nothing to evaluate yet							

ID	Type	Category	Source	Priority	Associated Tasks				
I.6.5.G.7	Non-Functional	Usability	End-Users	MUST	WP5 T5.2, T5.3, T5.4 / WP3				
<b>Title</b>		Integration of Posidonia Port Management System with DataPorts available data sources							
<b>Assigned Partner</b>		PRO							
<b>Description</b>									
The integration of the DataPorts platform with Posidonia port management system implies that future data sources may be integrated with other products applying similar processes or mechanisms such as builder agents.									
<b>Execution Plan</b>									
An automated mechanism as is an agent will be developed, in order to set up a process by which Posidonia management system will be integrated with DataPorts platform. This will define a template for future integrations.									
Milestone # 2	M18	Initial Measurement - Build an agent for a Posidonia product using a provided template. Measure the cost in terms of time and effort.							
Milestone # 3	M36	Final Measurement - Measure the cost in terms of time and effort.							
<b>Risk</b>		The willingness of third parties to share data							
<b>Evaluation</b>		Nothing to evaluate yet							

ID	Type	Category	Source	Priority	Associated Tasks
I.6.5.G.8	Non-Functional	Scalability	End-Users	MUST	WP5 T5.2, T5.3, T5.4 / WP3
<b>Title</b>		Number of Posidonia Port Solutions products integrated			
<b>Assigned Partner</b>		PRO			
<b>Description</b>					

The Posidonia port management system integration process aims to increase the available data sources not only for the platform but also for both pilot ports.

#### Execution Plan

Build the agents for the Posidonia data sources and integrate them with the DataPorts platform. Deploy one Posidonia product in each of the pilots. Posidonia products will be deployed in the pilot ecosystems.

Milestone # 1	M18	Define the deployment process in the pilot ecosystems							
Milestone # 2	M36	Posidonia data sources integrated in each port pilot, more agents are developed and process is evaluated.							
Risk	The willingness of third parties to share data								
Evaluation	Nothing to evaluate yet								

ID	Type	Category	Source	Priority	Associated Tasks					
I.6.5.G.9	Non-Functional	Portability	End-Users	MUST	WP5 T5.4 / WP3					
Title	Integration easiness of the platform with Posidonia Port Solutions and with other deployments									
Assigned Partner	PRO									
Description	The integration of the platform with the port management system implies that integrations by other ports will be easier because of the reusability of the platform components.									
<b>Execution Plan</b>										
A first integration of a Posidonia product will be done for one of the pilots. Then this integration will be repeated in other port ecosystem, like the other pilot or port where the same product is deployed.										
Milestone # 2	M18	Measure the cost of the integration of a Posidonia product with the platform, in terms of effort and time, for the first time.								
Milestone # 3	M36	Measure the cost of the integration of a Posidonia product with the platform, in terms of effort and time, in another port and using the already built agents as templates.								
Risk	The willingness of third parties to share data									
Evaluation	Nothing to evaluate yet									

ID	Type	Category	Source	Priority	Associated Tasks
I.6.5.G.10	Non-Functional	Performance Efficiency	End-Users	SHOULD	WP5 T5.2, T5.3, T5.4 / WP3
Title	Data fusion of the same asset from different sources				
Assigned Partner	PRO				
Description	The integration of the platform with all the available data sources implies that more data is available for the Port Authorities and other organizations. This data may be about entities that are already shared from other data sources. All data of the same entity from different sources should be unified and shared as a unique object.				

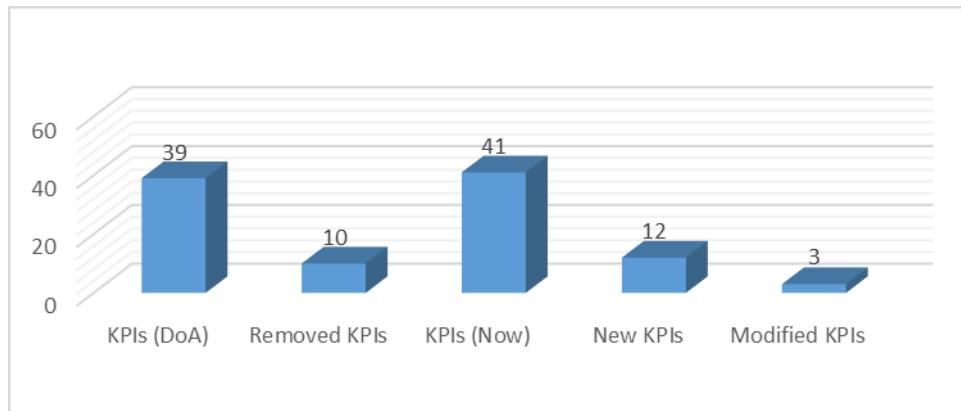
Execution Plan	
First the data must be shared with the platform, transformed into the common ontology. Then the Distributed Authoring and Versioning (DAV) component will merge this data when data for the same entity is shared from different data sources or processes.	
Milestone # 2	M24– M30
Milestone # 3	M36
Risk	The willingness of third parties to share data
Evaluation	Nothing to evaluate yet

ID	Type	Category	Source	Priority	Associated Tasks					
I.6.5.G.11	Non-Functional	Usability	End-Users	MUST	WP5 T5.2, T5.3, T5.4 / WP7					
Title	Engage final clients in DataPorts and Posidonia Port Solutions products									
Assigned Partner	PRO									
<b>Description</b>										
The integration and deployment of the platform within the pilot ports means having new ways both to share and to consume data. This means that new stakeholders may be interested in the integration with the platform. The pilot must engage final clients (VPF and ThPA) in order to not only include new data from providers (PRO, TRX) into the platform but to use this data in at least one use case.										
<b>Execution Plan</b>										
The global use cases of PRO and TRX will provide additional data for both pilots, VPF and THPA. This requires that Posidonia and other sensors are deployed in the port ecosystems, so they could share this data. This data should be consumed by both port authorities as new stakeholders. Hence, sensors will be installed in third parties' assets (containers) and additional data will be collected. Data will be deployed in Posidonia and will be provided to the port pilots.										
Milestone # 1	M18	TRX sensors are installed in the expected assets								
Milestone # 2	M24	Posidonia is deployed in the pilots' port ecosystem								
Milestone # 3	M36	Shared data from the deployed Posidonia product is consumed by final clients (VPF, ThPA)								
Risk	The willingness of third parties to share data									
Evaluation	Nothing to evaluate yet									

WP6 and WP7 packages contain KPIs that are mostly related with exploitation and dissemination activities, hence are presented and monitored within the content of D6.1 [M6] and D6.2 [M12].

#### 4.3 KPI MODIFICATIONS

From the course of Dataports so far and the analysis of the Impact requirements and the redefinition of the goals, it was deemed necessary to change the Impact KPIs described in DoA, in order to be more realistic and feasible. For this reason new KPIs are proposed which are in line with the objectives of the project. At the same time, 3 Impact KPIs were redefined, while 10 KPIs were deemed necessary to be deleted because they would not be measurable within the duration of the project. Figure 4 depicts those statistics.



**Figure 4 Impact KPI Statistics**

More specifically, Table 3, describes those Impact KPIs that were documented in DoA and have been chosen to be removed since from the initial investigation such Impact KPIs cannot be measured during the project and therefore new ones should be proposed in the revision of this deliverable.

ID	Type	Category	Description	Reason
I.6.2.6	Non-Functional	Performance Efficiency	10% reduction in container operations' costs in the Valencia port	The operations' costs can be only reduced if we apply the DataPorts platform in a real environment with all the transport companies involved. During the project will be used real-time data but without the haulier companies involved, so this KPI cannot be measured during the project development.
I.6.5.G.1			Reduction of traffic and noise impact in port cities	These KPIs are currently out of the pilot / project scope because to accomplish their conditions, concrete data should be included in a use case and provided by the Posidonia Port Solution that can share this kind of data.
I.6.5.G.2			Improvement of the operational productivity in port management	
I.6.5.G.3			Reduction of delays in the port management integration	
I.6.5.G.4			Reduction of conflicts in scenarios shared by the same Port Authority	
I.6.5.G.5			Reduction of overall transport costs (per box and per kilo)	Currently there is not a Posidonia product in any of the pilot ports.
I.6.5.G.12			Reduction of conflicts in scenarios shared by the same Port Authority	
I.6.5.V.1			<u>20% reduction in the turn-around time of trucks in the Valencia port</u>	The turn-around time can be only reduced if we apply the DataPorts platform in a real environment with all the transport companies involved. During the project will be used real-time data but without the haulier companies involved. Therefore, this KPI cannot be measured in the scope of the project.
I.6.5.V.2			<u>10% increase in the number of trucks with documentation ready at</u>	The documentation availability can be only improved if we apply the DataPorts platform in a real environment with all the transport companies involved. During the

ID	Type	Category	Description	Reason
	I.6.5.V.3		<u>terminal arrival in the Valencia port</u>	project will be used real-time data but without the haulier companies involved. Therefore, this KPI cannot be measured in the scope of the project.
			Reduction of environmental impact	The Blue Growth initiative in European level is the long-term strategy to ensure the sustainable development of maritime and shipping sector. Promoting smart and sustainable development opportunities in the European maritime economy through the preservation and the protection of the environment will preserve the local ecosystems. This KPIs is currently out of the pilot / project scope because to accomplish their conditions, concrete data that is not available should be included in a use case and provided by the Posidonia Port Solution. Hence, this information cannot be measured in the project duration.

Table 3 Impact KPI Removals from DoA

#### 4.4 KPI MONITORING AND ASSESSMENT

KPIs' progress monitoring is about capturing data from measurements that are collected according to the execution plan of each KPI and assessing them to meet specific goals and objectives that will be presented in a KPI Assessment excel tool.

The monitoring of each KPI will be obtained in a KPI Assessment excel dashboard and will be reported on an annual basis within the context of D6.3 [M24], [M36]. It will provide an at-a-glance view of the progress, to have a better picture on how the entire DataPorts Impact is doing.

The excel dashboard will include the associated WP and Tasks, the execution plan, the business rationale, the initial and the updated milestones, the impact category, the priority, the assigned partner if it is necessary and the Key risk indicator (KRI) on how risky an activity is.

KPI monitoring and assessment is about analysing and evaluating the measurements of the KPIs in order to meet the objectives. Continuous analysis of each KPI, resides in the quality of the data (measurements) and the roadmap that is set for the KPI's fulfilment. The analysis of the measurements, will depict the impact of DataPorts in seaport's ecosystem, measuring its adoption at EU level, and based on the measurements (available data) estimating what needs to be modified to accomplish each objective.

The impact analysis of the DataPorts KPI will be evaluated based on the dependencies of its technological components, on evaluating results with their previous conditions and the overall operational and financial impacts and the disruption the newly introduces platform to the seaport community.

As DataPorts is still a new concept as is the idea of a data-driven platform that will enhance business opportunities in the seaport ecosystem, there is a lack of available information on the actual impact

Proposed data-driven services and a wide range of available datasets aim to transform the seaports and create a smart ecosystem. In many cases it will be attempted to on-board into the proposed platform stakeholders that until today they were not included in a seaport ecosystem. Pilot Ports will be the frontline towards the adoption of the DataPorts platform by the new ecosystem's actors.

#### 4.5 RISKS

Among the risks related to the Impact KPIs may be considered the difficulties on measurements according to the proposed execution plans. Such difficulties may be internal, that are related to the implementation of DataPorts platform components as well as, those that are related to other external phenomena, non-related

to the project. For each Impact KPI there is a risk indicator as presented on each Impact KPI's table on section (4.2 Execution P). This indicator affects the progress and the fulfilment of each KPI, and it will be changed accordingly in order to be in compliance with the evaluation value. At this phase the risks are defined at a very high level since their execution have not started yet. During the KPIs' execution it is expected to present more realistic risks.

Since all Impact KPIs are associated to WPs and Tasks which have apparently other dependencies as well, attention must be paid to monitoring and execution phases, in order KPIs to reach their fulfilment phase.

Moreover, due to the existing covid-19 pandemic, several actions that were planned to be taken may be forced either to be delayed, use other approaches or cancelled. Such cases may affect the pilots' execution and therefore the KPIs' fulfilment. Hence, immediate actions will be taken accordingly.

## 5 OUTREACH ACTIVITIES

### 5.1 ECOSYSTEM

By making a seaport smart, the AI-based services will offer cognitive services that will provide opportunities to Port owners, visitors, customers, etc. Port Authorities may take the advantage by creating synergies with research community, data owners and providers, software-houses, start-ups and SMEs to, together create new innovative services and expand the list of the potential beneficiaries. Under this scope, the above-mentioned actors can have the role of data provider, data consumer, or even the role of the data prosumer in which an actor can share and consume data to the ecosystem.

Within the scope of the outreach activities is to reach to those companies, inform them about the vision and the objectives of DataPorts and initiate discussions to form collaborations for future exploitation activities. Besides the dissemination activities that were proposed in D6.1, surveys may be also used as an information tool and to “attract” as many potential beneficiaries as possible.

### 5.2 COLLABORATION WITH OTHER EXTERNAL STAKEHOLDERS

Establishing various forms of collaboration with external stakeholder, will increase the adaptation rate of DataPorts platform by them. Different approaching procedures regarding this were introduced in D6.1. Under this scope, surveys are not only a feedback mechanism but also a medium for promoting DataPorts activities.

Several Impact KPIs require input from external sources (third parties) to be fulfilled. Hence, necessary actions in terms of communication activities will be obtained. Part of the communication activities are those with start-ups and SMEs which are considered as innovators (KPI I.6.5) considering services related to seaports, other H2020 projects (e.g. Smartships, PortForward) which discussions have been already established, as well as by getting in contact and discuss the possibility of collaboration with associations (Ammitec- Association of Maritime Managers for Information Technology and Communications) that are dedicated to shipping and maritime communities. A detailed plan and actions conducted or planned will be presented later in the project within the context of deliverable D6.4.

### 5.3 SURVEYS

As it was depicted in D6.1 [M6], in order to know whether the project meets the needs of the target groups, DataPorts uses different approaches to measure the adoption by the ecosystem stakeholders and suggest adjustments if needed.

A major tool to be used is to run interviews and surveys to identify specific service needs and at the same time be informative regarding the goal of the project. The proposed surveys presented in Table 4 should have clear scope. They will be designed and in such a way to measure the success of DataPorts impact to the Ports Ecosystem. For that reason, the surveys should follow the following principles:

- to have a clear purpose,
- to be understood by the target groups,
- to produce accurate data for decision-making,
- and a well-organized list of participants.

The surveys permit participants to consider their responses carefully and allows feedback from a large number of people simultaneously. Questions can address a large number of issues and concerns efficiently, with an increased possibility of a high response rate and assist in the interpretation and the analysis of the results. Moreover, surveys permits anonymity which is an element that increases the rate of response.

By following the above-mentioned strategy, should be avoided the weak motivation of participants to respond, the complexity that could lead a badly designed questionnaire, the unsuitable method of replies evaluation, and the poor quality of gathered data.

The surveys need to be created well in advance, in order to achieve the above mentioned scopes. Since the results will be published in M12, M24 and M36 Reports, the preparation of each one should follow a specific timeline. Therefore, based on the progress results, future surveys may be modified to be compatible with the needs of DataPorts. The running periods of the proposed surveys may be changed due to the level of the progress of DataPorts platform and the integration of the tools.

1. Preparation of Survey: Organize Questions, UI, etc. (1 Month)
2. Run the Survey: Each partner will send the survey link to responders (partners, clients, etc.) (1 Month)
3. Survey Results: Gather responses, analyse results, input to the upcoming Report of impact and outreach activities (1 Month)

Surveys	Title	Target Group	Running period	Deliverable	Publish
Survey 1	Identify the needs of data and services in a Port Community	Research groups, potential stakeholders	M10 – M11	D6.3	M12
Survey 2	Measure the benefits and the impact from a data-platform usage	Research groups, potential stakeholders	M20 – M22	D6.3	M24
Survey 3	Data-platform Evaluation. Benefits and Lessons Learnt	Research groups, potential stakeholders	M30 – M33	D6.3	M36
OTE (Internal Ideation)	Internal Ideation Platform of OTE (May be used to run a campaign for ideas collection proposing innovative services to be considered by DataPorts.	IT & ICT Sales employees of OTE (~ 50-100 invitations)	Y2-Y3	D6.3	M36

**Table 4 Survey Plan (Originally presented in D6.1)**

Through the annually conducted surveys, the impact of the DataPorts activities will be dependent in high degree by the results extracted from the surveys. The responses collected from the surveys will offer valuable insights for DataPorts. They will also be a valuable source to measure the actual impact of the designed data platform, at different implementation stages and through this evaluation, give valuable insights in terms of data-platform's functionality and its usage.

The surveys will take place in three different phases of the project and follow the requirements and the platform implementation stages. The targeted responders may be businesses and individuals that are currently related to the seaport's community but will make an effort to have responses from private and public bodies that potentially may benefit from their involvement with the shipping ports.

### 5.3.1 Survey #1

The scope of this questionnaire (available in Annex #1) is to identify the needs of known or unknown (potential) stakeholders in the shipping port's ecosystem. The responses will inform future proposals and allow us to create new datasets or AI-based cognitive services directly catered to the stakeholders' needs.

A brief description of DataPorts was given within the invitation mail in order responder to be familiar with the concept of DataPorts.

#### 5.3.1.1 Methodology

It is asked to respond anyone interested to see how collaboration can foster innovation within their organisation and anyone that wants to be inspired from the following list: Startups, SMEs, Large Industries,

Shipping Companies, Public Authorities, Forwarders and Shippers, Ship Agents, Terminal Operators, Surveyors, Transport Operators, Software Developers, Researchers, LEAs, etc.

The survey is divided into several categories, to, analyse the results efficiently. The survey contains closed-ended questions with a predefined list of answers and open-ended questions where the respondent is asked to clarify the given answer. Table 5 presents the categories that are included in the survey.

General	Platforms Experience	Platform Usage	Security & Data Protection	DataPorts Platform Exploitation	Data Profile	Data Platform Adoption
•to collect business demographic insights.	•to have a knowledge on previous experience of the responders	•to understand the pains and gains of a previous use of similar platform	•to understand the main concerns with respect to security and the new normals	•to have a clear view of the expectations of the users	•to identify the needs for specific data sources and services	•to identify the exploitation target audiences

Table 5 Survey Question Categories

### 5.3.1.2 Execution

The survey was conducted between Oct. 1st and Nov. 6<sup>th</sup> and numerous of participants were invited by all partners. The purpose was to collect responses from key players in seaports' ecosystem and from various fields of operations that potentially be part of this dynamically emerging market. Within the running period, 91 responses collected by related to seaports organizations and individuals.

### 5.3.1.3 Survey Analysis

#### Key Finding [General Section]

As it can be observed in (Figure 10), (Figure 11), and (Figure 12), the responses collected come from a wide variety of experts representing different sized companies with a wide diversity of operating fields. More specifically, 52,7% of the responders come from large-type organisations which are companies with a wide range of specialisation among their employees, while 23,1% represent Medium sized organisations, with similar characteristics but perhaps more sectorial expertise in specific areas of interest. Many of them already operate in seaports ecosystem. The 17,6% of the responders are small sized enterprises such as start-ups that operate or have an interest to be involved in such an emerging data-driven market. This pluralism ensures the validity and the accuracy of the collected information.

A wide variety of the responses can also be depicted at (Figure 11) where although the majority 75% of the responses come mainly from Shipping/maritime, academia, telecommunications and ICT service organisations as it was expected, there is a 25% that comes from other industries, public bodies software houses, network operators, marketing, transportation and consulting enterprises that shows a potential interest of participation at the seaports' ecosystem and their transformation.

The wide variety of responders with respect to their specialisation is supported by data shown in (Figure 12). As it was expected the top 27% come from IT specialists since those will be the ones to actually handle and process all the necessary actions together with the Technical Engineers 13%. What is remarkable is the participation and feedback provided by Management-related responders 19%, marketing 8% and consultants 11% that ensures not only the interest but also the understanding of the seaport's transformation and the benefits their organisations may have from their engagement. There is also a research related 15% that represents an active community, and which is very promising for the introduction of new services.

Concluding with this category, it seems that there is extreme interest on data-driven offerings in the fast-emerging shipping/maritime community, as is the consideration and the intention of third parties that until now were out of the seaport's radar for collaboration.

#### Key Finding [Platforms Experience Section]

The replies given in this category, and presented in (Figure 13), show a rough balance between those organisations that haven't any past experience 44% with data-driven platforms and those who had a previous

experience 56%. This balance cannot produce accurate conclusions when the responders were asked to evaluate their experience with several platforms. Data depicted in (Figure 14) and (Figure 15) show that there is a wide differentiation on the evaluation between the responders regarding the commonly known and used data-driven platforms. It seems that the responses' sample was rather small to extract solid and accurate conclusions. Analysing in depth the results depict that the responders had in many cases no previous experience with all the available to rate platforms and therefore safe conclusions cannot be extracted at this point. Based on the diversity of the fields of operation of the responders and the level of experience they had in the past with such platforms, mixed results were collected.

However, it is supported by the responses that due to the wide variety of data-driven platforms and the numerous parameters that exist, it is rather difficult to have a clear opinion that can be fully compliant with all the data-driven verticals (seaport community in this case). DataPorts platform is intentionally aimed for the shipping/maritime vertical, therefore cannot be put in comparison with well-known data platforms.

It is concluded from data collected in (Figure 16) that from the majority of responses ~80% reported that the most important reasons for terminating the usage of such data-driven platforms was security related issues with 26,4%, the dissatisfaction of service 19% and the rest is divided between other reasons. This information will be cautious investigated by DataPorts.

#### Key Finding [Platform Usage Section]

From the feedback in this category shown in (Figure 17), (Figure 19), and (Figure 20) the organisations have an increased interest to buy services rather than sell data. Similarly, they report their intention to provide and consume data services. It is noticed though a reluctance by some organisations to sell data which is understandable because competition plays an important role and there is always a concern on losing a competitive advantage. The explanation for this finding is mainly business related than a technological reasoning. Nevertheless, it seems that is of extreme importance since 85% of responses that belong to ICT service vendors, shipping/maritime organisations, telecommunication and research centres are willing to both sell and buy data and service.

Considerations are given on competitive advantage and the information that may be revealed from exporting sensitive corporate information. Data collected support that the organisations are more willing to provide and consume services. Services are usually analysed, and valuable insights are produced, and by providing services, sensitive corporate insights may be unrevealed.

Analysing in depth (Figure 18), it is observed that ICT Vendors and Telecommunications are more than willing to sell data with respect to Cargo & Logistics, Shipping and research centres where either they don't produce data, or they have considerations on losing a competitive advantage. Data buyers are reported the ICT vendors, the telecommunications and the research centres since they are willing to provide related services. Moreover, the willingness to consume data services are shipping and ICT organisations, in addition to Telecommunications and research centres. The rest of the responders are reported with minimum input on all four categories.

It is observed from (Figure 19) that organisations have a great interest on passengers' mobility information (28,6%), containers' tracking (35,2%), as well as custom authority data (31,9%) and demographics (31,9%) (GDPR compliance need to be applied). The 2nd important finding as seen in (Figure 20) is interest on seaport's available services, ships' schedules and statistics in general, all in high percentages). This fact actually describes in reality the need for a great variety of service provisioning in the seaport community, especial for services that currently are unavailable or need enhancements. The plurality of available data will increase the demand by the seaport's ecosystem actors.

#### Key Finding [Security and Data Protection Section]

Even though the concept of this survey was to identify the needs for data and services related to the seaport ecosystem, an emphasis was given on security and data protection aspects (Figure 21). More specifically, the security policies that can be applied and the compliance with the regulations have the main impact on them. Additionally, confidentiality and mechanisms that can ensure data leakage protection are also of a great significance. Therefore, a platform should be designed in accordance to these attributes.

(Figure 22) depict the broad variety of problems that many organisations encounter. The survey responders had the ability to select all those that apply to their experiences. It is rather impressive that 75% reported that they did not face any data security/data governance problems in the past. However, trying to analyse the collected feedback it can be concluded that even in small proportions they faced problems similar to system vulnerabilities, data losses or insufficient due diligence, permission less data distribution, data breaches, weak identity, credentials and access management (Figure 23). A rational assumption is that these organisations represent large industries that proactively have taken all the right precautions for their infrastructures / products.

This finding is also verified in (Figure 24) where 71,4% of the organisations use various security systems to protect their data, while the 28,6% do not take any measures. This 71,4% may be considered as those organisations that will potentially increase their revenues through the monetization of their data. However, as it can be observed in (Figure 25), the diversity of the answers come from selective organisations, such as Telecommunications, ICT vendors, research centres and the shipping that are more actively involved in data handling.

The next important finding as it can be seen in (Figure 26) is that 60,4% among the responders process personal information data such as name and location, while the 8,8% processes special categories of personal data. This evidence describes the importance on various analytic services of the personal data. Therefore, various techniques should be applied by the data-driven platforms, in order to be compliant with GDPR and the existing regulatory environment. However, it is also noted that the 30,8% processes non-personal information, but in this category sensitive corporate information are included. Hence, emphasis was given to the data storage mechanisms with 60,4%, and the data collection processes with 72,5%. On the contrary, data retrieval measured 25%, data organization 35,2%, the data structuring 29,7%, the aggregation 34,1%, and the retrieval of the data 24,4% were also interesting findings. All these can be seen at analytically in (Figure 27).

As it was expected, it is of high importance to the majority of the organisations their intention to guarantee data protection principles and be in accordance with the GDPR Article 5 (Figure 28). The strict regulatory environment and the uncertainty of a clear and well measured benefit have caused data providers to be overprotective on data sharing to 3rd parties. Besides the anonymization, authorization and authentication mechanisms that are commonly applied above 50%, additional security control policies were also applied by organisations to ensure the maximum levels of security, minimize the risks and avoid in many cases the loss of their competitive advantage.

#### Key Findings [DataPorts Platform Exploitation Section]

This category was designed to measure the willingness of the responders to take advantage and use a data-sharing platform and adopt it to their business plans. It seems that of highly importance among the answers were the consuming data for safe business conclusions, improving their customers' experience, creating new services based on the insights, and improving their infrastructure. Data supporting this evidence are shown in Figure 29, were feedback in most of the cases was measured ranging between 30 and 50 %. The responders were able to make multiple selections where applied.

The 2nd most important thing in this category, is depicted in (Figure 30) where the feedback of the responders ensured the significant willingness to match the seaports' services through a data driven platform. More specifically, their desire to exploit offered data and services, in order to enrich existing services with new specifications reached 59%, and while the creation of new services based on the

information they will get from the offered data measured at 65%. It is also remarkable from this graph that 38,5% of them expressed their interest to form new partnerships. This high percentage represents the potentiality that seaports transformation have and the need to bring into the frame the use of a dedicated data-driven platform to lead the creation of an enhanced seaports' ecosystem with a wide variety of stakeholders and beneficiaries.

Figure 31 presents the severity of each of various pains/difficulties that the organisations usually experience. Difficulties that are usually related to data or service sharing. Several known difficulties were mentioned such as, customer requirements, selections of service analytics and besides the fact that all these are common problems, the majority of the responders evaluate them as medium-sized pains and not as extreme pains as was expected. The customers' requirements knowledge was recognized by all responders coming from shipping and cargo organisations, as well as from Telecommunications, ICT and research centres as important pain experience, while the fluctuation in customers' requirements over time were recognized as pains mainly in shipping organisations and the research centres. However, a less painful difficulty was reported the selection of analytic services. On the contrary, the level of QoS agreed with their consumers was considered as a rather extreme pain for them. Data supporting this are shown in (Figure 32).

The frequency and the intention of organizations to buy data, was identified in (Figure 33) which portrays that 45% of the responders buy data from time to time, while 31% need unlimited access to specific data sources and only the 12% have a regular process to support it. Only 3% of the responders do not buy or have no interest to buy data. Analysing this figure, it is depicted that 32% of the organisations that have bought or are willing to buy data one time comes from Universities and research centres, as well as from the shipping and maritime industry. In the 1<sup>st</sup> case the need is to have a dataset for testing and validating purposes, while the 2<sup>nd</sup> case shows the need to identify the value of such purchase. Unlimited access to data sources comes from the ICT sector 26% and the Telecommunications and Logistics which equally share 28%. The analysis ensured the belief that the Telecommunications and the shipping industry use or are willing to have access on large volumes of data regularly measured at 27% for each one. If we consider the size of such organisations and the capabilities to invest, we may assume the potential increase of data-driven services.

#### Key Finding [Data Profile Section]

This category was designed to assist on the identification of the important attributes when using data, as well as, to rate several data / service sharing aspects. In (Figure 34) is portrayed that the accuracy of the data is of a very importance since 75% of the answers reported, the data availability was measured as important at 42% and as, very important at 47% of the responses. Moreover, the data compatibility was measured as important at 25%, and as very important at 41%. Data being up to date was important at 43% of the responders and important at 48%. This was verified in (Figure 35), where specific parameters such as, the availability, the reliability, the interoperability, and the easy access were considered as very important data/service sharing parameters compared with the seamless user interface the robustness and the responsiveness, that were also important ones but with lower priorities.

#### Key Finding [Data Platform Adoption Section]

The feedback given in this category was related to the options that the organisations support in terms of the data taxonomy mechanisms. The results were rather complicated since the responders were able to select more than one option. The Table 6, attempts to clear the results shown in (Figure 36). More specifically, the option of the private sharing platform whether it is selected with a partner sharing platform or a federation of platforms reach 49% of the responses, while the public sharing approach with all the additions reach 26%. The 13% includes partner sharing platforms that is owned or managed by a trusted partner. Indicative, (Figure 37) depicts research centres have a preference in public sharing platforms while ICT vendors, Telecommunications and shipping industries are favour the private or the partner sharing platforms. These answers rise a significant security concern regarding the adoption of such solutions.

21. Which of the following options do you support, in terms of the data taxonomy (classification)? Pick all supported model	%	sum %
---	---	-------

A federation of Sharing Platforms provided by various sources (partner, private, etc.)	5%	
no supported models	2%	
Not to my knowledge	3%	
Partner Sharing Platform (owned and managed by a trusted partner)	10%	13%
Partner Sharing Platform (owned and managed by a trusted partner); A federation of Sharing Platforms provided by various sources (partner, private, etc.)	3%	
Private Sharing Platform (owned and managed internally)	31%	
Private Sharing Platform (owned and managed internally); A federation of Sharing Platforms provided by various sources (partner, private, etc.)	4%	
Private Sharing Platform (owned and managed internally); Partner Sharing Platform (owned and managed by a trusted partner)	10%	
Private Sharing Platform (owned and managed internally); Partner Sharing Platform (owned and managed by a trusted partner); A federation of Sharing Platforms provided by various sources (partner, private, etc.)	3%	49%
Private Sharing Platform (owned and managed internally); Partner Sharing Platform (owned and managed by a trusted partner); A federation of Sharing Platforms provided by various sources (partner, private, etc.); ARIS	1%	
Public Sharing Platform (owned and managed by an unrelated business)	8%	
Public Sharing Platform (owned and managed by an unrelated business); A federation of Sharing Platforms provided by various sources (partner, private, etc.)	4%	
Public Sharing Platform (owned and managed by an unrelated business); Partner Sharing Platform (owned and managed by a trusted partner)	5%	
Public Sharing Platform (owned and managed by an unrelated business); Partner Sharing Platform (owned and managed by a trusted partner); A federation of Sharing Platforms provided by various sources (partner, private, etc.)	4%	26%
Public Sharing Platform (owned and managed by an unrelated business); Private Sharing Platform (owned and managed internally); Partner Sharing Platform (owned and managed by a trusted partner)	2%	
Public Sharing Platform (owned and managed by an unrelated business); Private Sharing Platform (owned and managed internally); Partner Sharing Platform (owned and managed by a trusted partner); A federation of Sharing Platforms provided by various sources (partner, private, etc.)	2%	

**Table 6 Survey No. 1 - Data Taxonomy**

Regarding the final question of the survey that measures the willingness of the organisations to adopt data-driven platforms and at what extent, the results in (Figure 38) depict that although the quite logical reluctance for an organization to change the “business as usual” and enter a totally new market, the unwillingness in some categories is at high levels.

The finding in (Figure 39) show that, most organisations are willing, at least to an extent, to provide any type of physical infrastructure. Cargo / logistics are not willing to do so. On the other hand, there is a scepticism among shipping/maritime organization to host an instance of DataPorts platform. The results are more optimistic for ICT vendors, Telecommunications and Research centres as shown in (Figure 39) and the willingness to apply data security measures is reported by any responder. However, most of the responders have an interest to provide an API for data exchange, especially the ICT vendors, the Telecommunications and the research centres. The data analysis also shows the possible use of software solution to interact with the DataPorts platform. The numbers were reported increased not only for the ICT vendor and the research centres, but also for shipping organisations.

It can be concluded from the analysis above that Cargo and logistics organisations were not willing to have access to such marketplace. In some cases, the uncertainty and protection of what they possess could be interpreted as these industries are not fully digitized in many countries, or the competition is not at a level that transformation is a necessity. However, most of the organisations are willing at degree to invest and to

be a part of such marketplace and perhaps use DataPorts platform. Promising results not only for DataPorts platform but also for the transformation of the seaports.

The survey was intended to identify the needs for data and service sharing in the seaports' ecosystem in order to validate the necessity for a data drive platform and at the same time to highlight the important parameters that should be taken into account by DataPorts for the implementation of the platform. It is observed from the analysis that there are several industries that could be highly involved in the seaports' transformation through the offering of data and services, some others are willing to explore to an extend and measure the benefits before be more actively engage and there are some organizations were their delay in digital transformation is causing either an unwillingness to be on-board or creates some scepticism.

There are several Impact KPIs set by DataPorts that will try to influence and increase the number of data providers and data consumers in this marketplace.

#### 5.4 APP-ATHON

To increase the impact of DataPorts project on the academic and developers' community, ICCS and OTE organized a series of application development challenges (App-athon), with the vision of improving citizens' quality of life. The App-athon took place during the spring semester 2019-2020 "Internet & Applications" course, which is part of the education program of the School of Electrical and Computer Engineering of the National Technical University of Athens (NTUA).



Figure 5 App-athon webpage

In the context of the App-athon, students and developers were requested to create innovative applications, on top of open data sources, but also exploiting data coming for various H2020 EU projects. A dedicated webpage was created (Figure 5) to disseminate and communicate the event, publishing there all the information needed to take part in the App-athon, such as participation guidelines, challenges, offered tools description, available data sources analysis etc.

##### 5.4.1 Data sources

One of the major requirements, that the participants had to fulfil, was the usage of at least one dataset, either open or proprietary. For this reason, the organizers gave access to specific data sources (under specific rules), mainly derived from H2020 EU projects, in which ICCS is involved. In the case of DataPorts, the participants had the chance to create knowledge, analysing subscribers' mobility data provided by OTE. In order to comply with GDPR those date were aggregated and anonymized.

The following list presents the description of the data fields:

- Number of distinct users
- Number of incoming voice calls
- Number of outgoing voice calls
- Number of incoming SMS
- Number of outgoing SMS
- Total bytes uploaded
- Total bytes downloaded
- Municipality which group of cells, that users for this time period used, are located
- Latitude which group of cells, that users for this time period used, are located
- Longitude which group of cells, that users for this time period used, are located
- Municipality which group of cells, that users used for the previous time period, are located
- Latitude which group of cells, that users used for the previous time period, are located
- Longitude which group of cells, that users used for the previous time period, are located
- Time period in Hours (e.g. 0, 1,..,23)
- Date of events
- Day of the week
- Flag if this date is weekend day
- Flag if this date is a bank holiday

In terms of time and place, the provided dataset contained information regarding months August and November 2019, in the area of Thessaloniki, Greece.

#### 5.4.2 Procedure and results

The initial plan was to organize the App-athon in the NTUA premises, but due to the coronavirus crisis, it was held remotely. A kick-off event, that took place on 5 June 2020, marked the official beginning of the App-athon (Figure 6).

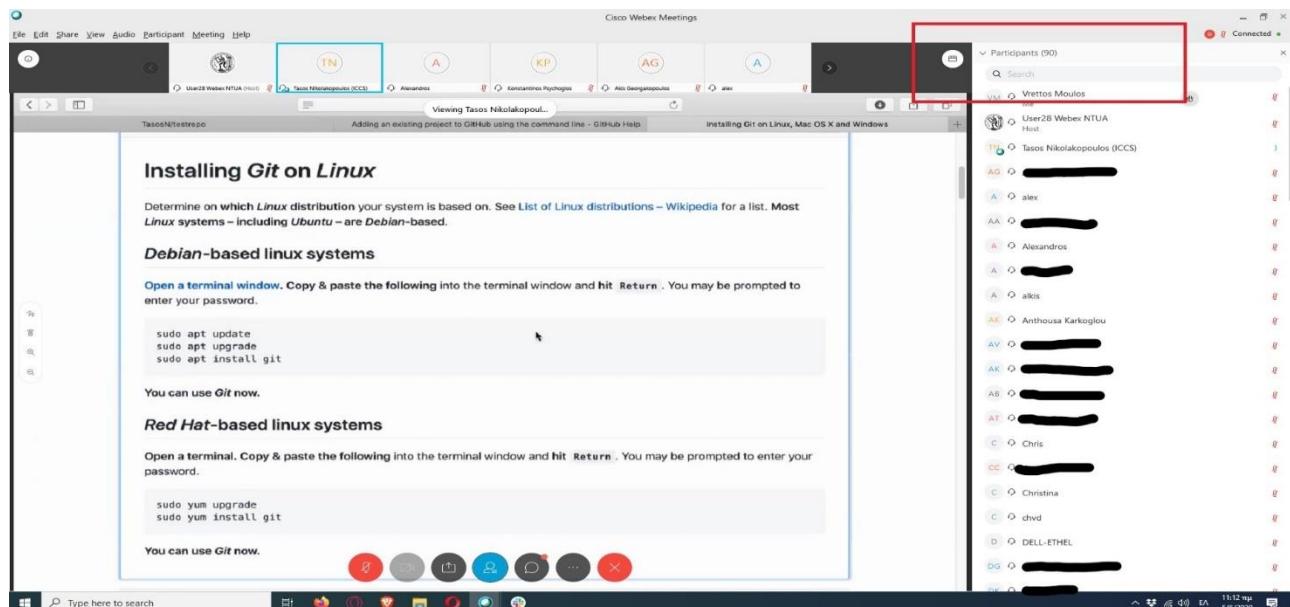


Figure 6 App-athon kick-off event

During this teleconference, the organizers analysed the official procedure of the App-athon, highlighting its important milestones. In addition, a follow-up info event (Figure 7) was scheduled for the 12th of June 2020, whose aim was to describe all the tools, data sources and services that were made available to the participants for potential use.

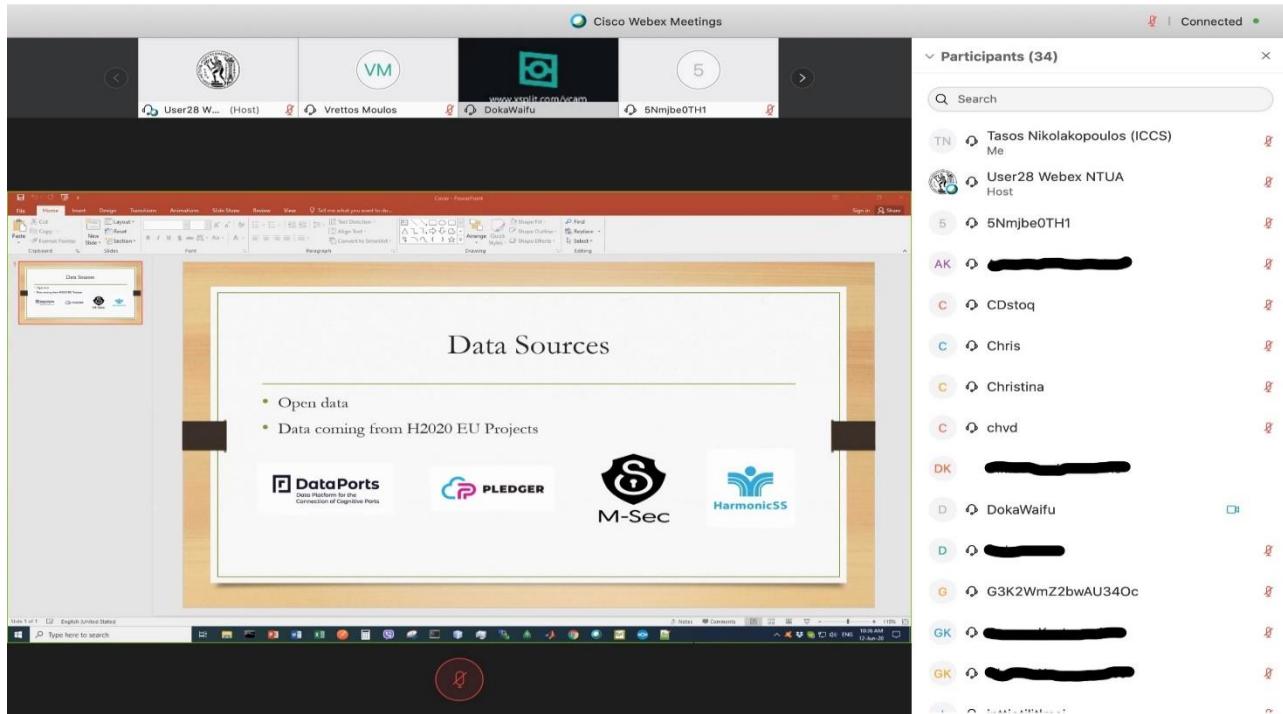


Figure 7 App-athon follow-up info event

Regarding the roadmap of the App-athon, people were invited to submit their proposal to the committee by 26 July 2020 and then receive notification of proposal acceptance by 28 July 2020. Accepted ideas included, among others, the concrete goal(s) of the application, a thorough analysis of the provided functionalities as well as the technology stack that was used to build the whole system. The deadline for the submission of the final project was set for 11 August 2020, meaning two weeks after the proposal acceptance. According to the guidelines, the project should be hosted on GitHub and include:

- The implementation source code
- A Readme.md file containing instructions for installing-executing the code along with a description of the solution and the implementation
- A short presentation describing the architecture of the system
- A YouTube video that presents the functionality of the system, together with some running examples

In total, 87 people participated in the App-athon, delivering interesting applications that combined diverse data sources. For instance, some projects correlated telecommunication, transportation and weather data regarding the metropolitan area of Thessaloniki (Figure 8 and Figure 9), in order to extract advanced knowledge and thus create benefit to the citizens. All the projects were made publicly available through GitHub. Indicative applications can be found in the following links:

- <https://github.com/chrisbetze/internet-and-applications>
- <https://github.com/CodePsychedelic/InternetApplications>
- <https://github.com/SifuMaster/Appathon-NTUA-2020>
- <https://github.com/ilolis/Appathon>

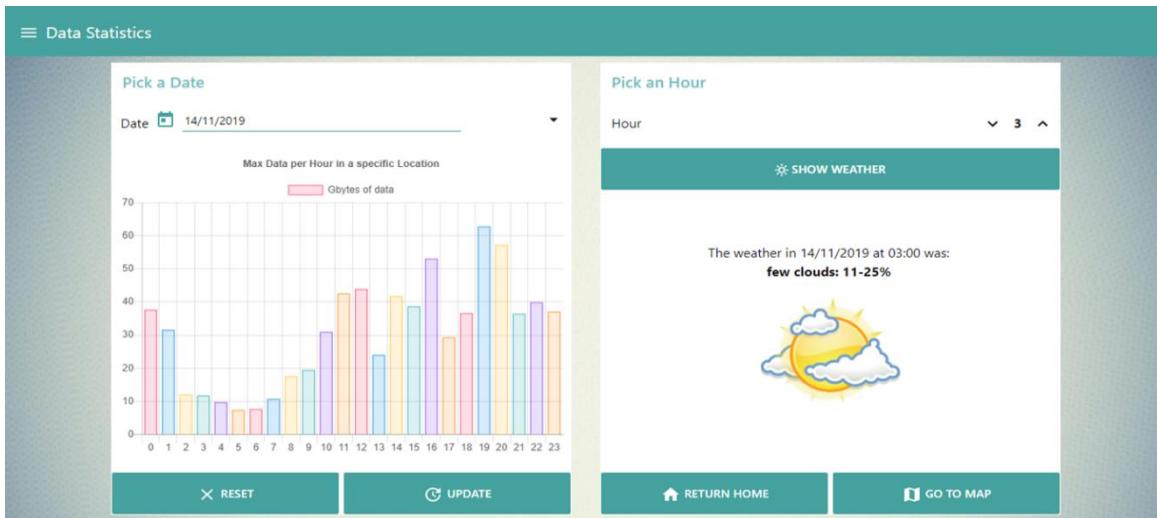


Figure 8 App-athon project example #1

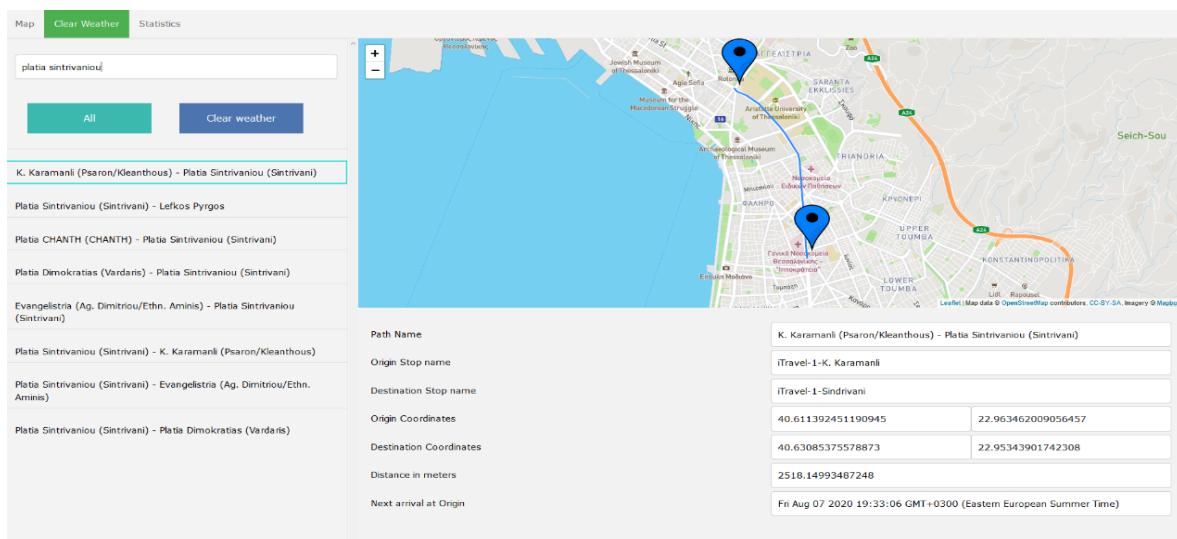


Figure 9 App-athon project example #2

## 6 CONCLUSIONS

This document describes the execution plan of the Impact KPIs of DataPorts. It is divided into an impact categorisation, the KPI execution plan and the outreach activities that include a conducted survey and an App-athon. The main goal of the proposing execution plans is to provide a strategy for each KPI, with a timetable to practically monitor their progress and conduct the evaluation.

More specifically, the Impact KPIs have an important role regarding the adoption of a DataPorts platform by the seaports' community. Measuring the Impact KPIs is the only way for the project to check either that it is going in right direction and achieving its targets in terms of the pre-set objectives and goals or not. For this purpose, the Impact KPIs measures are used to monitor and evaluate the overall progress towards the adoption of DataPorts by the pilot ports communities. Most of the Impact KPIs are focused on increasing the data and service availability and follow the main categories in terms of social, economic, environment, and innovation impact.

Impact KPI progress monitoring will be reported periodically within the context of D6.3 annual updates and adjustments may be applied accordingly. The continuous monitoring and the impact evaluation will allow DataPorts to actual measure the accomplishment level for each KPI. Similarly, deliverable D6.3 revisions will contain the results of the Surveys no.2 "Measure the benefits and the impact form a data-platform usage", Survey no.3 "Data-platform Evaluation: Benefits and Lessons Learnt" and the ideation campaign that will be conducted by OTE (internally). Hence, valuable insights will be available and provide additional information regarding the platform's evaluation and its adoption by the seaports' community.

At this phase the execution plan of each Impact KPI is proposed within the context of this deliverable and in the following months DataPorts partners will work towards the KPIs' fulfilment. Moreover, outreach activities such as the App-athon and the Survey #1 are conducted, in order to identify the seaports' market needs, to propose additional services, as well as to establish DataPorts presence in the community. Additional activities are under investigation to take part in the following months and their results will be presented on the revisions of deliverable D6.3 and will be in accordance with the Impact objectives.

## 7 REFERENCES AND ACRONYMS

### 7.1 REFERENCES

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- [4] Yang, Yongsheng, et al. "Internet of things for smart ports: Technologies and challenges." IEEE Instrumentation & Measurement Magazine 21.1 (2018): 34-43.
- [5] European Commission Report on Open Data: <https://ec.europa.eu/digital-single-market/en/open-data>
- [6] <https://www.fiware.org/>
- [7] <https://www.eclipse.org/>
- [8] <https://projects.eclipse.org/projects/technology.bridgeiot/developer>
- [9] <https://www.ai4eu.eu/>

### 7.2 ACRONYMS

Acronyms List	
AI	Artificial Intelligence
BC	Blockchain
BCO	Beneficial Cargo Owner
CP	Consortium Plenary
DAV	Distributed Authoring and Versioning
DoA	Description of Action
EU	European Union
GA	Grant Agreement
GDPR	General Data Protection Regulation
GHG	Greenhouse Emissions
GPS	Global Positioning System
IoT	Internet of Things
KPI	Key Performance Indicator
KRI	Key Risk Indicator
MoSCoW	Must have, Should have, Could have, and Won't have
PC	Project Coordinator

Acronyms List	
PMB	Project Management Board
PPR	Project Periodic Report
QM	Quality Management
RM	Risk Management
SME	Small Medium Enterprise
SMS	Short Message Service
TM	Technical Manager
WPL	Work Packages Leaders
WT	Waterborne Transport

**Table 7 Acronyms**

## 8 ANNEX 1: SURVEY # 1 – ONLINE QUESTIONNAIRE

The survey was designed and executed using Google Forms. <https://forms.gle/VtnfWx8St9h2ZXt7>

### Survey

#### DataPorts H2020 Project

Horizon 2020 Call: H2020-ICT-2018-2020

Topic: ICT-13-2018-2019

Supporting the emergence of data markets and the data economy

Type of action: IA Proposal number: 871493

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DataPorts platform is a digital platform with the focus on data sharing and trading in the maritime sector and the whole supply chain surrounding the shipping industry. The platform serves as a marketplace for data consumers and providers, allowing for fast, easy and trustworthy data sharing and the usage of big data solutions in the form of data applications and services. Key aspects of the platform are data security, data sharing, data interoperability, and data standardisation, as well as the platform interoperability with existing solutions.

The scope of this questionnaire is to identify the needs of known or unknown (potential) stakeholders in the shipping port's ecosystem. The responses will inform future proposals and allow us to create new datasets or AI-based cognitive services directly catered to the stakeholders' needs.

**Who should respond?** Anyone interested to see how collaboration can foster innovation within their organisation and in particular anyone that wants to be inspired from the following list: Startups, SMEs, Large Industries, Shipping Companies, Public Authorities, Forwarders and shippers, Ship agents, Terminal operators, Surveyors, Transport operators, Software developers, Researchers, LEAs, etc.

#### Legend

• Bullet Points are single choice questions			
<input type="checkbox"/> Checkboxes are multiple choice questions (pick all applicable)			
Tables are one choice per line	X		
Blank lines are for fill-in possibilities (other)			

---

#### General

##### 1. What is the size of the organisation that you represent?

- 1-9 employees (Micro)
- 10-49 employees (Small)
- 50-249 employees (Medium)
- Over 250 employees (Large)

##### 2. What is your company's field of operation?

- ICT Service Vendor
- Network Operator
- Telco
- Software House

- Data Provider / Data Broker
- University/Research Institute
- Shipping / Maritime
- Public Body (Health, Security, Municipality, etc.)
- Transportation
- Commerce
- Marketing / Advertising
- Cargo & Logistics
- Other (please specify) .....

**3. What is your role in your organisation?**

- Technical/Engineer
- Information Technology (IT)
- Legal
- Financial
- Commercial/Marketing/Sales
- Procurement Support/Maintenance
- Management
- Consultant/Advisor
- Researcher/Academic
- Other (please specify) .....

**Platforms Experience**

**4. Does your organisation have past experiences with (digital) platform ecosystems? Please also rate your experience with those platforms**

- No, we don't have any experiences with (digital) platform ecosystems
- Yes, we had experiences with the following platforms (1 = very negative experience, 5 = very positive experience)

**4b. If you replied Yes on 4a, please evaluate your experiences with the following platforms (1 = very negative experience, 5 = very positive experience)**

	1	2	3	4	5
101odatta	<input type="radio"/>				
Clouderra	<input type="radio"/>				
Pivotal BigData Suite	<input type="radio"/>				
Microsoft Azure	<input type="radio"/>				
SAP HANA	<input type="radio"/>				
Vertica	<input type="radio"/>				
TERADATA	<input type="radio"/>				
Hadoop	<input type="radio"/>				

5. We stopped using specific platforms, because of the following reasons

- Dissatisfaction with service
- Outdated
- Security issues
- Inaccuracy
- Others (please specify) .....

**Platform Usage**

6. On a scale of 1 to 5, with 1 being “not at all interested” and 5 being “very interested”, how interested is your organisation in the following activities?

	1	2	3	4	5
Selling Data					
Service Providing					
Buying Data					
Consuming Data services					

7. What type of data are you interested in purchasing?

- Passenger information (e.g. Mobility)
- Container tracking data
- Financial data (custom related)
- Demographics
- Other (please specify) .....
- Not interested

8. What kind of services are you interested in using?

- Ships' Schedule
- Port's Services (e.g. parking)
- Statistics
- Other (please specify).....
- Not interested

**Security and Data Protection**

9. According to your organisation, would you like to be on-board /use / collaborate with a Data Platform that would assure the security base on:

- Ensuring employee confidentiality.
- following rules of Regulatory Compliance
- Applying Data security policy
- Ways to ensure data leakage protection
- Other (please specify) .....

**10. Did your organisation have problems with data security/data governance in the past? Please mark all applicable options**

- After data sharing, our data was distributed without our permission
- After data sharing, our data was used for a non-intended purpose
- After data sharing, our data was not deleted after the agreed upon expiration date
- Data breaches
- Weak identity, credentials and access management
- Insecure APIs
- System and application vulnerabilities
- Account hijacking
- Malicious insiders
- Advanced persistent threats (APTs – a stealthy computer network threat actor, typically sponsored by a nation state)
- Data loss
- Insufficient due diligence
- Abuse and Nefarious use of cloud services
- Denial of service
- Other (please specify) .....

**11. Does your organisation already use some form of security system to protect data of others or to share data?**

- No, we do not use any data security system
- Yes, our company uses a security system to protect data

**11b.** if answer on 11.a is "Yes", please specify .....

**12. Does your organisation process any type of personal data (any information relating to an identified or identifiable natural person)? Please mark all applicable options**

- Our organisation does not process any type of personal data
- Our organisation processes personal data such as name, location data, and an online identifier to factors such as physical, physiological, economic, cultural or social identity of a natural person
- Our organisation processes special categories of personal data revealing racial or ethnic origin, trade union membership, and biometric data (for the purpose of uniquely identifying a person).

**13. In case of processing personal data, which type of operation is performed on personal data or on sets of personal data? Please mark all applicable options**

- Collection
- Recording
- Organisation
- Structuring
- Storage
- Adaption or alteration
- Retrieval
- Consultation
- Disclosure by transmission
- Dissemination
- Aggregation, Combination
- Restriction, erasure or destruction

**14. Which technical or organisational control (mechanism) does your organisation provide to guarantee data protection principles (GDPR Article 5 – transparency, purpose limitation, data minimization, accuracy, storage limitation, integrity, and confidentiality)? Please mark all applicable options**

- Minimize number of data sources
- Minimize knowledge discovery
- Minimize data storage
- Minimize data retention period
- Hide data routing
- Anonymisation
- Authentication
- Authorization
- Sign an agreement
- Logging
- Auditing
- Agreements on the use of data
- Encrypted data communication/processing/storage
- Reduce data granularity
- Distributed data processing/storage
- Certification
- Pseudonymization
- Other (please specify) .....

#### DataPorts Platform Exploitation

**15. According to your organisation's business plan, how do you plan to use offered data / services?**

- Processing for research purposes
- Processing for safe conclusions (decision making)
- More effective mapping of customer needs (customer insights)
- Improving the customer experience
- Improving infrastructures
- Implementation of a new service / product
- Other (please specify) .....

**16. Which proposal would suit your organisation best? I can use data from a data driven platform related to shipping ports to:**

- Get a better overview of the services already provided by my organisation.
- Enrich existing services with new specs.
- Create new services based on the information I will get from the data
- Look for new partnerships with other organisations to provide more complex services.
- Other (please specify) .....

**17. According to your organisation's experience, please rate the severity of each of the following pains (difficulties) related to data sharing when provisioning datasets or services (5: extreme pain, 1: no pain).**

	1	2	3	4	5
No knowledge of customers' requirements					
No knowledge of the fluctuations in customers' requirements over time					
Difficulty in identifying concurrency effects in relation to the Shipping Port					
Difficulties in selecting optimal analytic services					
Guaranteeing the quality of service (QoS) level that has been agreed with the customer					

**18. How often does your organisation want to buy dataset if sufficiently available?**

- Buy single datasets from time to time
- Buy large datasets or dataset groups regularly
- Unlimited access to specific data sources
- Other (please specify) .....

**Data Profile**

**19. What's most important to you when using data? (1 = not important, 5 = very important)**

	1	2	3	4	5
The accuracy of the data.					
The amount of data Volume					
The availability of data					
The ability to provide/consume useful data all year round and not only seasonally (e.g. summer)					
Completeness of the dataset (to not include missing values)					
Being up to date					
Sufficiency					
Compatibility/Standardization					

**20. According to your organisation's experience, please rate the importance of the following aspects in a data /service sharing (5: very important, 1: not important)**

	1	2	3	4	5
Easy Access					
Seamless user interface					
Interoperability					
Responsiveness					
Robustness					
Reliability					
Availability					

#### Data Platform Adoption

**21. Which of the following options do you support, in terms of the data taxonomy (classification)? Pick all supported models**

- Public Sharing Platform (owned and managed by an unrelated business)
- Private Sharing Platform (owned and managed internally)
- Partner Sharing Platform (owned and managed by a trusted partner)
- A federation of Sharing Platforms provided by various sources (partner, private, etc.).
- Other (please specify) .....

**22. Which steps is your organisation willing to take to allow access to the DataPorts marketplace, knowing that all other participants have to do the same?**

	Not willing	To an extend	Willing
Provide a physical infrastructure (e.g. Servers)			
Host an Instance of the DataPorts platform or a Database			
Have data security measures verified			
Provide an API / interface for data exchange			
Implement a software to interact with the DataPorts API / interface			
Adapt existing data to predefined standards			

## 9 ANNEX 1: SURVEY # 1 – GRAPHICAL RESULTS



Figure 10 Q1. What is the size of the organization that you represent?

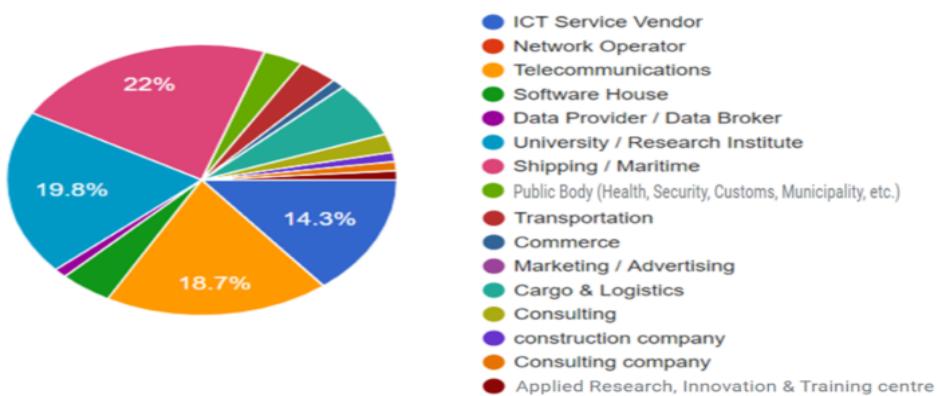


Figure 11 Q2. What is your company's field of operation?

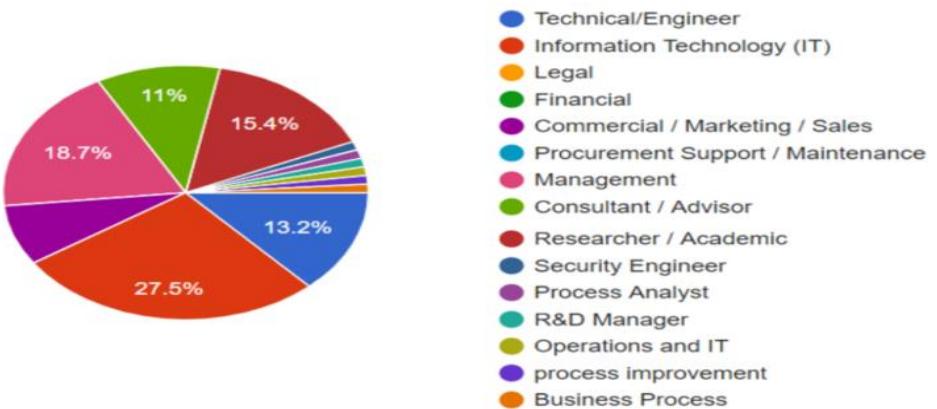


Figure 12 Q3. What is your role in your organization?

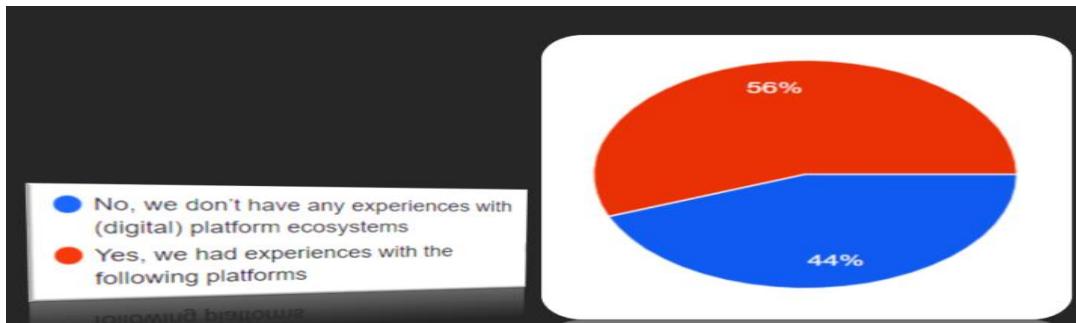


Figure 13 Q4a. Does your organization have the past experiences with (digital) platform ecosystems?

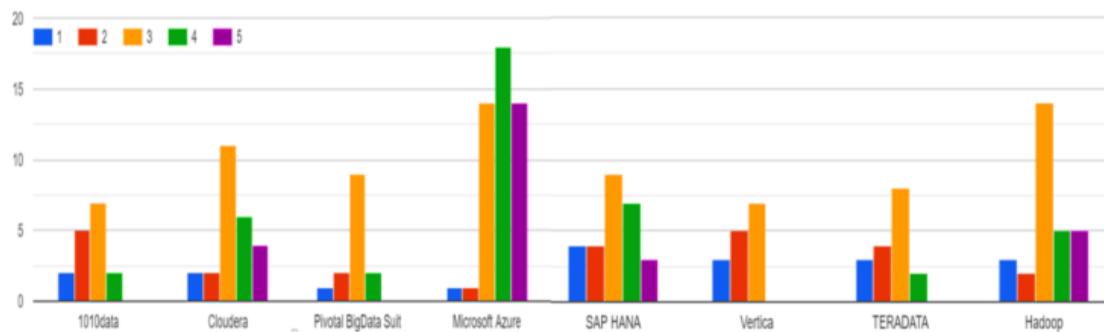
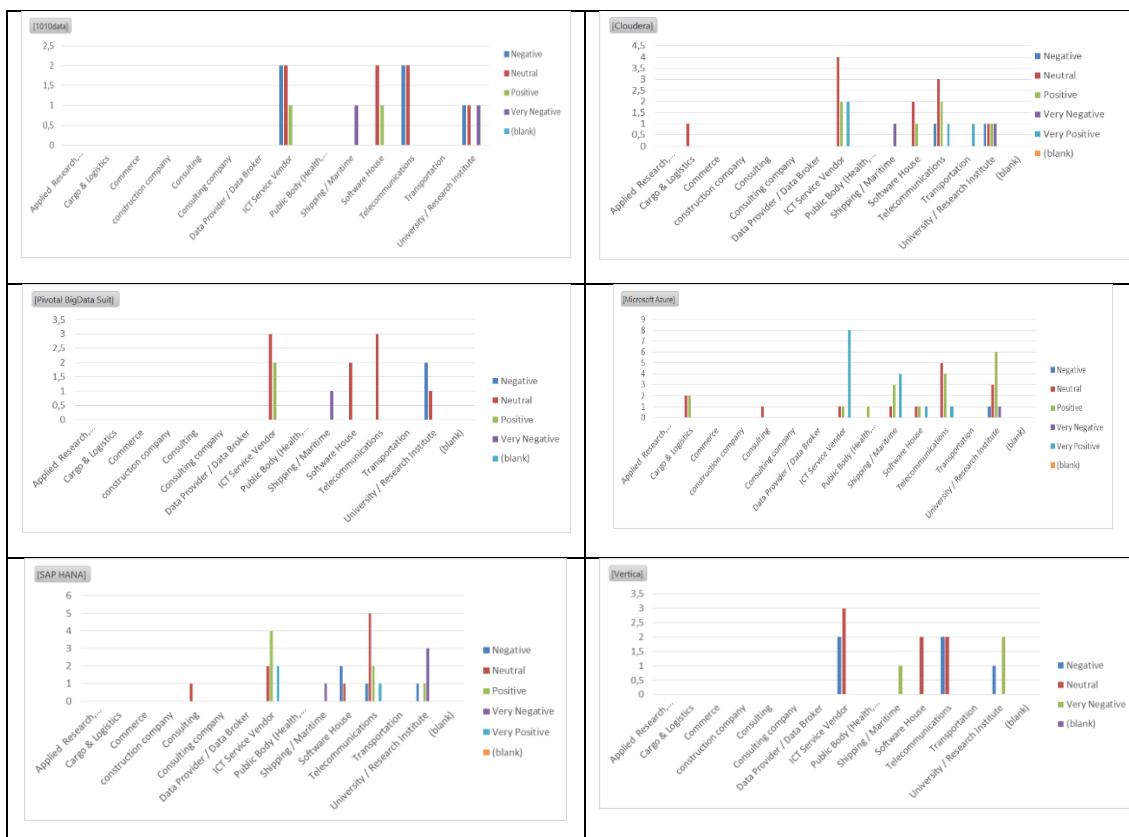
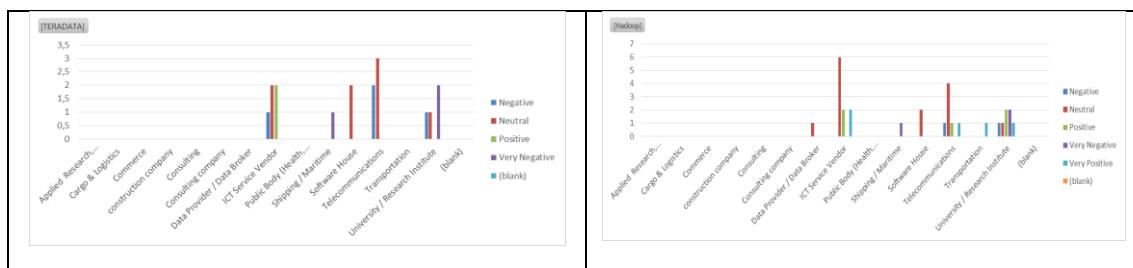
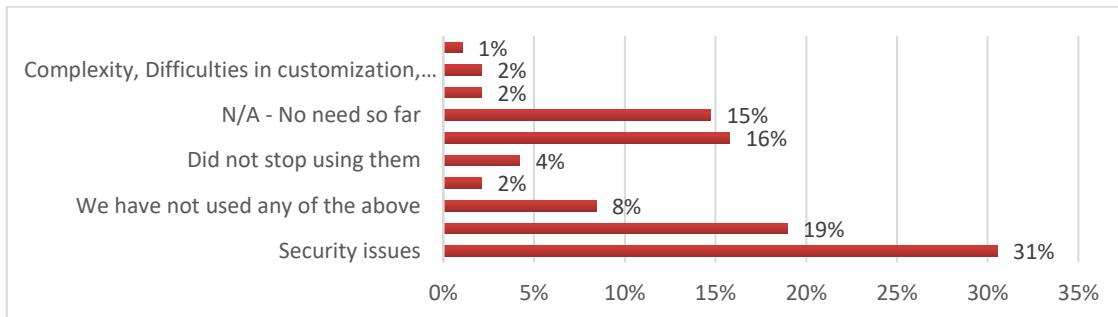
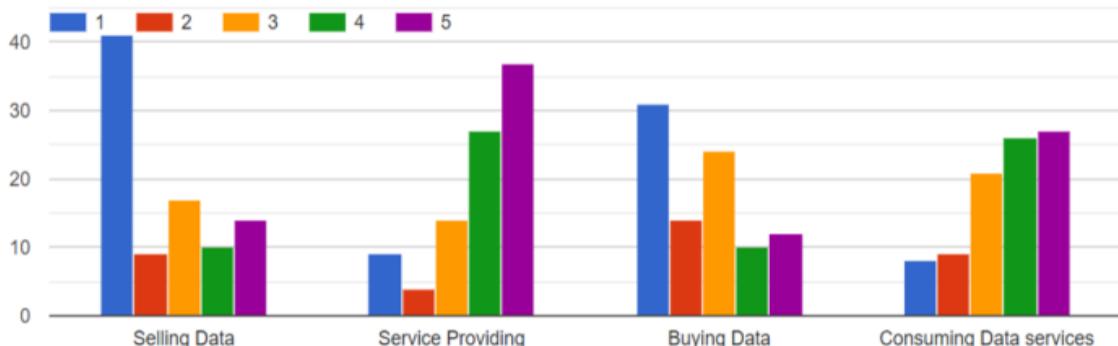
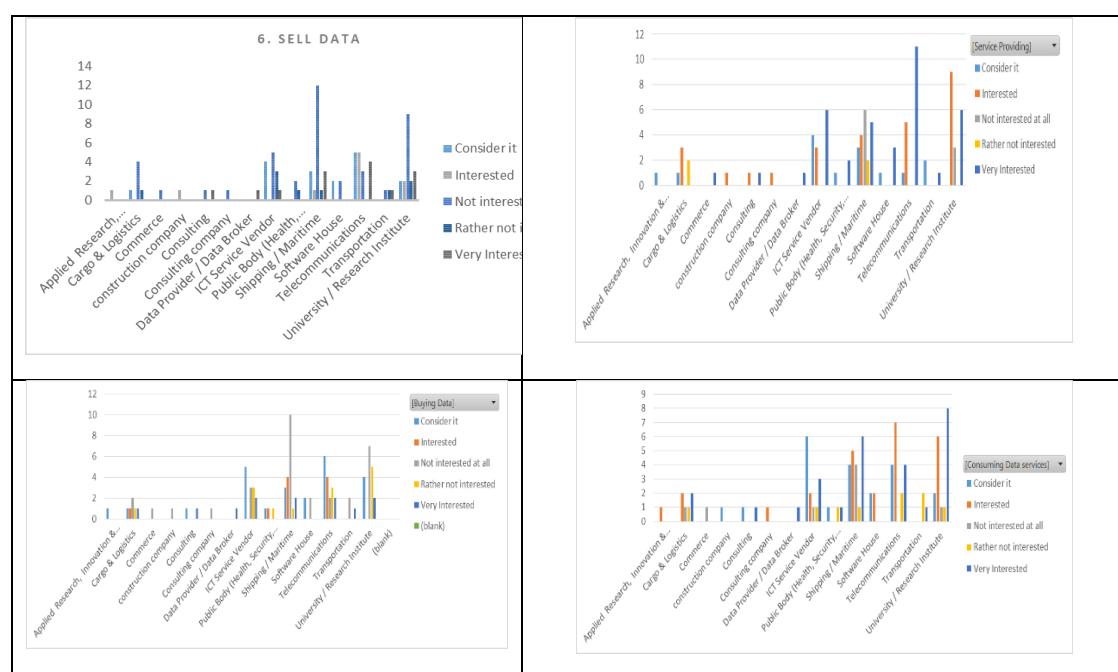
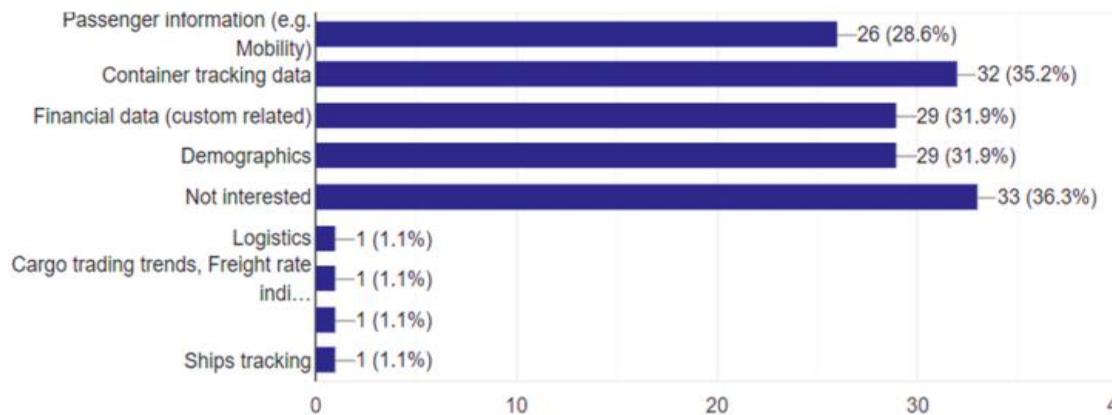
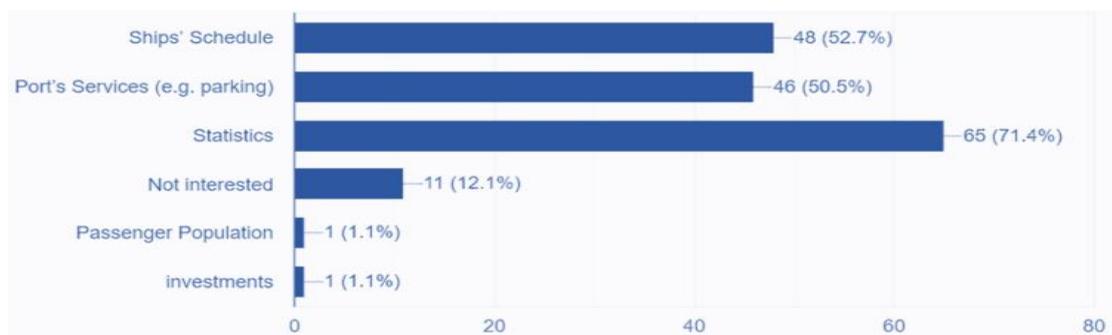
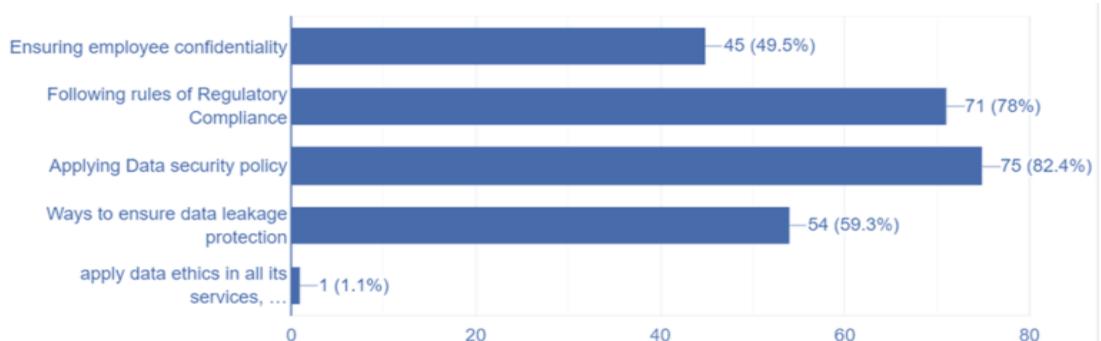
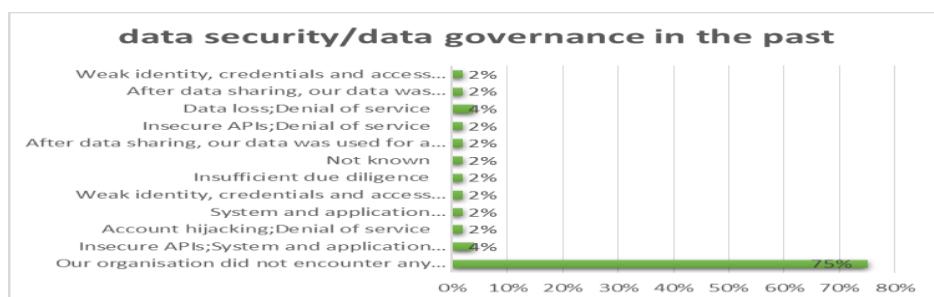


Figure 14 Q4b If you replied Yes on 4a, please evaluate your experiences with the following




**Figure 15 Q4b Analysis**

**Figure 16 Q5. We stopped using specific platforms, because of the following reasons**

**Figure 17 Q6. On a scale of 1 to 5, how interested is your organization in the following activities?**


**Figure 18 Q6 Analysis**

**Figure 19 Q7. What type of data are you interested in purchasing?**

**Figure 20 Q8. What kind of services are you interested in using?**

**Figure 21 Q9. According to your organization, would you like to be on-board/use/collaborate with a Data Platform that would assure the security based on?**

**Figure 22 Q10. Did your organization have problems with data security/data governance in the past?**

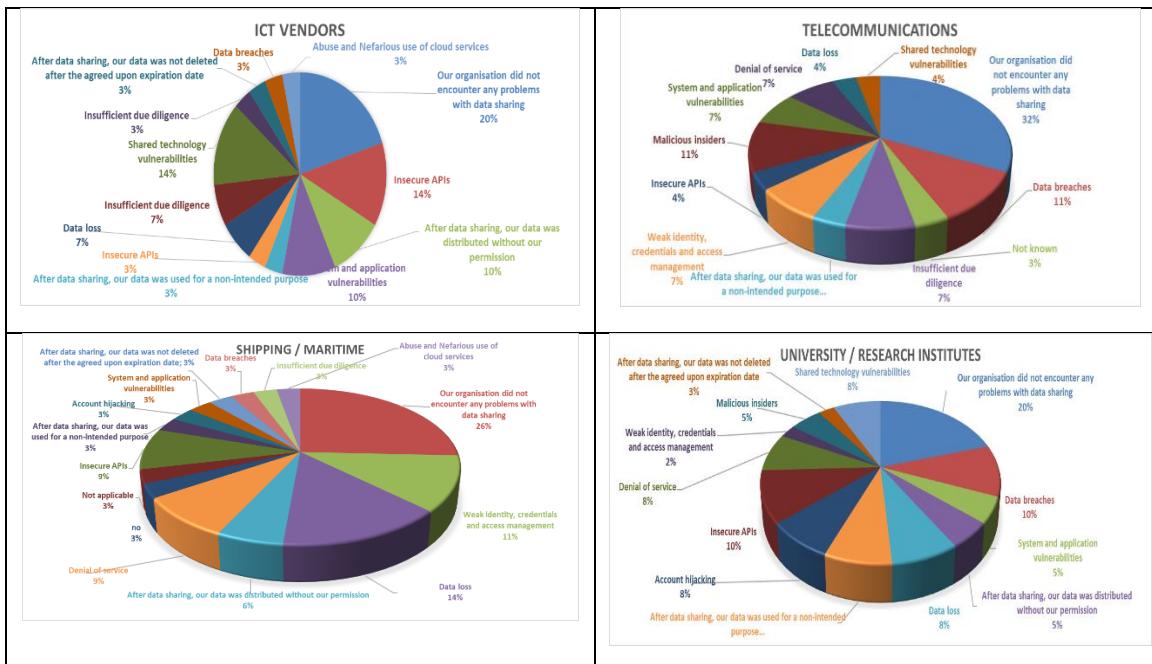


Figure 23 Q10 Analysis

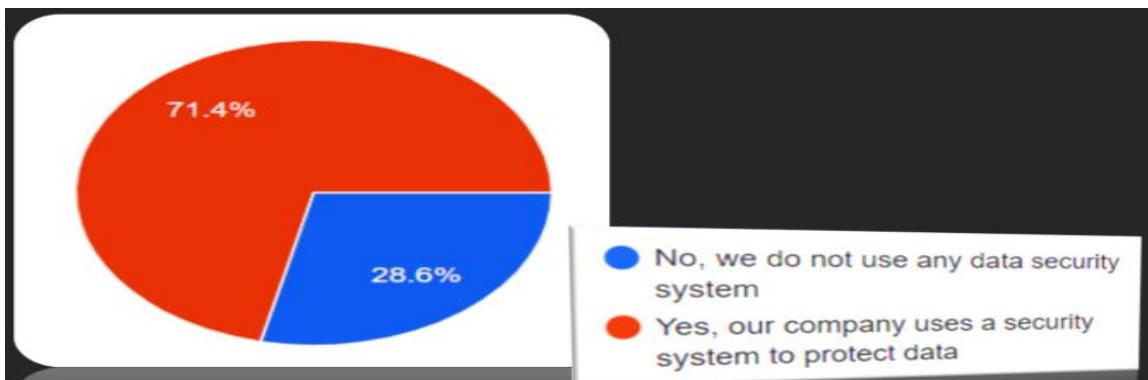


Figure 24 Q11. Does your organization already use some form of security system to protect data of others or to share data?

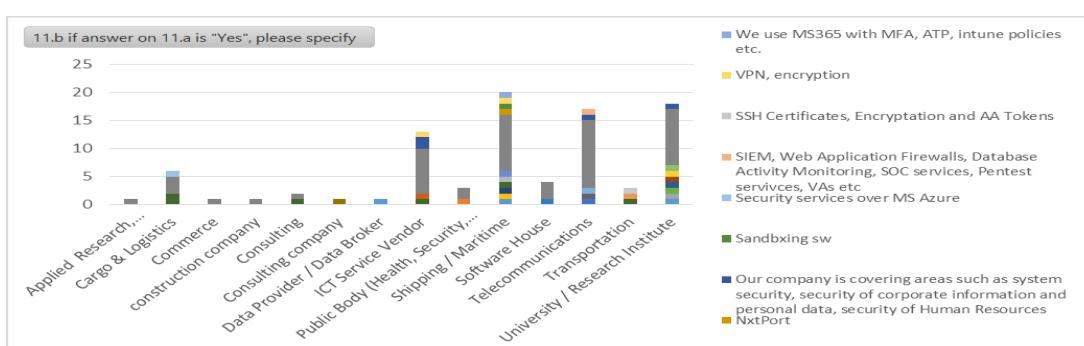


Figure 25 Q11b Specific Replies

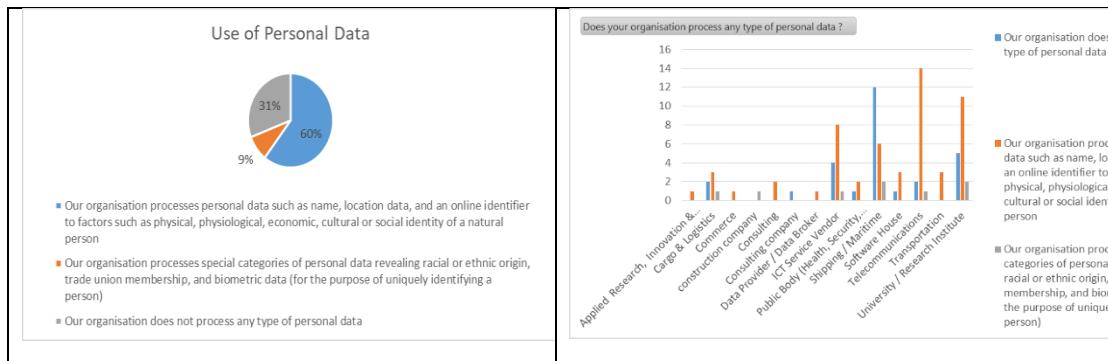


Figure 26 Q12. Does your organization process any type of personal?

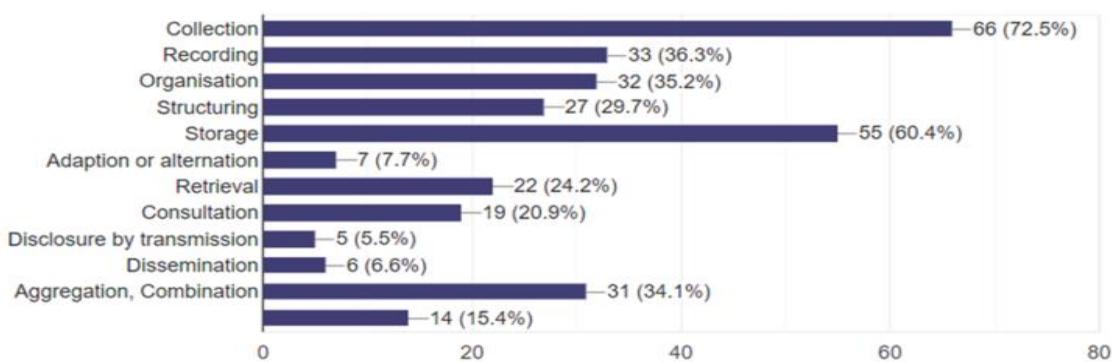


Figure 27 Q13. In case of processing personal data, which type of operation is performed on personal data or on sets of personal data?

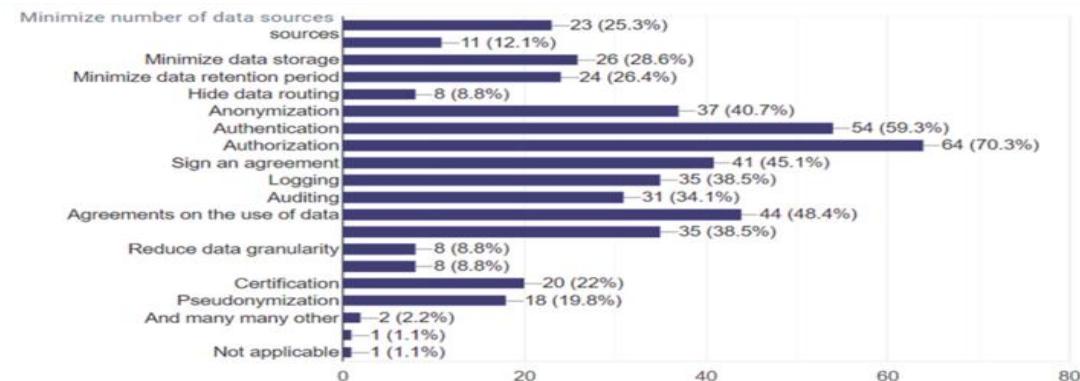
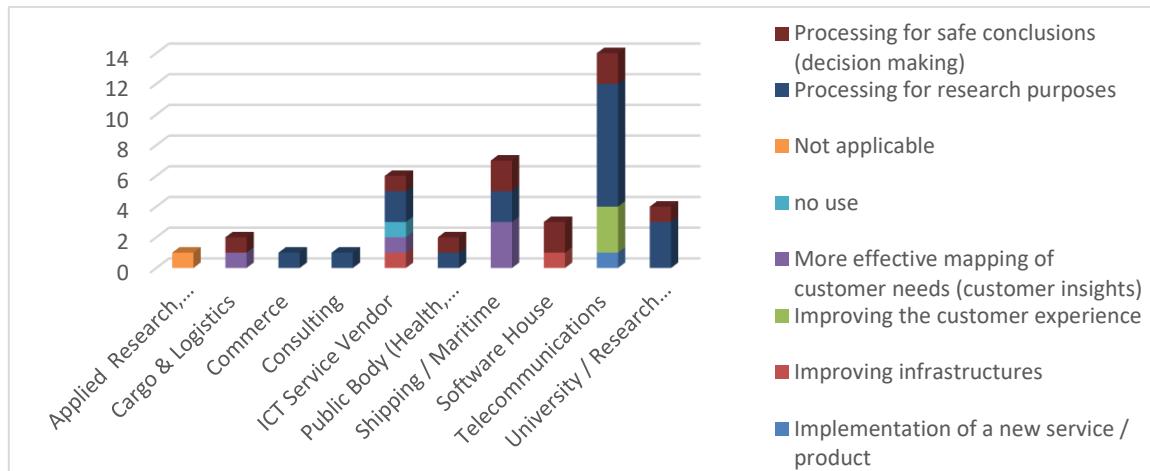


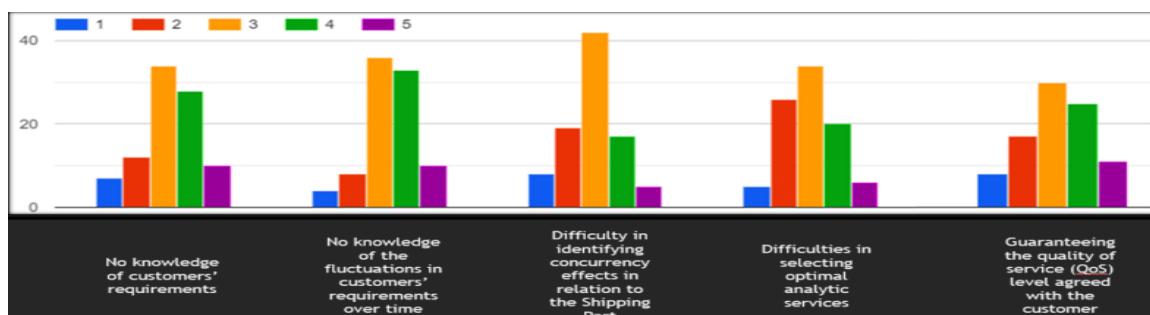
Figure 28 Q14. Which technical or organizational control (mechanism) does your organization provide to guarantee data protection principles (GDPR Article 5 – transparency, purpose limitation, data minimization, accuracy, storage limitation, integrity, and confidentiality)?



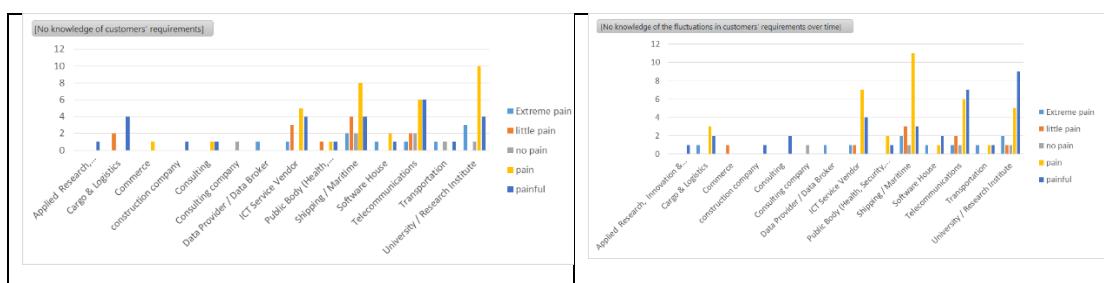
**Figure 29 Q15 According to your organization's business plan, how do you plan to use offered data services?**

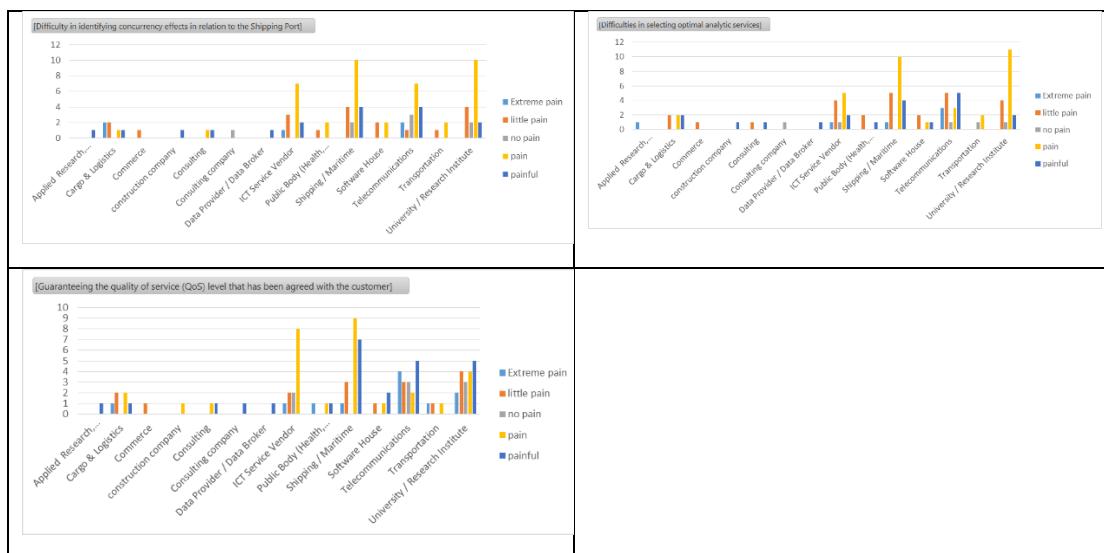
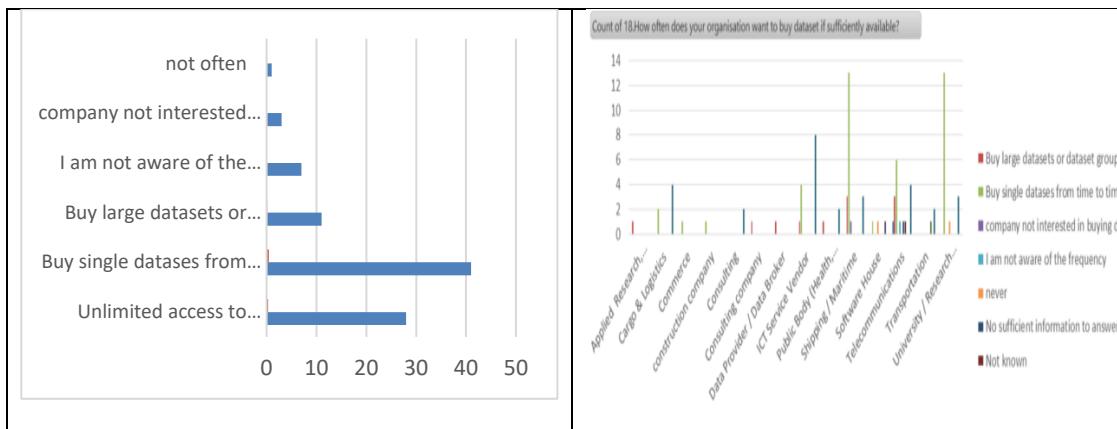
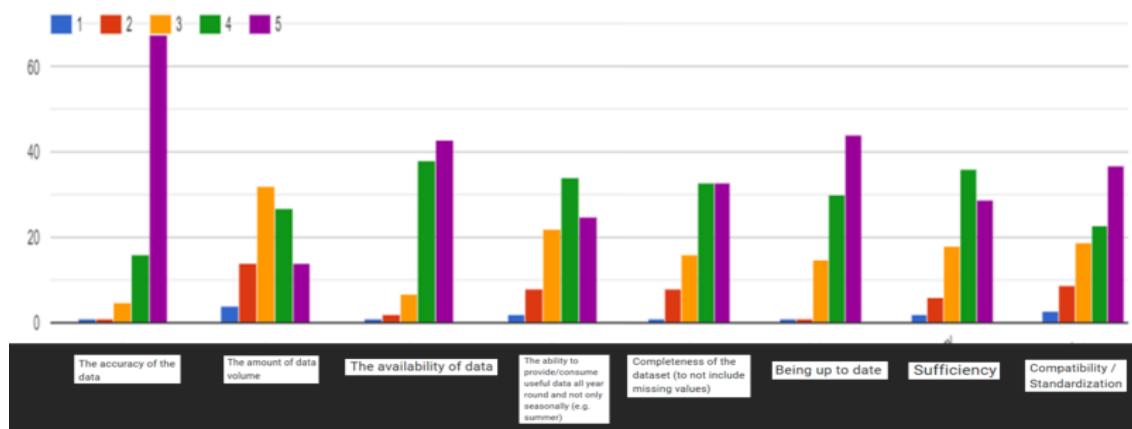


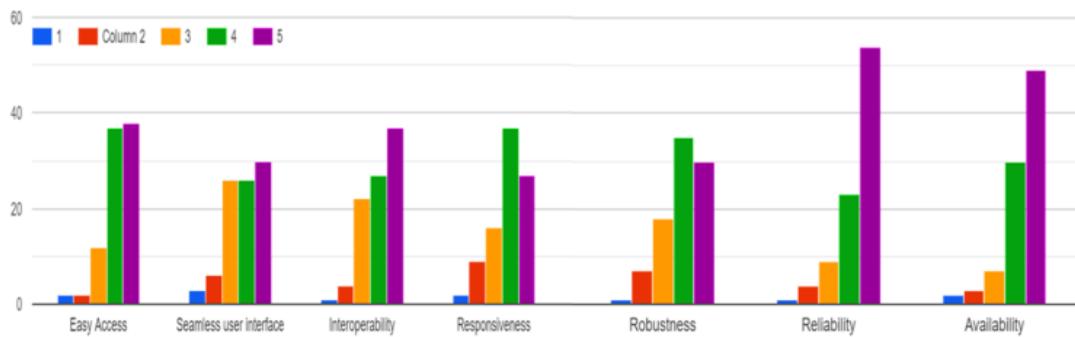
**Figure 30 Q16. Which proposal would suit your organization best?**



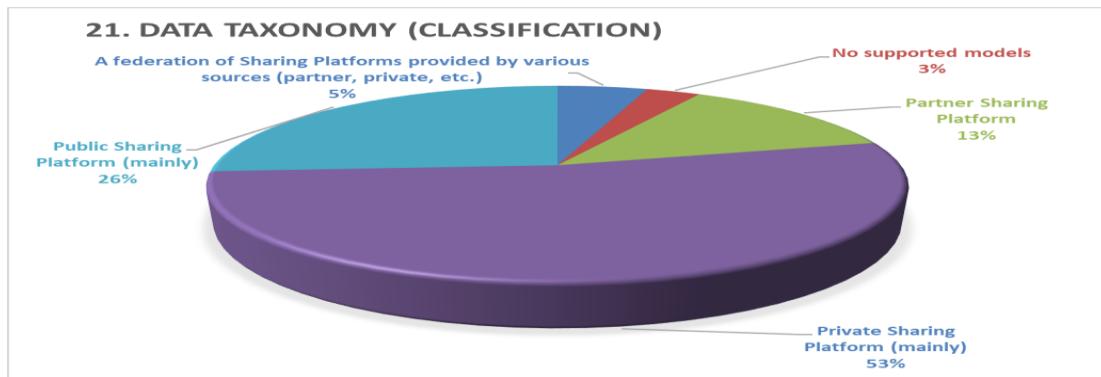
**Figure 31 Q17. According to your organization's experience, please rate the severity of each of the following pains (difficulties) related to data sharing when provisioning datasets or services**




**Figure 32 Q17 Analysis**

**Figure 33 Q18. How often does your organization want to buy dataset if sufficiently available?**

**Figure 34 Q19. What's most important to you when using data?**



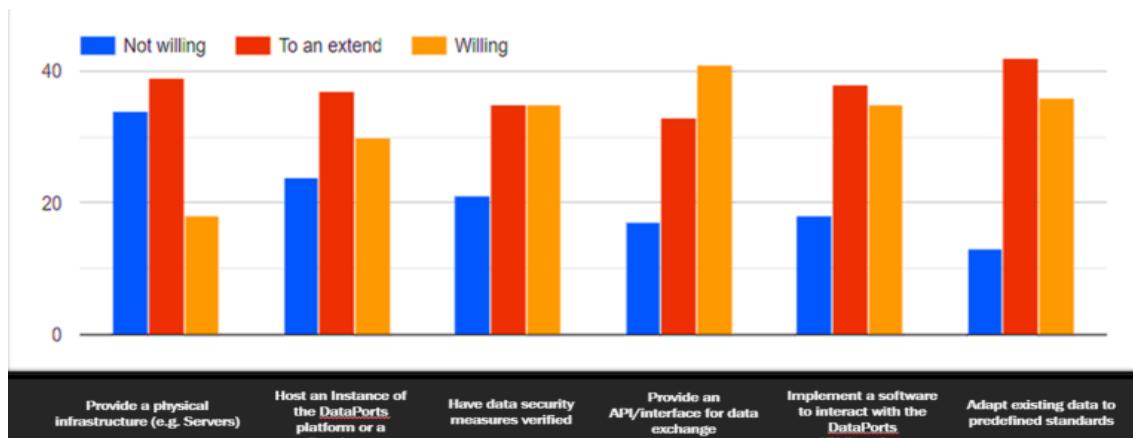
**Figure 35 Q20.** According to your organization's experience, please rate the importance of the following aspects in a data/service sharing



**Figure 36 Q21.** Which of the following options do you support, in terms of the data taxonomy?



**Figure 37 Q21 Analysis**



**Figure 38 Q22. Which steps is your organization willing to take to allow access to the DataPorts marketplace knowing that all other participants have to do the same?**



**Figure 39 Q22 Analysis**