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**Abstract:**

This deliverable describes the overall strategy that will be used to guide the evaluation of DataPorts' requirements and use cases. The evaluation plan is divided into two different scopes: requirements and use cases, and for each scope will clarify goal, roles and responsibilities, methodology and timeline.

The first scope focuses on requirements evaluation, ensuring that the project respects and takes in consideration the requirements that have been defined.

The second scope deals with the evaluation of the use cases: the first part aims to ensure that the defined scenarios are correctly implemented, while the second part is based on the Technology Acceptance Model and aims to evaluate the perceived usefulness and ease of use of the project.

**Keywords:**

Evaluation, plan, pilot, assessment, survey

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*More information available at <https://DataPorts-project.eu>*

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## INDEX

<b>1</b>	<b>INTRODUCTION</b>	<b>5</b>
1.1	DATAPOINTS PROJECT OVERVIEW	5
1.2	DELIVERABLE PURPOSE AND SCOPE	5
1.3	DELIVERABLE CONTEXT	6
1.4	DOCUMENT STRUCTURE	6
<b>2</b>	<b>REQUIREMENTS EVALUATION</b>	<b>8</b>
2.1	GOALS AND OBJECTIVES	8
2.2	ROLES AND RESPONSIBILITIES	8
2.3	EVALUATION METHODOLOGY	9
<b>3</b>	<b>USE CASES EVALUATION</b>	<b>11</b>
3.1	TEST CASES EVALUATION	11
3.1.1	GOALS AND OBJECTIVES	11
3.1.2	ROLES AND RESPONSIBILITIES	11
3.1.3	EVALUATION METHODOLOGY	12
3.2	USER ACCEPTANCE SURVEY	12
3.2.1	GOALS AND OBJECTIVES	13
3.2.2	ROLES AND RESPONSIBILITIES	13
3.2.3	EVALUATION METHODOLOGY	13
3.2.4	QUESTIONNAIRE	14
<b>4</b>	<b>ROADMAP</b>	<b>16</b>
4.1	REQUIREMENTS AND USE CASES	16
4.2	USER ACCEPTANCE SURVEY	16
<b>5</b>	<b>CONCLUSIONS AND NEXT STEPS</b>	<b>18</b>
<b>6</b>	<b>REFERENCES AND ACRONYMS</b>	<b>19</b>
6.1	REFERENCES	19
6.2	ACRONYMS	19

**LIST OF FIGURES**

Figure 1 - Evaluation Plan Roadmap.....	16
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**LIST OF TABLES**

Table 1 - Requirements Responsible Partners .....	9
Table 2 - Requirement Evaluation Partners .....	9
Table 3 - Sample Requirement Evaluation .....	10
Table 4 - Use Cases Evaluation Partners.....	12
Table 5 - Sample test cases evaluation for Verified Gross Mass of Container use case .....	12
Table 6 - Acronyms .....	19

# 1 INTRODUCTION

## 1.1 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.

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## 1.2 DELIVERABLE PURPOSE AND SCOPE

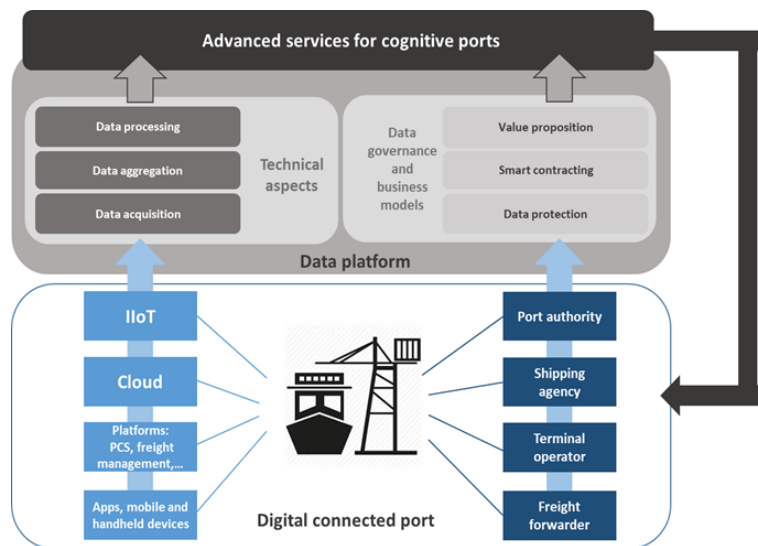
Specifically, the DoA states the following regarding this deliverable:

*This deliverable will describe the overall strategy that will be used to guide the evaluation of the demonstration pilots and use cases. It will include, among others, the scope of the evaluation, evaluation objectives and questions, data sources and data collection methods, data analysis strategy, timelines and reporting dates, and roles and responsibilities.*

The evaluation plan comprises two different scopes: requirements and use cases.

The first scope includes the evaluation of all functional and non-functional requirements defined in the project. The requirements must be verified one by one, assigning acceptance criteria for both mandatory and optional requirements in the form of a percentage of fulfilled requirements.

The latter scope includes the evaluation of test cases and a user acceptance survey for each of the four use cases of DataPorts, as presented in Deliverable D5.1: Valencia Port, Thessaloniki Port, Smart Containers and Port Integration. Each use case defines multiple scenarios, and each scenario specifies a series of test cases to be executed to verify its successful implementation. Like for requirements, each scenario will be evaluated as a stand-alone, and the percentage of successful test cases will be checked against a pre-defined threshold



to determine whether the evaluation is successful. The perceived usefulness and ease of use of the use cases are evaluated through a set of surveys which will be handed out to the final users after testing the DataPorts platform. The surveys will be based on the Technology Acceptance Model [1] and contain both closed (Likert scale) and open questions.

Conceptually, both scopes provide different levels of evaluating the project: on one hand, evaluating requirements allows to objectively check that the software was developed in line with the project specifications; on the other hand, evaluating the use cases ensures that the software can deliver the functionalities it promised. Finally, the user acceptance survey gives an idea of the perceived usefulness and ease of use of DataPorts.

It is worth noting that while Work Package 5 evaluates the DataPorts platform at a more granular technical level, the evaluation of the project impact and results at a global level, including the evaluation of pilots' KPIs, is out of scope of this document and is performed in WP6 task T6.2, and reported in Deliverable D6.3, which will be submitted, and subsequently updated, in M12, M24 and M36.

With respect to the description of this deliverable contained in the DoA, as mentioned in Section 1.2, the content is included as follows:

- The scope of the evaluation is presented in Section 1.2.
- Timelines and reporting dates are discussed in Section 4.
- The remaining mandatory content differs according to the analysed scope, and is reported inside subsections of the sections presenting the different evaluation scopes as follows:
  - Evaluation objectives and questions are described in a subsection called **Goals and objectives**.
  - **Roles and responsibilities** are described in Subsections 2.2, 3.1.2 and 3.2.2 XXX.
  - Data sources, data collection methods, and data analysis strategy are contained in a subsection called **Evaluation Methodology**.

### 1.3 DELIVERABLE CONTEXT

This document's relationship to other documents is as follows:

#### Primary Preceding documents:

- Consortium Agreement (CA): Deals with legal aspects between partners.
- Description of Action (DoA): Provides 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.
- D2.1 - Industrial Data Platforms and seaport community requirements and challenges: Contains the description of requirements and their acceptance criteria.
- D5.1 - Integration, software quality assurance and deployment plan: Contains the description of Use Cases and scenarios.

#### Primary Dependant documents:

- D5.3 - Use case oriented pilots initial version: Contains the description of test cases for the DataPorts use cases, as well as the results of the preliminary evaluation of requirements and use cases.
- D5.5 - Use cases and applications evaluation report: Contains the results of the DataPorts requirements and use cases final evaluation, as well as the results of the user acceptance survey.

### 1.4 DOCUMENT STRUCTURE

This document is structured as follows:

- Section 1 Introduction introduces the deliverable. It contains a high-level overview of the project, the definition of the purpose and scope of this document, its context and structure.

- Section 2 Requirements Evaluation discusses the evaluation of the requirements of the project, specifying the goals of the requirements evaluation, its roles, and responsibilities, and describes the methodology to follow to carry out the evaluation.
- Section 3 Use Cases Evaluation describes the evaluation of the use cases of DataPorts. This Section is divided into two different tasks: the first describes the evaluation of the test cases, whose tasks are very similar to the ones reported in Section 2; the second describes how to evaluate the project using a User Acceptance Survey.
- Section 4 Roadmap presents the roadmap of the evaluation, showing all important dates and tasks on a GANTT diagram, and reporting a short description for each of them in chronological order.
- Finally, Section 5 Conclusions contains the main conclusions of the evaluation plan.

## 2 REQUIREMENTS EVALUATION

This section describes the evaluation method for DataPorts requirements: this comprises non-functional requirements, as well as functional suitability, which is defined in ISO 25000<sup>1</sup> as the degree to which a product or system provides functions that meet stated and implied needs when used under specified conditions. The DataPorts’ requirements are described in Deliverable D2.1 Industrial data platforms and seaports community requirements and challenges.

Although requirements are taken in consideration and tested during the whole development process, two evaluation sessions will be carried out to take the opportunity to provide an evaluation of the platform, assessing its development status and enabling the introduction of necessary changes and adjustments.

The preliminary requirements evaluation will be performed between M21 and M24, and its results will be included in Deliverables D5.3, along with the test cases defined for the evaluation. After the preliminary evaluation, the evaluated methodology will be assessed and improved, reporting any change in Deliverable D5.5. The result of this evaluation will be passed on to WP3, 4 and 5, which will use it to fix any encountered issue and enhance the quality of the software.

The final evaluation will be performed between M33 and M36 and included in Deliverable D5.5.

### 2.1 GOALS AND OBJECTIVES

The objective of evaluating DataPorts requirements is to assess whether the software meets its specifications, and to verify that all requirements have been considered while developing the DataPorts platform.

During this task, all DataPorts requirements will be evaluated: each WP will be considered to have a positive evaluation if the percentage of *PASS* values for that Work Package will comply with the specified minimum threshold, as explained in Section 2.3.

### 2.2 ROLES AND RESPONSIBILITIES

To ensure a correct evaluation process each requirement must be evaluated by a partner, and then the corresponding evaluation should be reviewed and confirmed by a different partner.

Table 1 reports the partner responsible for each of the requirements: this partner is responsible for providing a detailed test case for each requirement, and for executing the evaluation.

Responsible Partner	IDs	Number	Related Tasks(s)
PRO	3.1 - 3.4, 3.6, 3.8, 3.9, 3.31 - 3.36, 3.43, 5.7 - 5.9	17	T3.1, T5.4
IBM	3.11 - 3.17, 4.1 - 4.4	11	T3.5, T4.2, T4.3
CERTH	3.38 - 3.40, 3.47, 4.5 - 4.7, 5.2 - 5.4, 5.21	11	T3.5, T4.2, T4.3, T4.4, T5.1, T5.3, T5.4
ThPA	5.10 - 5.20	11	T5.2, T5.3, T5.4
EVR	4.8 - 4.17	10	T4.1, T4.4
ICCS	3.18 - 3.22, 3.41, 3.42, 3.44, 3.46	9	T3.3

<sup>1</sup> <https://iso25000.com/index.php/en/iso-25000-standards/iso-25010/58-functional-suitability>



Responsible Partner	IDs	Number	Related Task(s)
UPV	3.5, 3.7, 3.10, 3.23 - 3.25, 3.37	7	T3.2
ITI	3.26 - 3.30, 3.45, 5.1	7	T3.4, T5.5
UKL	2.1 - 2.7	7	T2.5
VPF	5.5, 5.6	2	T5.2, T5.3, T5.4

**Table 1 - Requirements Responsible Partners**

Table 2 reports the list of partners responsible for reviewing the requirements evaluation process of a Work Package: The *Reviewer* column shows the reviewer of the corresponding work package. The reviewer of a requirement should not be the same partner responsible for evaluating it, hence there is a third column in the Table, named *Backup Reviewer*, which shows the partner responsible for reviewing the requirements in case the evaluator and reviewer of a requirement were to be the same partner.

WP	Reviewer	Backup Reviewer
2	ICCS	ITI
3	UPV	ITI
4	EVR	CERTH
5	PRO	UDE

**Table 2 - Requirement Evaluation Partners**

### 2.3 EVALUATION METHODOLOGY

Project requirements need to be evaluated one by one: for each of them, the partner responsible for that requirement will execute the corresponding test case and assign it a value from the following list. The reviewing partner should then confirm the output of the evaluation (as an example see Table 3):

- *PASS* – the requirement is completely satisfied (e.g., data passed to the analytics service are clean and integrated).
- *MINOR REWORK* – the requirement is partially satisfied. It is considered as a *PASS*, however there are still some minor fix to perform (e.g., data passed to the analytics service are mostly clean and integrated, however in punctual cases some of them are not, possibly because the cleaning algorithm crashes if some input data is not supplied). This specific value should be chosen only if the problem found in the evaluation is of low importance and does not hinder the correct use of the platform.
- *FAIL* – the requirement is not satisfied (e.g., the analytics services receive mainly non-clean and/or non-integrated data).

The reviewer will then have to confirm the result of the evaluation for that requirement.

DataPorts has both optional and mandatory requirements, which are divided into four subsets: **MUST**, **WON'T**, **SHOULD**, and **COULD**: for each of the subsets there is a different threshold for considering the evaluation successful, agreed upon by all partners in the consortium:

- 90% for **MUST** and **WON'T** requirements
- 75% for **SHOULD** requirements
- 33% for **COULD** requirements

The results of the individual requirement evaluation should be gathered in a table with a structure shown in Table 3 - Sample Requirement Evaluation: each row on the table corresponds to a requirement and shows a) its priority, b) description, c) acceptance criteria, and then report d) evaluation date, e) status and any optional f) comment.

The evaluation of the project is successful if the following conditions apply:

- DataPorts fulfils the *PASS* threshold for both mandatory and optional requirements.
- Considering requirements with both *PASS* and *MINOR REWORK* status, *MINOR REWORK* should be at most 25% of the total (i.e., on a total of 100 *non-FAIL* requirements, at most 25 have a *MINOR REWORK* value). This prevents the evaluation from being successful with a very high percentage of requirements which have *MINOR REWORK* status, requiring at least three *PASS* requirements for each *MINOR REWORK*.

Table 3 shows a few samples of compiled rows of requirements evaluation. In the shown case, the evaluation would not be positive, as the percentage of *MINOR REWORK* is 33%, which is higher than the maximum threshold of 25%.

Req ID	Priority	Description	Test Case / Acceptance Criteria	Evaluation Date	Evaluation Status	Comment
3.30	SHOULD	As an end-user, I want to use continuous data streams, so that the platform provides predictions in near real-time	<b>Given</b> a data source in the DataPorts Platform that periodically generates new data, <b>when</b> I want to generate new predictions as new data arrives, <b>then</b> a ML model subscribed to such data publishes such predictions	13/11/2021	PASS	-
3.35	MUST	As a data consumer I want to be able to cancel a current subscription, so I stop receiving data modifications.	<b>Given</b> a data source available in the DataPorts Platform, <b>when</b> a data consumer wants to delete an active subscription, <b>then</b> the platform must delete the subscription and stop sending updates	13/11/2021	PASS	-
3.40	MUST	DataPorts must provide a common data model schema to get the training data.	<b>Given</b> a data source available in the DataPorts Platform, <b>when</b> I want to query such data, <b>then</b> the data description (schema, columns, metadata) must conform to the DataPorts ontology	13/11/2021	MINOR REWORK	One column shows currency in USD, while it should be in EUR. All other data are correct.

**Table 3 - Sample Requirement Evaluation**

### 3 USE CASES EVALUATION

This section describes the evaluation method for the four DataPorts use cases: Valencia Port, Thessaloniki Port, Smart Containers, and Port Integration. Each use case defines multiple scenarios, and each scenario specifies a series of test cases to be executed to verify its successful implementation. This information is gathered in Deliverable D5.1 Integration, software quality assurance and deployment plan.

#### 3.1 TEST CASES EVALUATION

Like described for requirements evaluation in Section 2, use cases are taken in consideration and tested during the whole development process, and two evaluation sessions will be carried out to verify the implementation of the four DataPorts use cases.

To evaluate the use cases, all the test cases defined for each scenario, and contained in Deliverables D5.3 and D5.4, must be verified.

The preliminary test cases evaluation will be performed between M21 and M24, and its results will be included in Deliverables D5.3. The final evaluation will be performed between M33 and M36 and included in Deliverable D5.5.

It is important to note that Deliverable D5.3 contains both the description of test cases necessary for the preliminary evaluation, as well as the results of the same evaluation. This requires the description of test cases to be completed several months in advance with respect to the deliverable’s due date to allow enough time for completing the evaluation task.

##### 3.1.1 Goals and Objectives

The objective of evaluating DataPorts use cases is to assess whether the software can perform the tasks it was designed to perform.

As aforementioned, during this task, all test cases belonging to the use cases scenarios will be evaluated and assigned a *PASS* or *FAIL* value. All tests should contain the necessary description to assess whether the result of the evaluation is successful or not for that single test. Afterwards, each scenario will be considered individually, and will pass the evaluation if the percentage of *PASS* values will comply with the specified minimum threshold.

##### 3.1.2 Roles and Responsibilities

The first task regarding the test cases evaluation is to define the test cases for the different use cases. These will be gathered in Deliverable D5.3 and should be defined by the same partner responsible to define the scenarios.

Like requirement evaluation, the test cases evaluation task is to be carried out by the partners responsible for writing the use cases.

Each partner will evaluate all the test cases of a given Use Case. To ensure a thorough evaluation, each test case will be evaluated by two different partners: one of them is the partner responsible for writing the test cases for that use case, while the other can be any other DataPorts partner.

Table 4 reports the proposed partners responsible for evaluating the use cases of DataPorts.

Use case	Evaluation partner #1	Evaluation partner #2
Valencia Port	VPF	ITI
Thessaloniki Port	ThPA	CERTH
Port Integration	PRO	VPF

Use case	Evaluation partner #1	Evaluation partner #2
Smart Containers	TRX	ThPA

**Table 4 - Use Cases Evaluation Partners**

In case of discrepancy in the evaluation of a test case between the two partners, the test case will always be assigned the worst value (e.g., if one partner would consider the evaluation of one test case as *PASS* and the other one as *FAIL*, the value assigned to that test case will be *FAIL*).

After the preliminary evaluation, the evaluated methodology will be assessed and improved, reporting all changes in Deliverable D5.5. The evaluation results will be passed on to WP3, 4 and 5, which will use it to fix any encountered issue and enhance the quality of the software.

### 3.1.3 Evaluation Methodology

For each DataPorts use case, a set of test cases and validation criteria must be defined for each scenario. Those are collected in Deliverables D5.3 and D5.4

The test cases have a *PASS* or *FAIL* value. To ensure high quality standard for the project, the evaluation will have a positive output if at least 90% of all tests of each scenario are successful. The high threshold ensures that the scenarios described are correctly implemented.

Table 5 shows a sample evaluation of use cases: a few sample tests are shown, each of them showing the corresponding description, evaluation date, status, and optional comment. Those tests are generated starting from the description of the Verified Gross Mass of Containers of Valencia Port use cases, as specified in Deliverable D2.3 Blockchain Design Specifications.

In the shown example the evaluation would fail, as there is a 33% fail tests, while the maximum threshold is 10%.

Test ID	Description	Evaluation Date	Evaluation Status	Comment
1.1	Weight a container and add the value to the system.	20/01/2021	PASS	-
1.2	After weighting a container, directly access its weight both through the port system and the shipping company's system. The weight of the container should be available in real time and be correct.	20/01/2021	FAIL	The weight of the container is shown in the port system, but does not appear in the shipping company's system
1.3	Perform the payment of the weighting using the online recharge system.	20/01/2021	PASS	-

**Table 5 - Sample test cases evaluation for Verified Gross Mass of Container use case**

## 3.2 USER ACCEPTANCE SURVEY

While the test cases and requirements evaluation verify that DataPorts has been developed according to the specifications defined for the project, and that it implements all the required functionalities, the user acceptance survey will evaluate the usability of the software and how it will help users to perform their daily tasks. Each of the use cases of DataPorts will be evaluated with a survey based on the Technology Acceptance Model (TAM) [1], composed of both Likert closed questions and open questions.

The results of this evaluation will be collected and evaluated in Deliverable D5.5.

### 3.2.1 Goals and Objectives

The goal of the user acceptance survey is to cover the evaluation of the implementation left out by formal requirements and use cases, such as whether the software is intuitive and easy to use, if using it provides value to the final users, and whether the users are willing to use DataPorts. Users can also offer advices and share their doubts, granting the possibility of tackling some aspects which might have remained hidden during the earlier phases of the project.

Each use case will be evaluated separately, analysing the Likert questions to verify whether the use cases pass the evaluation, and considering the open questions one by one to gather additional feedback.

### 3.2.2 Roles and Responsibilities

The final version of the questionnaire will be defined before the final evaluation: the responsible partner of this task is ITI, however in case different questionnaires are defined (one for each use case), the responsible to provide the questionnaire is the same partner responsible for defining the scenarios and test cases for the use case.

To get as much data as possible, the survey must be filled in by all the users which participate in testing the use cases, as described in Section 3.1.2: each use case will be tested by two partners, and each of them should fill in at least two surveys. This would help guaranteeing that the minimum number of five surveys for each use case is achieved. The partners responsible for completing the survey are the same responsible for evaluating the use cases, shown in Table 4 in Section 3.1.2, as they must already perform all the tests for the specified use case.

In addition to those, there are two events forecasted towards the end of the project, one in Valencia and one in Thessaloniki, where there is the opportunity to present the final release of the software and have more people fill in the survey. In this case there is the opportunity to have the surveys filled out by the target users of DataPorts: people working directly in the ports.

The analysis of the data acquired through the questionnaire will be performed in the scope of Deliverable D5.5, according to the methodology described in the following Section.

### 3.2.3 Evaluation Methodology

The survey will be handed out, using Google Forms or a similar tool, towards the end of the project, after the final version of the software is released.

The questionnaire, described in detail in Section 3.2.4, contains a series of Likert questions with answers in the range *Strongly Disagree* - *Strongly Agree*, with the addition of the "Not Applicable" value. A value going from 1 to 4 (1 for *Strongly Disagree*, 2 for *Disagree*, 3 for *Agree*, 4 for *Strongly Agree*) is assigned to all the Likert questions present in the questionnaire, and the evaluation is satisfactory if the average value for all questions is at least 2. *Not Applicable* values are not considered for the evaluation. The questionnaire of a use case is considered to have a positive outcome if the following conditions are met:

- The average of answered questions is 3 or above.
- At least 80% of the questions have an average of 3 or above.

Moreover, all questions with an average value of 2 or below for a given use case should be analysed more in detail, as they indicate a potential problem in the software.

Open questions at the end of the questionnaire should be considered individually: although they do not affect the positive or negative outcome of the survey, they could provide useful insights for enhancing the DataPorts platform.

All answers will be anonymous, so no personal data will be asked, processed, or stored.

After all users have completed the survey it is possible to create a spreadsheet in Google Docs with all the answers given in the survey. The spreadsheet can afterward be exported in Excel or CSV format and processed to get the results of the evaluation.

It is expected that at least 5 questionnaires are answered for each use case, with 10 being the ideal value. Each use case evaluates its surveys individually.

### 3.2.4 Questionnaire

The questionnaire is based on the Technology Acceptance Model (TAM), which is widely used for information systems assessment [1].

TAM defines the following two main indicators: **Perceived Usefulness** and **Perceived Ease of Use**, to which it adds the dependent variable **Behavioural Intention**. Some TAM implementations also assess the Intention to Use indicator, however for this specific project it is not necessary, as DataPorts would either introduce new functionalities, or replace the systems in use, and not be an alternative to them.

Perceived Usefulness is defined as “the extent to which a particular person believes that using a particular system would enhance his or her job performance”. Perceived Ease of Use is defined as “the degree to which a person believes that using a particular system would be free of effort”. Behavioural Intention defines individual intention to engage in specific behaviour, in this specific case it would be to use a particular technology: the DataPorts system.

The survey groups the questions in the questionnaire into the three subsets just mentioned. The questions take into consideration the fact that some use cases involve data analytics, while others are dealing with concrete tasks which do not require data analysis. For this reason, the *Not Applicable* option is included in the answers set: for example, a use case might not involve the use of data analytics, and in that case the user should select the *Not Applicable* value when they encounter a question regarding data analytics.

Each question will offer a multiple-choice answer with the following values, out of which the users must choose a single option for each question:

- Strongly Disagree
- Disagree
- Agree
- Strongly Agree
- Not Applicable

Each question should be formulated in a way that, in the context of the evaluation, a higher value represents a positive outcome (such as the user perceiving the system as easy to use), and a lower value represents a negative outcome (e.g., the user does not understand how to use the system). This is necessary to easily evaluate the output of the questionnaire afterwards. All questions should be answered.

The survey covers the four pillars of DataPorts:

1. Data Sharing and Trading
2. Data Governance
3. Security
4. Data Analytics

The following is a draft proposal for a questionnaire to evaluate the DataPorts use cases. It could be modified after the use cases have been defined to cover aspects which could be added in the future, or it could also be necessary to define multiple questionnaires and use different ones for different use cases: in both cases the Deliverable D5.5 will contain the updated questionnaires, which will be defined after the use cases are finalised.

#### Perceived Usefulness

1. I think using the platform would help me perform my daily activities.

2. I think the platform is better than the one offered by the current solution.
3. Using the platform would allow me to work with a higher degree of security with respect to the current solution.
4. Using the platform would allow me to access a higher volume of data with respect to the current solution.
5. Using the platform would allow me to have access to more data sources with respect to the current solution.
6. Using the platform would allow me to access more services with respect to the current solution.
7. Using the platform would allow me to better manage data and information with respect to the current solution.
8. Using the platform would allow me to share a larger amount of data with other partners with respect to the current solution.

#### **Perceived Ease of Use**

1. The interface of the platform is clear and intuitive.
2. I found it easy to perform the required tasks using the platform.
3. It is easy to find the information needed in the platform.
4. The data and analysis results presented by the platform are easy to understand.
5. It would be easy for me to become skilful at using the platform.

#### **Behavioural Intention**

1. I like the idea of using the platform.
2. I believe it is a good idea to use the data platform of the platform to manage operations.
3. I believe it is a good idea to use the data analytics of the platform to manage and better planning operations.

In addition to the previous questions, the survey provides the following two open questions, which provide a way to report issues or offer recommendations:

- Did you have any issue while using DataPorts? Did you find anything not clear?
- Would you recommend any change to the platform?

## 4 ROADMAP

The evaluation will take place after the first version of the software is ready. There will be two evaluation iterations for requirements and use cases during the project to allow enough time to perform adjustments and bug fix tasks after the evaluation process. The survey will be handed out towards the end of the project.

Figure 1 shows the GANTT of the evaluation roadmap. For readability’s sake, the first 9 months of the project have been removed from the diagram, as no activity related to evaluation happen in that period. Task T5.5 is broken down into its sub-tasks: requirements and use cases are considered together in Section 4.1, as their evaluation is performed in the same manner; Section 4.2 details the roadmap for the user acceptance survey.

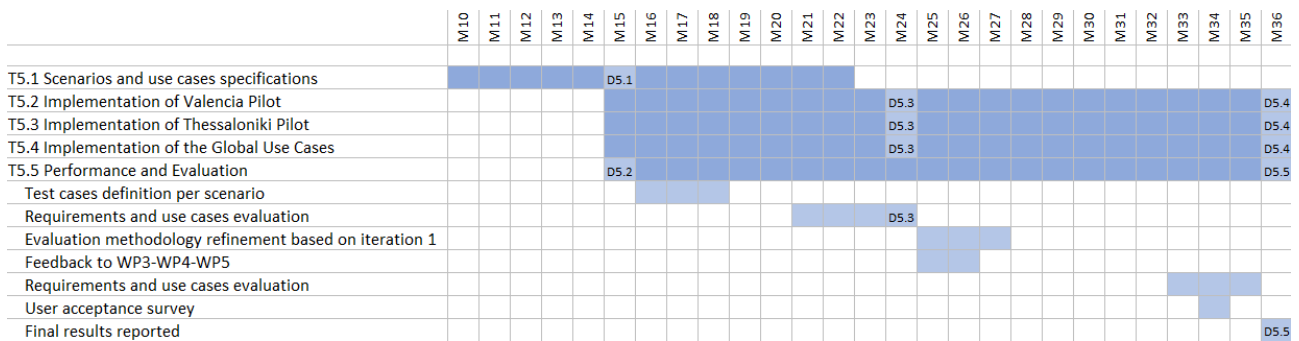


Figure 1 - Evaluation Plan Roadmap

### 4.1 REQUIREMENTS AND USE CASES

Despite having requirements and use cases taken in consideration and tested during the whole development of the project, the two evaluation offer the possibility to formally verify them, producing an important input to the development in the case there were changes to be made to the project. In both cases, the evaluation process is assumed to last 3 months to have the required time to analyse the obtained data and fill in the corresponding documents.

The first step of the evaluation plan is to define the test cases necessary to evaluate DataPorts scenarios. This task will be performed between M16 (April 2021) and M18 (June 2021), and the test cases will be included in Deliverable D5.3.

The preliminary evaluation of requirements and use cases will take place between M21 (September 2021) and M24 (December 2021), after the first version of the DataPorts platform is developed. The results of this evaluation will be included in Deliverable D5.3, which is due M24.

After the preliminary evaluation there will be two additional tasks to perform: The first is to refine the evaluation methodology (M25 to M27): the results of this analysis will be included in D5.5. In parallel, during M25 and M26, the feedback obtained from the evaluation will be given to WP3, 4 and 5, which will use it to refactor the software to achieve a better quality.

The second evaluation of requirements and use cases will take place between M33 and M36 (September 2022), when the software should be ready for review and delivery. The results of the second evaluation will be included in Deliverable D5.5, which is due M36.

### 4.2 USER ACCEPTANCE SURVEY

The survey will be handed out during M34 (October 2022). By the end of the month all surveys should be completed and processed to generate the insights.

Although they are not scheduled yet, there are two forecasted events, in Thessaloniki and Valencia ports, where users could test the platform and fill out the survey. This could provide a better feedback on the quality



of the DataPorts platform with respect to having users fill in the survey remotely, as the questionnaire could be handed out right afterwards the presentation of the platform, thus achieving a higher engagement.

## 5 CONCLUSIONS AND NEXT STEPS

The main goal of this deliverable is to provide a clear evaluation plan and a timetable to practically conduct the evaluation of the project. This document describes the evaluation plan for DataPorts, divided in the two scopes of requirements and use cases.

The evaluation of requirements and test cases will confirm that the DataPorts implementation respects all requirements and that the software works correctly, while the user acceptance survey will measure the usability of the platform and the satisfaction of its users.

Requirements and test cases will receive two evaluations: one after the first version of the software is released, and the second towards the end of the project, together with the user acceptance survey. The results of the preliminary evaluation will be included in Deliverable D5.3 (M24), while the results of the final evaluation will be reported in Deliverable D5.5 (M36).

If any of the evaluations fail, all relevant partners must address the corresponding problems and provide an updated version of the DataPorts platform which does not present the identified issues anymore. The preliminary evaluation is expected to report some failures in the evaluation process, as the software version is not yet the final one. The outcome of the final evaluation is expected to be positive, however there is an extra month of buffer to perform last-minute updates to the platform.

As for the next steps, the definition of Use Cases is not yet complete at the time Deliverable D5.2 is due at month 15. This document refers to Deliverables D5.1, D5.3 and D5.4 to access DataPorts Use Cases description and test cases, which must be defined in these deliverables before the evaluation can take place.

To evaluate the user acceptance, we either need to define a specific survey for each of the use cases of DataPorts, or to define a single survey which covers all the aspects of the different use cases. This task is to be performed after the specifications for all the use cases have been finalized.

Finally, a pending task is to monitor DataPorts events that will happen in the future and understand whether it would be possible to fill out the user acceptance surveys during at least one of them.

## 6 REFERENCES AND ACRONYMS

### 6.1 REFERENCES

[1] F. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Quarterly*, pp. 319-340, 1989.

### 6.2 ACRONYMS

Acronym List	
CA	Consortium Agreement
DoA	Description of Action
TAM	Technology Acceptance Model
WP	Work Package

**Table 6 - Acronyms**