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Abstract:

The DataPorts platform aims to become the standard data platform for seaports in Europe. A well-defined scaling strategy and close collaboration with strategic initiatives are required to reach this ambitious goal. This document presents the development of the strategic activities and pillars to scale up on European level. Furthermore, the status of the collaboration with the strategic initiatives is presented.

Keywords:

Scaling Strategy, Scaling activities, Strategic Initiatives, IDSA, Certification, Roadmap

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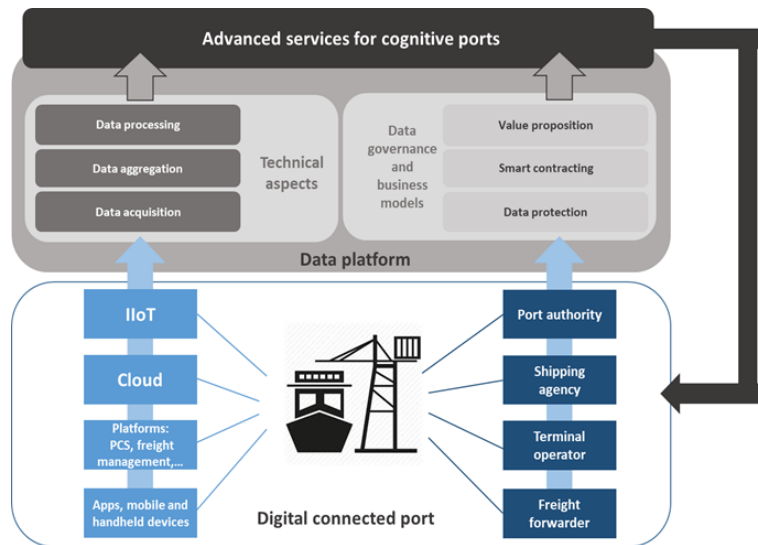
1 INTRODUCTION

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 ITI - Technological Institute of Informatics. 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 report will collect all activities carried out in the scope of T6.3 and T6.4, involving community building, initiatives contacted and engaged and level of adoption of the platform by other actors.

DataPorts main goal is to become the de-facto standard data platform for seaports. For this purpose, several communications and collaboration activities need to be carried out to increase the awareness and the attraction of DataPorts. This approach requires an agile but also clearly defined workflow. Therefore, this document focuses on a strategic and an operative construct to scale up DataPorts on a European level. The strategic part describes the scaling direction to increase the appeal of DataPorts in Europe, while the operative part concentrates on the predefined collaboration with linked projects. In contrast to the strategic part, the scope of the operative part is clearly defined and determined by the limits of the collaboration with linked projects (see task 6.3). The strategic part covers a consideration area outside these limitations.

The purpose of the document is to define and interact with strategic initiatives which can provide further awareness about DataPorts. Furthermore, appropriate certificates for DataPorts were selected for building

trust in the DataPorts platform. In section 5 the document describes the status of the collaboration with the linked projects.

1.3 DELIVERABLE CONTEXT

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

Primary Preceding documents:

- 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.

Primary Dependant documents:

- D6.4 Report of clustering activities and scaling-up M12: First deliverable of tasks 6.3 and 6.4

1.4 DOCUMENT STRUCTURE

This deliverable is broken down into the following sections:

- **Section 2** provides an overview about the roadmap for DataPorts scaling strategy.
- **Section 3** describes important strategic initiatives and their possible engagement scenario.
- **Section 4** lists and selects required certificates for DataPorts platform.
- **Section 5** provide an update on clustering activities.
- **Section 6** summarize the deliverable and provide insights in the upcoming tasks.

1.5 DOCUMENT DEPENDENCIES

This document's content builds on the content of the first deliverable for Tasks 6.3 & 6.4. This is the second version, which is going to be delivered in M24. There is a further advanced deliverable planned for M36.

2 ROADMAP FOR DATAPORTS SCALE UP

In our previous deliverable we focused on the development of the DataPorts Scaling Strategy covered by the strategic pillars and roadmap. For each pillar several activities were planned and prioritized on a timeline. In the following sections the areas of focus for 2021 are explained and the upcoming activities are described.

2.1 AREAS OF FOCUS FOR DATAPORTS SCALE UP IN 2021

The roadmap for the scaling strategy is visualized in Figure 1. The focus for 2021 relied on the activities of Engagement in Strategic Initiatives and Certification of DataPorts Platform. The main goal of these activities is to increase awareness and build trust around DataPorts. The activities were organized as follows (Table 1):

Strategic Initiatives	<ul style="list-style-type: none"> - Engage with IDSA and GAIA-X AISBL - Market research for other ports specific initiatives - Choose and interact with initiatives based on market research
Certification of DataPorts	<ul style="list-style-type: none"> - Market research for trustworthy certifications (standards and regulations) for platforms - Acquire IDS-Ready certificate - Select and acquire suitable certifications for DataPorts

Table 1: Overview of DataPorts task 2021

With the engagement in IDSA (see 3.1) and GAIA-X (see 3.2) DataPorts is able to get the attention of the data space communities. Nevertheless, further ports specific initiatives are required to gain transparency over possible collaborations. These will be contacted for further collaboration (description in Chapter 3).

The certification of DataPorts is a required step to provide a trusted platform. For this purpose, several certifications were identified, requirements for the IDS-ready certificate were elaborated and suitable certifications were selected among the consortium partners (description in Chapter 4).

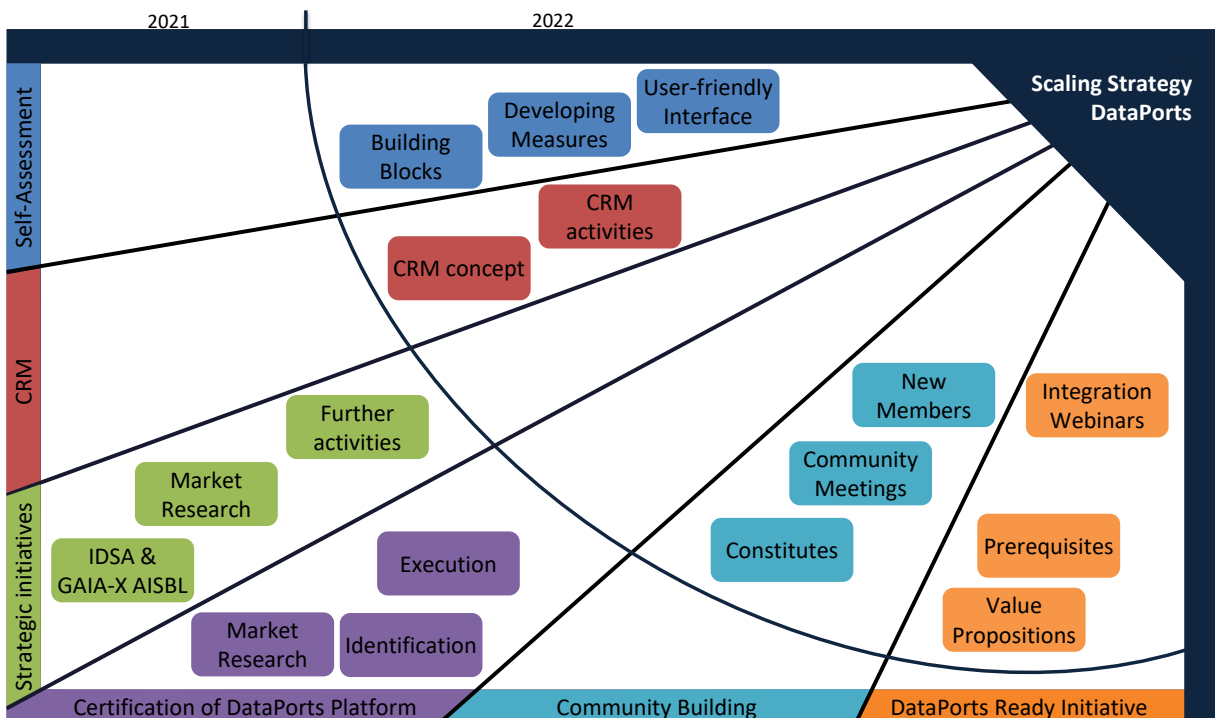


Figure 1: Roadmap for the scaling strategy of DataPorts

2.2 BACKGROUND

The activities to realize a de facto standard for seaports via the DataPorts project require a self-accelerating control loop. For this purpose, we have defined a scaling loop with various scaling activities (see Figure 2). Here, several activities need to be carried out in the long term and to be supported from all three directions (Community, Platform Ecosystem, Trends & Innovation). In the *Platform Ecosystem*, the various stakeholders are attracted and getting started is made as easy as possible with various measures, such as self-assessment. The *Community* is promoted through special activation for data providers and involvement in strategic initiatives relating to the topic of data spaces. The Community includes, among others, the participants of the Platform Ecosystem, but also many other interested parties that do not interact with the DataPorts platform or even operate in completely different subject areas. These can be open-source communities, strategic initiatives, or even groups of interested parties among potential customers. With *Trends & Innovation*, DataPorts ensures that the ecosystem is constantly aware of the latest innovations and is thus an accelerator for the community and platform. Trends & Innovations summarizes the innovation capabilities of DataPorts and the Platform Ecosystem. Examples can be the activities around future compatibility or the innovation ecosystem. These objectives ensure that DataPorts gets a 360-degree view of the collaboration between different actors and activities. It is worth noting that these activities do not end with the project. Rather, these activities are to be addressed beyond 2022. The elaborations within the deliverables D6.4 and D6.10 provide the foundation such as CRM Concept, Community Building, or Self-Assessments.

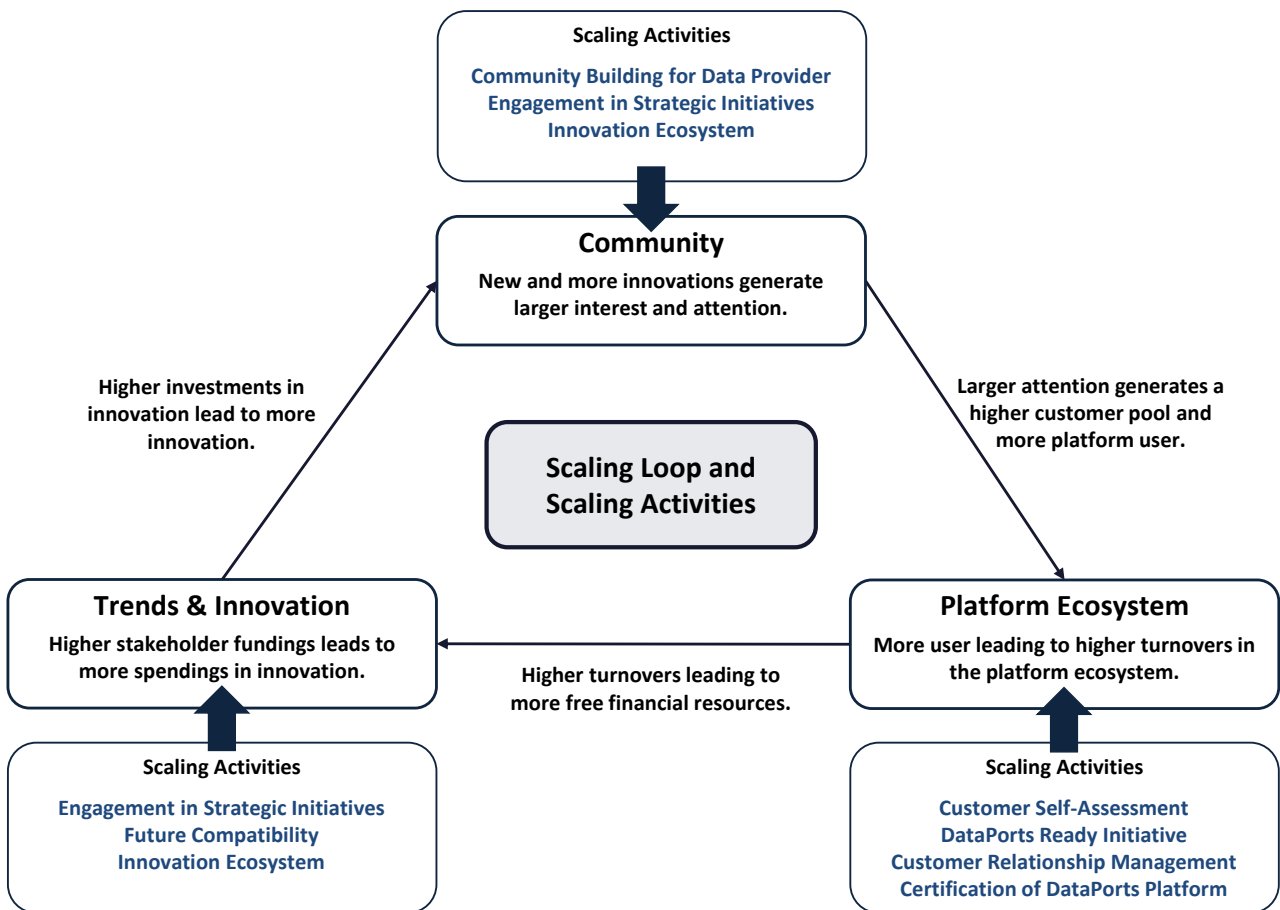


Figure 2: Scaling Strategy Overview

3 ENGAGEMENT IN STRATEGIC INITIATIVES

As explained in section 2, one activity for scaling the DataPorts platform involves engagement in strategic initiatives. On the one hand, this activity creates a communication channel for the respective target groups. On the other hand, the placement in strategic initiatives can be used to gain valuable information from these networks. This information can then be used to coordinate DataPorts activities and exploit optimization potential. Placement in various strategic initiatives also makes it possible to address different customer groups and view them as potential customers/stakeholders.

A strategic initiative is a program that provides the framework for various large and small projects within the respective program. In these initiatives, predefined goals and projects are realized with the targeted use of funding. Strategic initiatives are not tied to specific regions and can be carried out on both regional and global levels. By building strong networks, developments are accelerated, and new ideas are realized through synergies.

For placement in a strategic initiative to be used to scale the DataPorts platform, it is advisable to select strategic initiatives based on the same properties. For this reason, the strategic initiatives are categorized according to the following criteria:

- Open Source
- Blockchain Technology
- Data ecosystem
- Data platform

The pre-selection results in 10 strategic initiatives, which have both a maritime and a neutral background (an overview is given in Appendix A: Survey of potential strategic initiatives). These initiatives are characterized in tabular form, considering the questions “What”, “How” and “Why”. This overview is reviewed by partners and evaluated for relevance. The selection of the initiatives to be considered takes into account the time aspect as well as the short-term benefit. The placement of DataPorts in the initiatives presented later, should take place in the coming weeks or months. Due to existing connections with the respective initiatives, the placement in these initiatives can be advanced faster. In addition, it can be seen in Figure 3 that the initiatives presented have a similar background and create a broad network of participants. In the following sections, the final selected strategic initiatives are described in detail. Furthermore, we explain why the respective initiative is appropriate for the scalability of the DataPorts platform and how it is placed in it.

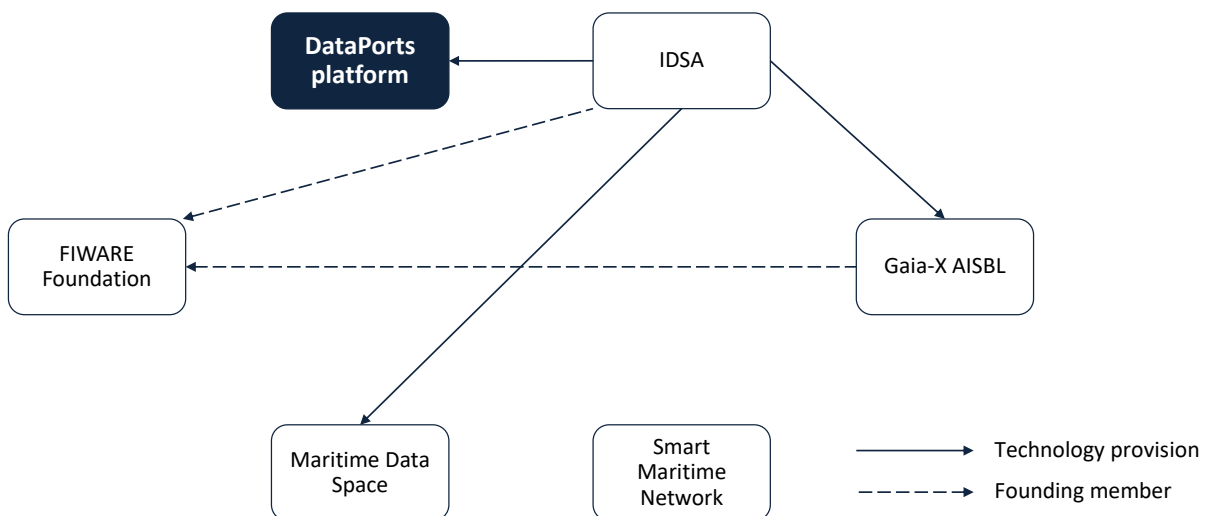


Figure 3: Connection of the Initiatives and DataPorts

3.1 INTERNATIONAL DATA SPACE ASSOCIATION

Members	IDSA Hubs	Countries	Use Cases
+120	8	22	+55

Table 2: Facts International Data Space Association

Introduction to the initiative

The foundation of the International Data Space Association (IDSA) stems from the International Data Spaces (IDS) initiative. The object of this initiative was to establish a virtual data space that enables the secure exchange of data and ensures the digital sovereignty of data owners [1]. To this end, the IDS developed a reference architecture model [1]. Since 2016, IDSA has been pushing the IDS reference architecture model as an international standard for data sovereignty [2].

The secure exchange as well as the linking of data are realized by means of the IDS architecture, which is based on collaborative governance models. This architecture ensures the digital sovereignty of the data creators and thus forms the basis for smart services and innovative business processes. The realization of these services and processes requires a strong incentive for data exchange. This is done via a European initiative that ensures data sovereignty via digital infrastructure components and a uniform interoperable format in a competition-neutral and cross-industry manner. Certified users gain access to the software architecture via IDS gateway software, the IDS connector. These users are given the ability to tag data with terms of use and implement self-determined data exchange between trusted partners. The IDS connector uses container technology. In this, data is secured against unauthorized access and manipulation. Furthermore, the corresponding data can only be used within the container under the previously agreed conditions. The IDS connector can be used on classic servers, in cloud environments, on IoT devices or smartphones [3].

Before IDS, there was a lack of a global and interoperable standard for describing and exchanging data. With DIN SPEC 27070, which was published in November 2019, the IDS solves a global general market problem. More than 120 members from 22 countries are now participating in the initiative. The initiative is thus European as well as international in scope. IDSA is in constant exchange with global initiatives, such as the Industrial Internet Consortium, OPC Foundation, Robot Revolution Initiative and Big Data Value Association. In addition, the IDSA participates in various EU research projects to anchor the IDS architecture and data sovereignty standards in European digitization strategies. Already 8 countries have been able to achieve contractually bound IDSA hubs to drive the standardization and adaptation of the technology in their own countries. Further information can be found on their website (<https://internationaldataspaces.org/>).

Relation to DataPorts

With its placement in the IDSA initiative, DataPorts becomes a member of an established European network for data security and data sovereignty. Thus, DataPorts can benefit not only from the technology but also from the industrial reach of the initiative. In return, the DataPorts platform will provide a complement to the services currently available to the industry. Contact with the IDSA initiative will soon be made.

3.1.1 Data Space Radar

One activity to achieve visibility within IDSA is through the Data Space Radar (Figure 4). Here, a large number of initiatives and projects are listed that are related to data spaces and have an added value to the increasing trend of data spaces. This radar is divided into different sectors (Smart City, Manufacturing, Energy, Mobility, Automotive, Supply Chain, Cross-domain/other) and differentiated in terms of maturity (Lead-In, Case Committed, Pilot, Live). Overall, there is only one Data Space that covers the Maritime domain - the Maritime Data Space. This offers the opportunity for DataPorts to position itself more strongly beside the Maritime Data Space.

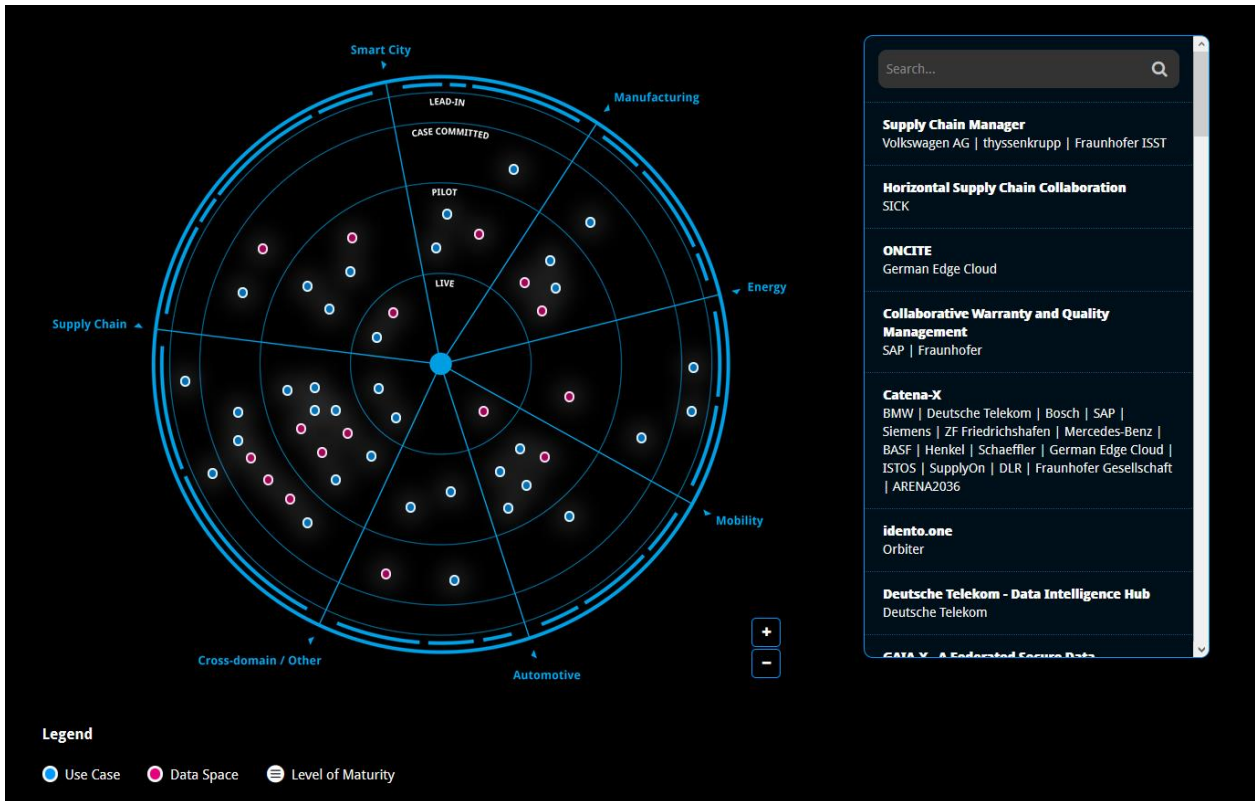


Figure 4: IDSA Data Space Radar¹

Relation to DataPorts: DataPorts has registered as a new use case at this point and is waiting to be accepted as a use case for the Data Space Radar. Initial discussions indicate that DataPorts will be listed here. This will give DataPorts more awareness and thus create synergies with other Data Spaces.

3.1.2 IDS Communities

In addition to the Data Space Radar, there are four communities in the IDSA (Figure 5): Industrial, Mobility, Logistics, and Medical. Each community aims to establish technologies, methods, organizational structures and governance of the IDSA in a domain-specific approach. The concepts differ depending on the requirements of the domain. A community has to unite five goals. First, it should represent stakeholders from industry, research and organizations. Secondly, they describe the use cases with their concepts and technologies. Thirdly, the requirement to compare these use cases with the IDS Functional Overview. Fourthly, the results need to be validated with the Reference Architecture Model. Fifthly, show the possible benefits for their data space implementation.



Figure 5: IDSA Data Space Communities²

¹ Source: internationaldataspaces.org

² Source: internationaldataspaces.org/make/communities/

Relation to DataPorts: The IDSA community approach results into two options for DataPorts - joining an existing community or creating a new community.

For entry into the existing community, the Logistics Community is valuable because several industry partners bring in new idea which can be adapted by DataPorts (e.g., develop services or adapt business models ideas). Another approach would be to establish a Maritime Community. There are isolated initiatives in Europe that are setting up a data space for the Maritime. However, these are not currently bundled into an overarching Maritime Community. Existing initiatives such as the "Maritime Data Space" (see 3.4) are developing solutions for specific ports. From the point of view of the European ports, overarching work is to be advocated. First contacts have already been made to align with other initiatives.

Both approaches would lead to an increased awareness in the IDSA, whereby the establishment of an own community would have the greater leverage. The downside is the focus on the IDS Concept and its implementation. For DataPorts, this represents only a building block for data sharing, but is not central to the development of the overall platform.

For the next period, the strategic building block "Community Building" is planned. Here, further activities are planned, and the community approach will be focused more strongly.

3.1.3 IDS-ready

Every organization can be certified by the IDSA. Depending on the focus of the use case, a distinction can be made between different certificates. For DataPorts, such certification would be of great importance, as it would strengthen trust in the platform. Therefore, the IDS-ready certificate is an essential part of section 4. Further information can be found in this section.

3.2 GAIA-X AISBL

Members	Organisation	Domain Working Groups	Gaia-X Hubs	Use Cases
+850	+425	10	15	+65

Table 3: Facts GAIA-X AISBL

Introduction to the initiative

In 2020, 22 members founded the European data infrastructure GAIA-X. The goal of this infrastructure is to fully exploit the value creation potential of existing data in European companies. Considering the aspects of data availability, interoperability, portability, data sovereignty and transparency, the construction and operation of this infrastructure is carried out [4].

The Gaia-X architecture is based on the principles of decentralization. In a federated system, a network of providers and users is created. Building an ecosystem creates a trusted environment to provide, collect and share data. The central elements of the Gaia-X ecosystem are Federation Services, Data Spaces, Standards, and Services [5]. Federation Services are minimum technical requirements and services necessary to use the Gaia-X Ecosystem. General frameworks are used to provide and use standardized technologies. Open-source software represents one of these technologies [6]. The term data space describes a data relationship between trusted partners. Data is stored and used in accordance with predefined and agreed terms of use [7]. The data is not stored centrally, but in the actual data source (on premises). If necessary, they are shared via semantic interoperability. The basis of this function is a reference architecture model of the IDSA. So far, there are data rooms for the topics Industry 4.0/Small to medium-sized enterprises, Health, Education & Skills, Energy, Mobility, Finance & Insurance, and Space. Standards are another core element of the Gaia-X Ecosystem [8]. A key component of the Gaia-X initiative is the definition of a standard architecture that aligns existing standards and codes of conduct. These standards include regulatory standards, industry-specific standards, and technical standards. The development of these standards includes the definition and enforcement of data usage policies. Members of the Gaia-X ecosystem are required to follow the principles

and guidelines. The last core element of the Gaia-X ecosystem comprises services [9]. New digital services will be developed as part of the project. With transparency, security, and interoperability in mind, a variety of teams are working to define standard processes, rules, and requirements necessary to develop new services.

The initiative Gaia-X European Association for Data and Cloud AISBL represents as a non-profit association the core of the organizational structure of the Gaia-X vision. The goal of the association is to lay a foundation for future data-based innovations, to set standards and to exchange knowledge. Gaia-X Hubs have already been formed in 15 countries to promote the use of the Gaia-X ecosystem in their countries. Further information can be found on the website (<https://www.gaia-x.eu/>).

Relation to DataPorts

The goal of Gaia-X is to establish a pan-European standard of a data infrastructure. The core elements mentioned are essential drivers for the realization of this goal. For the DataPorts platform, a placement in this initiative is appropriate: to be a member of a huge network on one side and to orientate itself on the development of the ecosystem on the other side. Gaia-X as well as the DataPorts platform enable data-secure and data-high exchange. Therefore, synergies can arise during cooperation and interests. By placing DataPorts in the Gaia-X AISBL initiative, both data providers and data users can be gained. Also, contact will be made here soon.

3.3 FIWARE FOUNDATION

Members	Fiware iHubs	Countries
+415	+21	+45

Table 4: Facts FIWARE Foundation

Introduction to the initiative

The FIWARE Foundation is an open-source initiative founded in 2016 as a non-profit association by Atos, Engineering, Orange, and Telefónica. FIWARE started as a European research project funded by the Future Internet Private Public Partnership (FI-PPP) program. The aim of this program was to promote European competitiveness in digital technologies and to develop a new European Cloud platform. [10]

FIWARE aims to develop sustainable business models by avoiding vendor lock-in scenarios. With the help of the FIWARE Foundation, a global community is initiated, whose members are committed to realizing the FIWARE mission. This includes building an open, sustainable ecosystem based on public, royalty-free and deployment-oriented software platform standards. This facilitates the development of new smart applications in various fields. [10]

FIWARE realizes the development of intelligent and cost-effective solutions by providing a curated framework of open-source software platform components. These components can be combined with third-party components to build platforms. The single and thereby also most important mandatory component of any "Powered by FIWARE" platform or solution is a "FIWARE Context Broker Generic Enabler". This represents a required basic function for every intelligent solution, namely the management of context information, the execution and updating as well as the access to the context. The API exported by the Context Broker, FIWARE NSGI, is used to implement this basic function. [11]

The FIWARE Foundation is a legally independent non-profit organization that drives the definition of open standards and promotes their adoption. Meanwhile, more than 415 members from over 45 countries have joined the initiative. The synergies from strategic partnerships with e.g., ETSI (NGSI-LD API specification), W3C (Web of Things), GSMA (IoT Big Data Ecosystem project) as well as TM Forum, have led the work of the Foundation in the field of standardization to stable results. Further information can be found on their website (<https://www.fiware.org/foundation/>) [12].

Relation to DataPorts

Despite the business restrictions imposed by COVID-19, the FIWARE Foundation has achieved outstanding growth results. FIWARE iHubs are located in various countries, from South America to East Asia. They help companies as well as individuals to build a network of technology-oriented communities. Additionally, they support the creation of Internet-based businesses on both local and international levels. FIWARE is demonstrating a major impact on smart cities. With the help of the FIWARE community, many cities have already been helped in transforming big data into knowledge, unlocking the potential of open data. DataPorts can leverage the experience and reach of the FIWARE community to gain broad insight into how the industry works, as well as access to new stakeholders. Equally here, too, the contact will be taken up in the near future.

3.4 MARITIME DATA SPACE

Members	Countries
6	+75

Table 5: Facts Maritime Data Space

Introduction to the initiative

The range of cloud-based services and functions for specialized process steps in shipping operations and logistics is increasing daily. However, these offers are, in fact, often only isolated solutions that are implemented with a relatively high effort. In addition, only subsets of the fundamentally available data are included and handled with a lack of standard in terms of data security.

In 2018, the Maritime Data Space (MDS) initiative tackled the problem of providing data in a secure and cross-company manner for the development of digital business models in the maritime sector. Based on a digital representation of the ship (Digital Twin) and a networked infrastructure for these digital ships, they aim at driving the transformation of the industry. The goal of the initiative is to connect all companies that generate and/or process maritime data. In doing so, the data remains with its owner or provider and is only released for specific uses. Via a connector, the data-holding systems are integrated into the distributed infrastructure of the Maritime Data Space. The technical implementation is based on the IDS reference architecture model. [13]

The Maritime Data Space is an innovation project funded by The Research Council of Norway that offers data providers a network of maritime-specific data users. The use of IDS technology assures data providers of security and protection against data misuse. Based on this data, data-driven business models and new digital services can be developed. The Maritime Data Space is therefore not only a secure area for data exchange, but also a space for innovation. [14]

The project is a collaboration between NAVTOR, Wilhelmsen Ship Management, Veracity by DNV, Neuron Solution and SINTEF. Wilhelmsen Ship Management is providing its knowledge and experience as a ship management company for this project and will validate the developed solutions after the end of the project (2021). The goal of this venture is to develop new and innovative services for information provision and to design an efficient and effective exchange between customers. The responsibility of the project lies with the company NAVTOR. This company contributes to the development of automated reporting and onboard infrastructure. Automated data collection and sharing motivates the company to participate in this project. The Veracity Ecosystem is provided by the company DNV for data sharing and exchanges as well as for the support of infrastructure for analytics. Together with the IDS community, Veracity aims to promote the strengthening of international standards. The technology partner, Neuron Solution, provides an architecture for data collection, especially for data provisioning and MDS data transfer solutions for onboard data sources. SINTEF is providing its experience and expertise in R&D in the field of shipping and ship management as well as international standardization (such as Shipping KPI and information exchange) as project manager.

Further information can be found on the website (<https://www.sintef.no/projectweb/maritime-data-space-mds>). [13]

Relation to DataPorts

In addition to the strategic initiatives mentioned above, the Maritime Data Space is an initiative specifically for the maritime sector and transport logistics. By placing the company in this initiative, customers and stakeholders from this sector can be specifically addressed. A cooperation with DataPorts enables an intensive examination of maritime-specific problems and challenges. Contact was made with a representative of SINTEF. The contact has resulted in positive feedback and they would like to discuss the state of the art and potential cooperation with DataPorts.

3.5 SMART MARITIME NETWORK

Members
+30

Table 6: Facts Smart Maritime Network

Introduction to the initiative

The Smart Maritime Network is a strategic initiative positioned in Dublin, Ireland, which was founded in 2019. The aim of this initiative is to develop a platform for the formation of a knowledge sharing network in the maritime sector as well as in the field of transport logistics. For one thing, improved integration of actors as well as the exchange of data between these actors can take place on this platform. Furthermore, the industry can be informed about technological developments and innovations. [15]

A website has been set up to provide access to relevant industry news, interviews and further information on new technologies and processes. The goal of this website is to generate a knowledge database. By means of various events, the current reach of this knowledge network will be extended. In addition to the website, a Smart Maritime Council will also be established. The council includes cross-industry partners, among them maritime technology developers and system integrators. In a series of meetings, topics such as compatibility, standardization and harmonization of technologies used in the modern maritime industry will be discussed. Among the members are also end users of the platform, such as ship operators. With their help, their perspective can be considered in the development of maritime technologies. [16]

Due to the COVID-19 pandemic, the activities of the Smart Maritime Council had to pause but were resumed this year. Conferences have already been held in Athens, Copenhagen, and Dubai. The next one will take place in Singapore in January 2022. Further information can be found on their website (<https://smartmaritimenetwork.com/>). [17]

In 2020, four conferences were attended by over 700 participants [18]. It can be assumed that there are potential customers among this number of participants. Collaboration with this network would provide access to this reach. Furthermore, the DataPorts platform can be placed in the Smart Maritime Network knowledge bank to draw attention to itself, providing innovations as well as services. Conversely, DataPorts receives first-hand information about new technologies and innovations through the Smart Maritime Network.

Relation to DataPorts

The Smart Maritime Network is also an initiative from the field of maritime logistics. The initiative's reach extends worldwide. Collaboration with this initiative will provide DataPorts with insight into innovative global services and developments. In addition, DataPorts could make its services and offerings available for international use in the future. Contact has already been established here as well. Further steps will be taken depending on the feedback.

3.6 FURTHER ACTIVITIES POST 2022

Engagement in the above strategic initiatives is a subtask of the scaling strategy for the DataPorts platform (Figure 1). The scaling strategy will be implemented when the project ends in 2022. After the project ends, the task of scaling must continue so that DataPorts can continue to attract new data providers as well as data users to the platform. As a result, there is a need to assign a person or team the responsibility to monitor and manage the scaling of the DataPorts platform.

The responsibilities of this role include, first, reviewing the aforementioned and future initiatives. These initiatives are key drivers for the scaling of the DataPorts platform. In addition to providing important information for the development of new services and technologies, these initiatives provide DataPorts with a communication channel to new stakeholders.

Another task of this role includes the collaboration with these initiatives. Only through an exchange of knowledge and active collaboration services and offerings can be aligned with the needs of customers.

Placement in a strategic initiative also provides a means of communication to potential customers. Therefore, in the future, information about DataPorts must be made available within these initiatives. Producing and/or collecting shareable information about new offerings and services is an additional task.

In summary, the following tasks arise for the time after the end of the project in 2022:

- IDSA
 - Reaching out to the IDS Logistics Community
 - Development of a communication strategy
 - Integration of the DataPorts platform and its services
- Gaia-X AISBL
 - Reaching out to the open-source Gaia-X Community
 - Development of a communication strategy
 - Integration of the DataPorts platform and its services
- Fiware Foundation
 - Reaching out to the Fiware Foundation community
 - Development of a communication strategy
 - Placement of the DataPorts platform and its services
- Maritime Data Space
 - Reaching out to the MDS Community
 - Development of a communication strategy
 - Exchange on challenges and solutions for the maritime sector
 - Placement of the DataPorts platform and its services
- Smart Maritime Network
 - Reaching out to the SMN Community
 - Development of a communication strategy
 - Investigate the community to derive new services
 - Creating DataPorts-related content for the knowledge network

4 CERTIFICATION OF DATAPORTS PLATFORM

As one of the fundamental pillars of the Scaling Strategy and an important milestone in the roadmap for DataPorts, certification takes a centre stage. The following section discusses the goals pursued with the certification of DataPorts, how certification works, and the influencing factors. Based on this, an overview of possible certificates is given, from which a goal-oriented selection is made with the participation of the DataPorts consortium. Finally, a roadmap is drawn showing how the actual path to certification of DataPorts will be taken.

4.1 CERTIFICATION BASICS

For a general understanding of the topic of certification, we will discuss what certificates are, how they work, and how to obtain them. We will then explain what the goals of a certificate are, in general, and how this can be applied specifically to DataPorts.

What is a Certificate?

A certificate is a type of attestation or deed, by which compliance with certain requirements is demonstrated and usually awarded for a limited period of time. Although they have the same conceptual origin and similar purposes, certification in this sense must be distinguished from the same term in cryptography or finance, as these describe other types of certificates. Certification is clearly regulated and standardized internationally and is integrated into comprehensive processes. It is a sub-process of conformity assessment (ISO/IEC 17000) and is usually awarded by an external organization. These organizations can issue certificates for applicable standards (ISO, IEC, DIN etc.) or check individual requirements they have set themselves.

What gets certificated?

Products and services, associated processes and relationships, people, systems and companies can be certified. As a rule, international, European, national or industry-specific standards are used for the respective areas.

Who does certification?

As a rule, certification is carried out by certification bodies (e.g., TÜV and Dekra). These are usually private companies that require accreditation (ISO/IEC 17011:2018-03) (further important for certification bodies: ISO/IEC 17021, ISO/IEC 17024 and ISO/IEC 17065). For example, in Germany accreditation is granted by the Deutsche Akkreditierungsstelle GmbH (DAKKS), which assumes the function of an authority and is under the control of the federal states, the federal government, and the Federation of German Industries.

How does a certification process work?

In general, there is nothing like a standardized certification process. Nevertheless, it is possible to divide the path to certification into certain phases and work steps, which represent a framework in most cases. By looking at the processes, the way to certification can be broken down into three core phases with several sub-processes (Figure 6):

1. Internal conformity testing

In the first step towards certification, the goal is to bring the company's processes in line with the requirements of the respective certificate. For certificates that certify standards, these requirements are clearly defined in the corresponding standard documents and can be independently viewed by the organization. This is also the variant on which this process is mainly oriented. Other variants will be discussed further in section 4.2. [19]

Based on the selection of the certificate, the process begins with the analysis of the requirements. Based on this, the conformity of the organization's own processes with these requirements is sought

through internal project planning and checked in internal conformity tests/audits. Here, an internal control loop is formed (often according to PDCA scheme) to achieve these goals.

2. Conformance testing / Audit

The second step is the actual certification. Depending on the certifying organization and the certificate, there may be slight variations here, but the general core of this process step is the verification of conformity by an external certification organization. Here, external auditors come to the organization to be certified and check the corresponding requirements set in the standards. This can take several days to weeks, depending on the certificate and the size of the organization. A self-assessment is often completed beforehand to increase the chances of success and speed up the process. If the audit is successful, the organization is issued a certificate with which it can present the fulfillment of the standard to the outside world. Such a certificate usually has a certain duration, which in most cases is in the range of 2 - 5 years [19].

3. Re-certification

After the certificate expires, recertification is due in order to continue to demonstrate conformity with the relevant standards. This process usually consists of a streamlined version of the certification process and renews the certificate upon successful completion [19].

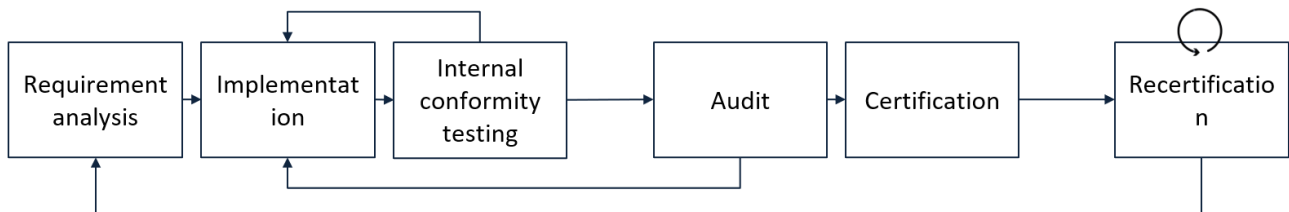


Figure 6: Certification process phases

Motivation

As already mentioned in D6.4, certification is an important instrument for scaling DataPorts on the market. The basic goals of certification are to create trust and acceptance among customers and partners by demonstrating one's own qualifications and providing proof of certain standards. In general, there are companies that require certain certificates from their partners for cooperation, without which cooperation is not possible. A good example of this is the automotive industry, where certain mandatory standards are imposed on suppliers by OEMs. Especially in digital areas, certificates are playing an ever-increasing role, as topics such as data security and General Data Protection Regulation (GDPR) compliance continue to increase complexity and requirements. Here it is particularly important to be able to prove compliance with these requirements to customers and partners.

For DataPorts, this makes certification one of the pillars on which the scaling strategy is based. This measure is intended to address the two core elements of scaling the platform. The first is the expansion of the reach, i.e., the acquisition of customers and partners, and the data revenue on the platform. The aim is to have a strengthening effect on both aspects through certification. The points described in the above paragraph apply at the level of increasing reach. By proving that DataPorts meets certain requirements, any potential barrier to the adoption of DataPorts by interested parties is lowered.

The impact on data turnover on the platform is expected to be even stronger than on reach. To increase data turnover, the group of parties actively sharing their data on DataPorts needs to be addressed. By proving certificates, DataPorts can demonstrate its trustworthy and transparent handling of this data. Compliance topics such as GDPR are also necessary requirements here for many customers. Through certification, DataPorts can address the risks of its customers and significantly lower the barrier to sharing and trading their own data on the platform.

4.2 OVERVIEW OF CERTIFICATIONS

Based on the theoretical principles and the objective of the certification of DataPorts, the selection of suitable certificates is carried out here. For this purpose, a rough framework for classifying the different certificates is first given. A selection of various certificates is then classified and evaluated. Through a survey within the consortium, a prioritization is then given, through which the targeted certifications for the DataPorts Roadmap are selected.

4.2.1 Certificate Framework

For the classification and rough evaluation of different certificates, a framework is necessary that summarizes the most important characteristics of the individual certificates. For this purpose, the certificates are classified based on their meta-factors and their objectives. For the evaluation of the meta-factors, the certificates are evaluated regarding their scope of validity, their reference and their certification process (Table 7). In the following, these factors are explained individually.

The *scope of validity* describes which parts of the world the corresponding certificate is recognized in and can thus effectively contribute to scaling. Since DataPorts is primarily a European solution, the focus here is naturally also on the European market. Nevertheless, against the background of further expansion and its establishment as a universal solution, other markets should also be considered.

The *reference* describes whether a certificate refers to a standard issued by a standardization organization or is based on requirements defined by the certification organization itself. For the first case, only the standard to be certified is mentioned in the following listing of certificates. This is usually certified by various organizations, which is why this is rather in the background here. In the second case, the certificate and the certifying organization are considered directly, as these are highly individual.

The *certification process* describes whether a certificate can be obtained through self-assessment, i.e., the company's own review of the requirements, or through an external audit. During the investigation, it became clear that although there are examples of certification through self-assessment (e.g., IDS Participant Certification, CSA Star Certification), these are often only part of multi-stage certification programs. Although they are valid on their own, they offer only limited significance. As a result, they do not play a relevant role for practical application, which is why the focus is clearly on certification through external audits.

Dimension	Characteristics			
Scope	EU	USA	Asia	International
Reference	Standards		Certification Organization	
Process	Auditing		Self-assessment	

Table 7: Certificate factors

For the objective of certification, individual categories were defined into which the individual certificates are classified. Since DataPorts is a digital platform, the focus here is also on digital topics. The topic of cloud certificates, in particular, was considered here in a particularly fine-grained manner, since it is not clearly defined which of the different service models DataPorts is best suited for. In addition to cloud-specific issues, other areas of general relevance for companies and organizations are summarized and briefly described below.

- **Cloud Systems**
Cloud computing describes a model in which on-demand shared computing resources are provided as a service. There are various service models that provide different services. The cloud system referred to here is the Infrastructure as a Service (IaaS) model, where only the computing resources

and storage capacities are provided. These are described in the next three objectives. The service models build on each other, whereby each additional one also includes the services of the preceding one [20].

- Platform as a Service (PaaS)
PaaS describes a service model in which a programming and runtime environment is provided in addition to the infrastructure. Flexible and adaptable computing and data capacities can be accessed here. The specific offerings differ from provider to provider [20].
- Software as a Service (SaaS)
SaaS describes a service model in which the provider offers access to software collections and programs. Traditional licensed software products are often supplemented or replaced in this way by their respective providers [20].
- Functionality as a Service (FaaS)
With FaaS, providers make certain frequently used functions available and thus outsource the computing capacity required for them [20].
- Data Security
Data security describes the protection of data against unauthorized access throughout the entire data lifecycle [21].
- Privacy
Data privacy describes the control over one's own data and how it is used. Privacy cannot be guaranteed without data security, which is why these areas are strongly interrelated [21].
- Management Systems
Management systems describe a framework of processes, rules and methods that are used to achieve all tasks and activities in an organization according to the objectives. There may be certain specializations, such as quality or environmental management systems [22].
- Compliance
Compliance describes conformity with rules. This applies not only to legal requirements such as the GDPR, but also to guidelines, voluntary codes, or internal company rules [23].

4.2.2 Certificates

Based on this framework, the researched certificates are classified and evaluated below (Table 8). The basis for the selection of the certificates are strategy papers of German and European authorities as well as the research for topic-specific certificates. This selection forms the basis from which a certificate baseline for DataPorts is developed with the involvement of the DataPorts consortium as well as responsible persons of the participating ports. In the following the term “Cloud+” means an objective on cloud systems plus several other service model levels.

Nb.	Certificate	Organization	Scope	Validity in months	Process	Objective
1	EuroCloud StarAudit	EuroCloud	EU	24	Audit	Data Security, Compliance, Cloud+
2	Trust in Cloud	SaaS-EcoSystem	DE	12	Self-assessment	Data Security, Privacy, Cloud
3	Trusted Cloud	TÜV Trust IT	EU	24	Audit	Data Security, Cloud, PaaS
4	Trusted Cloud Privacy	TRUSTe	Int.	12	Audit	Privacy, Compliance, Cloud+

Nb.	Certificate	Organization	Scope	Validity in months	Process	Objective
5	CSA Star	CSA	Int.	12	Self-assessment	Data Security, Cloud+
6	FedRaMP	FedRaMP Rheinlang	USA	12	Self-assessment	Data Security
7	EuroPrise	EuroPrise GmbH, Diverse	EU	24	Audit	Privacy
8	ISAE 3402/ SSAE 16	Diverse	Int.	6 - 12	Audit	Management Systems
9	ISO/ICE 27001	Diverse	Int.	36	Audit	Data security, Management Systems
10	IEC 62443	Diverse	Int.	12	Audit	Data Security, Privacy
11	NIST-800-53	Diverse	USA			Security, Privacy
12	BVDW Quality Certificate	BVDW	EU	24	Audit	Digital Services
13	ISO 9001	Diverse	Int.	36	Audit	Management Systems
14	Participant Certification	IDSA	EU	?	Self-assessment, Audit	Management Systems, Data Security
15	Core Component Certification	IDSA	EU	?	Audit	Data Security
16	Operational Environment Certification	IDSA	EU	?	Audit	Management Systems
17	ISO 27701	Diverse	Int.	36	Audit	Compliance

Table 8: List of Certificates

4.2.3 Survey

The selection of individual certificates for further tracking is under the control of the DataPorts consortium. For this purpose, in addition to work package leaders, representatives of the two participating ports of Valencia and Thessaloniki, in charge of certification, were consulted. A questionnaire was developed for the above list of certificates, which was evaluated and commented by the individual contacts. The result of the survey, discussed in the following section, is derived from the mean values of the individual feedbacks.

The concept of the survey is based on the framework developed for the certificates. Here, the respondents do not evaluate the certificates directly, but rather the certificate characteristics that, from their perspective, should be present in any certificate relevant to DataPorts. This ensures that competent answers can be obtained from the individual perspectives without the participants having to delve too deeply into the topic of the certifications. Within this framework (Table 9), respondents have the opportunity to rank the relevance of the individual characteristics on a scale of 1 (low) to 5 (high) and to provide supplementary comments. The result of this survey should be a prioritization of the individual characteristics of the certificates, based

on which a selection of certificates can ultimately be made by means of a cross matrix. In addition to feedback from the reviewers, attention will also be paid to synergies and suitable additions, which will be discussed in more detail in the following section. The full Survey Template can be found in Appendix B: Template Survey Certification.

No.	Question
1	How important is the certification of DataPorts for generating trust with customers in general?
2	Per definition compliance is not a part of certification, but there are huge intersections. How important do you rate the issue of compliance for DataPorts?
3	<p>Various Certifications have a different geographical scope. How important are the following regions for the success of a certification of DataPorts:</p> <ul style="list-style-type: none"> - EU - USA - Asia - International
4	<p>How important is the certification in the following areas for generating trust:</p> <ul style="list-style-type: none"> - Cloud Systems - Software as a Service - Platform as a Service - Functionality as a Service - Data Security - Privacy - Compliance - Management Systems
5	<p>Certificates can be issued according to various (international) standards (e.g., ISO, IEC) or individual requirements of accredited certification organizations (usually private companies). How important is a certification according to these two domains?</p> <ul style="list-style-type: none"> - According to standards - According to certification organizations
6	<p>Depending on the intended certificate and (sometimes) the certification level there are in general two different types of certification processes. On the one hand, you can get your certification by self-assessment, which usually produces a weaker certificate. On the other hand, you can get your certification by an external organization that conducts an audit in the target organization, which is usually more costly but generates a stronger certificate. How high do you assess the impact of each?</p> <ul style="list-style-type: none"> - Certification through self-assessment - Certification through audit

Table 9: Questionary Survey

4.3 SELECTION OF CERTIFICATIONS

By conducting the survey among consortium members, a prioritization for further commitment to certificates emerges. This section concludes by evaluating the results of the survey of eight participants and, based on them, making a selection for certificates that are particularly relevant to DataPorts. These certificates will be examined in more detail at this point and a roadmap for further action will be provided.

4.3.1 Survey Evaluation

The results of the survey provide a clear prioritization of the consortium members from their individual perspectives, through which an assessment of the certificates is possible. For this purpose, both the numerically recorded evaluation on the meta-factors, the objectives and further question points as well as the comments of the individual participants are evaluated. For the analysis of the numerically recorded data, a mean value was calculated on the basis of the recorded responses. On a scale of 1 (very low) to 5 (very high), this resulting value reflects the expected relevance of the corresponding property for the DataPorts scaling strategy. The detailed results can be found in 7.3.3Appendix C: Result Survey Certification; they are just summarized and evaluated here (Table 10).

A look at the meta-factors reveals a fairly clear classification by the respondents, for the most part. In terms of scope, there is a clear priority on the EU region. Among the other available regions, no clear tendency can be seen, but a further prioritization of internationally valid certificates is preferred. When considering the reference, the focus should be on certification according to standards. However, with a gap of only 0.5 points, a certification according to certification organization is not prioritized much lower. Depending on the individual certificate there is therefore some latitude here. The process is again clearly rated with a strong tendency toward certification by external audits, which also corresponds to the assessment from section 4.2.1.

Dimension	Characteristics			
Scope	EU 5,0	USA 2,6	Asia 2,6	International 3,8
Reference	Standards 4,0		Certification Organization 3,5	
Process	Auditing 4,5		Self-assessment 2,8	

Table 10: Certificate factors evaluation

A clear preference by the consortium can also be seen for the objectives. The topics of data security and privacy represent the focus for the targeted certificates. However, by looking at the individual evaluations of the members (Table 11), it can be seen that the spread is significantly greater than for the meta-factors. This is presumably due to the different professional perspectives of the participants. In combination with the comments on the individual fields, it can also be seen that the certification of management systems and compliance play a particularly relevant role for certain specialist areas. The prioritization of compliance topics is also underlined in other questions, which is a statement consistent with assumptions, given the background of DataPorts as a data platform. The exact data and anonymized comments on this are also available in Appendix C: Result Survey Certification.

Objective	Score
Cloud Systems	3,8
Software as a Service	3,4
Platform as a Service	3,8
Functionality as a Service	3,5
Data Security	4,8
Privacy	4,5
Compliance	3,6
Management Systems	3,9

Table 11: Certificate objectives evaluation

4.3.2 Certificate Selection

Based on the data from the survey, the intersection with the individual certificates can now be determined. In addition to the specifications from the analysis of the survey, the selection of the certificates is also based on the balance and complementarity between them. Possible synergies between the certificates are also considered. All in all, the selection of three to four certificates should result in a balanced overall picture that takes into account the priorities of the consortium and can effectively act as a pillar of the scaling strategy. Using the cross matrix resulting from the survey and the certificate framework, the following certificates were selected.

ISO/IEC 27001 and ISO/IEC 27701

Organization: Diverse, e.g., TÜV Nord

Objective: Data Security

Scope: International

Process: Audit

Validity: 36 months

The ISO/IEC 27001 is an internationally recognized standard and part of the ISO/IEC 27000 standard series published by the International Organization for Standardization and International Electrotechnical Commission. It defines the requirements for establishing, implementing, maintaining, and continuously improving a documented information security management system and the risk management related to information security management. It is applicable to any organization. The other parts of the ISO/IEC 27000 series are also relevant for the integration of the standard, especially ISO/IEC 27002, which gives recommendations for control mechanisms for information security - especially against attacks. This standard has many links to ISO/IEC 90003, which will be discussed in the next section. However, only ISO/IEC 27001 is relevant for direct certificate selection, as it is the only certifiable component of the standard series. As mentioned, ISO/IEC 27001 is a standard and not a certificate. However, there are numerous accredited organizations internationally that can verify and certify conformance to this standard.

The ISO/IEC 27701 is an extension to the ISO/IEC 27001 and covers data privacy issues. The standard provides requirements for establishing, implementing, maintaining, and continually improving privacy information management systems and sets a framework for Personally Identifiable Information (PII) controllers. It is thus important for addressing compliance and adherence to GDPR guidelines. An ISO/IEC 27001 certification is a precondition for its certification.

ISO 9001

Organization: Diverse, e.g., TÜV Süd, Dekra

Objective: Quality Management Systems

Scope: International

Process: Audit

Validity: 36 months

The ISO 9001 is an internationally recognized standard and part of the ISO 9000 standards series, that is issued by the International Organization for Standardization. It specifies requirements that organizations must meet in order to provide products and services that meet customer expectations as well as legal and regulatory requirements. It is applicable to all organizations, regardless of size, type and product/services, and is a fundamental requirement for cooperation with many other companies. The standard is based on the four fundamental pillars of orientation to the context of the organization, process orientation, continuous

improvement and risk management. Like the ISO/IEC 27001 the ISO 9001 is a standard and not a certificate, but the conformity with it can be certified by accredited organizations.

Another part of particular relevance to DataPorts is ISO/IEC 90003, which provides guidelines on the application of ISO 9001 to the acquisition, provision, development, operation and maintenance of computer software and related (supporting) services. Like the ISO/IEC 27701 this standard is not certifiable.

EuroPriSe Certificate (European Privacy Seal)

Organization: EuroPriSe GmbH, others

Objective: Data Protection and Privacy

Scope: EU

Process: Audit and document review

Validity: 24 months

The European Privacy Seal is a certificate valid in the EU. It is deployed by the Independent State Center for Data Protection Schleswig-Holstein (ULD) and sponsored by the European Union within the framework of the eTEN-program. Primarily the certification is carried out by EuroPriSe GmbH, which was founded especially for the certification, meanwhile there are different organisations that are accredited to issue the certificate. Objective is the certification of the data protection conformity of IT products and IT-based services aligned with the principles of European data protection law.

IDSA Participant & Core Component Certificate

Organization: International Data Spaces Association

Objective: Data Security, Infrastructure

Scope: EU, IDSA partners

Process: Self-assessment, Audit

Validity: limited

With International Data Spaces as a key infrastructure, IDSA occupies the position of a particularly relevant partner for DataPorts. For this collaboration with the IDSA and the partners in this network, different certificates are issued, two of which are particularly relevant for DataPorts. The participant certificate refers to an organizational / management level, while the core component certificate refers to a technological level.

The IDSA Participant Certification is a certificate that every IDS member needs to be able to work in infrastructure. The certificate is intended to demonstrate basic security requirements and effective implementation of a management system in the organization being certified. Three different security levels can be certified, the first of which can be achieved through a self-assessment and the next two through audits of the relevant systems. While the first level is sufficient to participate in the IDS, the third and highest level is necessary for the provision of important services. The third level would therefore be recommended for DataPorts. Synergies with other certificates can also be used for this certification, since properties that have already been certified are recognized here. This applies in particular to ISO/IEC 27001.

The IDSA Core Component Certificate is also required to operate in the IDS. The aim of this certificate is to be able to guarantee the functionality of the components used on the one hand and a corresponding security level on the other. In contrast to the Participant Certification, the focus here is on the technological level. Here, too, there are three successive security levels, the first of which is sufficient to operate in the IDS. Here, too, the third security level would be recommended for DataPorts, but at least the second security level. The criteria for certification are made up of IDS-specific requirements, best practice requirements and functional requirements from ISA/IEC 62443 (standard for industrial communications networks).

In this context, certification of DataPorts in conformity with ISA/IEC 62443 would become relevant for DataPorts. Certification of conformity with this standard alone does not have a high priority as things stand, but with the synergies with IDSA certification, a closer look could become more pertinent.

4.3.3 Roadmap to Certification

Building on the selection of certificates suitable for DataPorts, the first steps along the way are then necessary. The individual processes for certification and general requirements differ, but a roadmap can be given as to what needs to happen to get there (Figure 7). Important characteristics of the certifications are whether they fall more into a technological or organizational task area and whether they can only be implemented after the rollout or already in the projecting phase.

The selected certificates can be roughly classified as organizationally or technologically oriented, which is relevant to further procedures. Organizational requirements refer to the processes and management in the organization. Since DataPorts does not currently exist as a company, but rather as a project in a consortium, no requirements can yet be implemented or tested here, nor can certification be performed. However, it makes sense to analyze the requirements for the organization and to develop the company processes in line with these requirements even before a DataPorts spin-off company takes shape. However, certification of these processes can only take place after the spin-off. The certificates for ISO 90001 and ISO/IEC 27001 as well as IDSA Participant Certification fall into this category. Technology-related certificates refer - as the name suggests - to the technology behind the platform. In the case of DataPorts, this is therefore the software and infrastructure that constitute the data platform. These, too, can only be certified once a market-ready product is available. In contrast to the organizationally related certificates, however, an early orientation to the requirements of the certificates is necessary here to ensure successful certification. This means that direct orientation to the requirements described in the standards is necessary during the development of the platform, which requires the prompt allocation of responsibilities. This group includes the certificates for ISO/IEC 27001 (occurs in both groups), the EuroPriSe certificate and the IDSA Core Component certificate (including relevant components of ISA/IEC 62443).

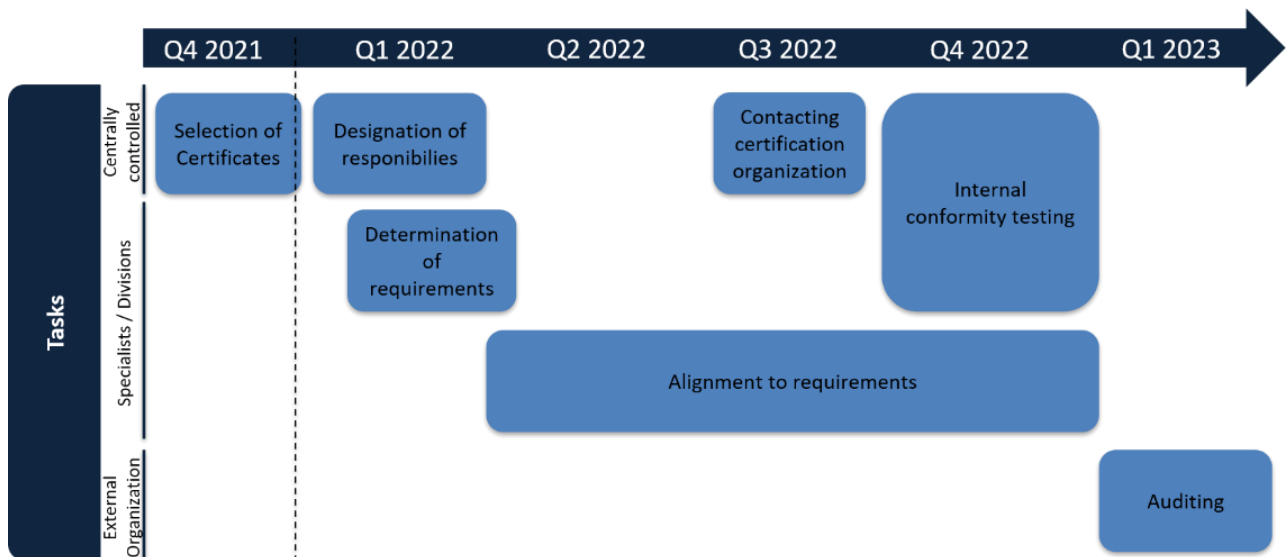


Figure 7: Roadmap to certification

5 UPDATE ON CLUSTERING ACTIVITIES

DataPorts is not working in isolation, but is part of different European innovation ecosystems, where the project will leverage connections to exploit collaborations and build community around data driven innovation, data sharing, data platforms and digitization of maritime ports and logistic value chains.

Facilitated by T6.3, the following three main kinds of activities are carried out, which are elaborated below:

- **Collaboration with related BDV PPP activities:** Collaborations are pursued with related projects and in the scope of relevant activities of the Big Data Value PPP.
- **Collaboration with linked activities:** In addition to the linked projects identified during the conception of the DataPorts project, collaborations cover related projects and other related activities from are not covered under the previous bullet.
- **Interaction with Advisory Board:** The DataPorts Advisory Board (AB) is one key instrument to strategically engage with decision makers and the wider stakeholder community.

5.1 COLLABORATION WITH RELATED BDV PPP ACTIVITIES

DataPorts is part of the implementation actions of the Big Data Value PPP, composed of the European Commission (EC) and the Big Data Value Association (BDVA) as public and private counterparts. BDVA is an industry-driven international not-for-profit organisation with over 200 members all over Europe, whose mission is to develop the Innovation Ecosystem that will enable the data and AI-driven digital transformation in Europe, delivering maximum economic and societal benefit, and achieving and sustaining Europe's leadership on Big Data Value creation and Artificial Intelligence (www.bdva.eu).

DataPorts collaborates with other projects included in the portfolio of the PPP (more than 60 projects, see https://www.big-data-value.eu/our_projects/). The collaboration and coordination of all projects is done through three different committees:

- **Technical Committee** includes technical managers.
- **Steering Committee** includes the coordinators of the projects.
- **Communications group**, which includes the leads of dissemination and communication.

DataPorts participates in all those committees, seeking to align strategies in the different fields, and to explore potential collaborations. Below we explicitly report on the activities in relation with the technical committee, as this is where DataPorts contributed with concrete technical presentations.

At the time of reporting, the following concrete activities have been carried out as part of the BDV PPP collaboration (Table 12):

Activity	Date	Main contact
EUHubs4Data Data Forum Presentation of technical challenges in DataPorts	30.03.2021	ITI
BDV PPP Technical Committee #8 (collocated with BDVA Activity Group Meeting #44) Presentation of metadata interoperability	22-23.04.2021	UPV

Activity	Date	Main contact
Data Spaces Synergy Group (KoM) DataPorts presentation and workshops participation	21.05.2021	ITI
Data Week 2021 Organised session	25-27.05.2021	UDE
DataPorts workshop at EBDVF 2021 Organised session	29.11-03.12.2021	ITI

Table 12: Collaboration activities with related BDV PPP activities

Below we briefly summarize these activities:

5.1.1 EUHubs4Data Data Forum

The EUHubs4Data is setting up a European federation of Big Data Digital Innovation Hubs (DIHs), with the ambition of becoming a reference instrument for data-driven cross-border experimentation and innovation, and support the growth of European SMEs and start-ups in a global Data Economy. Based on the concept “European catalogue, local offer”, EUHubs4Data will establish a Europe-wide, sustainable ecosystem drawing upon local expertise and achievements of European initiatives and national/regional Big Data DIHs.

EUH4D Data Forum is as an annual event to be held within the framework of the EUH4D project. It is created with the aim of raising awareness, sharing results and recommendations, and receiving contributions on strategies and policies from the European Commission around data.

The event was held on March 30, 2021 in online format with the participation of Santiago Cáceres (DataPorts project coordinator) who presented project technical challenges together with different experts in the field of European Big Data.

5.1.2 BDV PPP Technical Committee #8 (collocated with BDVA Activity Group Meeting #44)

As in previous occasions all BDVA members and the BDV PPP projects and other relevant initiatives joined forces around common topics of interest. In this case the focus was on the following topics (follow-up of AG42 and AG43):

- Data/AI Standards and interoperability
- Data Spaces
- Trustworthiness of Industrial AI

DataPorts contributed with one presentation in the session 3: Metadata Interoperability, Andreu Belsa from UPV explained the DataPorts approach for achieving data interoperability in ports, by using a common data schema model. The model is derived from best practices and well-known standards like FIWARE and UN/CEFACT data model.

5.1.3 Data Week 2021

Data Week 2021 (<https://www.bdva.eu/node/1735>) was held from 25th to 27th May (online). Data Week 2021 brought together the European Big Data and Data Driven AI research and innovation communities.

Following the Big Data Value Summit's footsteps, Data Week hosted exciting workshops and sessions to put the BDVA/DAIRO, Big Data Value PPP projects and the EUHubs4Data community at the centre of the event.

DataPorts organised a workshop focusing on data technologies/applications challenges and solutions in European Ports and Maritime sector in general, apart from DataPorts the workshop counted on representatives coming from SmartShip project (<https://www.smartship2020.eu>), PIXEL project (<https://pixel-ports.eu/>), the BDVA subgroup “mobility and logistics”, and BDVA task force “data sharing spaces”.

5.1.4 Data Spaces Synergy Group (KoM)

The Data Spaces Synergy Group (see [intro presentation](#)) is aimed at bringing together projects that already share a vision of what are the concrete baseline technologies and initiatives to rely on and integrate when addressing materialization of the mentioned taxonomy of Data Spaces Building Blocks.

The Data Spaces Synergy Group kick-off meeting was aimed at initiating the collaboration between organizations and projects sharing common views on how to materialize an open standard-based, open source available, and CEF-compatible soft infrastructure for creation of data spaces in Europe. Several projects part of the BDV PPP participated together with DataPorts in the Kick Off meeting: EUH4Data, i4Trust, BD4NRG, PLATOON, and Synergy.

Santiago Cáceres (DataPorts project coordinator) presented the project, and after that DataPorts participated in the three working groups with the following representatives:

- Task Force 1: Data Spaces Technology Building Blocks. Santiago Cáceres from ITI.
- Task Force 2: Business and Legal Frameworks + Policy recommendations. Cristina Muñoz from NTT Data.
- Task Force 3: Ecosystem building and Communications. Andreu Belsa from UPV.

5.1.5 DataPorts workshop at European Big Data Value Forum (EBDVF) 2021

Organised by the BDVA and the European Commission (DG CNECT), The European Big Data Value Forum (EBDVF) brings together industry professionals, business developers, researchers and policy-makers from all over Europe and other regions of the world to advance policy actions, and industrial and research activities in the areas of Data and AI.

A sponsored workshop of DataPorts at the Big Data Value Forum 2021 was given which took place from 29/11/2021 to 03/12/2021. The session lasted 1 hour, where a 10-minute presentation was given by Santiago Cáceres (ITI) project coordinator of DataPorts followed by demos of some components of the platform, in detail: Data Governance services by Alexandros Zerkelidis (CERTH), Data Semantic Interoperability component by Andreu Belsa (UPV), Data Abstraction and Virtualisation component by Achilleas Marinakis (ICCS) and the Data Analytics and AI services by Miguel Bravo (ITI).

The DataPorts slot was attended by around 60 persons online with good feedback received from audience and several questions raised.

5.2 COLLABORATION WITH LINKED ACTIVITIES

Collaborations are pursued carried out jointly with linked activities at the time of reporting are presented below (Table 13):

Linked project	Main contact
Ammitec (Association): “Association of Maritime Managers in Information Technology and Communications”	OTE

Linked project	Main contact
PIXEL: "Port IoT for Environmental Leverage"	UPV
Assist IoT: "Architecture for Scalable, Self-*, human-centric, Intelligent, Secure, and Tactile next generation IoT"	UPV
MobiDataLab "Labs for prototyping future mobility data sharing solutions in the cloud"	ITI

Table 13: Collaboration activities with linked projects

Below we briefly summarize these activities:

5.2.1 Ammitech

AMMITEC (<https://www.ammitec.org/>) is a non-profit scientific association, bringing together the ICT Managers of the global shipping companies and everybody else who is involved in maritime IT & Communications. It aims to promote the most efficient usage of modern Technology by "Promoting Seaworthy ICT", the relevant best practices in the global maritime sector and the empowerment of the ICT professionals.

OTE an industry partner of DataPorts, together with CERTH, a technology partner, co-organised a workshop in collaboration with Ammitec (<https://www.ammitec.org/>) that aspired to be the first step in a series of collaborative actions between DataPorts and Ammitec. It was emphasized on the technology transfer in the shipping and maritime ICT community predicting and planning the transformation of seaports.

The 3-hour digital workshop was held on May 13th 2021 and it was presented the vision of DataPorts towards the seaports transformation, along with the results of the 1st survey that was conducted in Q4, 2020. Several members of Ammitec have responded in that questionnaire. ICT managers, Data Consumers and Data Providers were among the workshop participants.

Moreover, in the technical session of the workshop, challenges in maritime and shipping were addressed, as well as blockchain-based solutions and use cases in the maritime sector, since it is a technology that can be applied in several fields and areas in shipping and maritime.

In addition, this workshop initiated discussions of Ammitec, with OTE and CERTH, related to blockchain potential benefits, the data usage from the DataPorts point of view as is the data governance, sharing and tracking. It is agreed to have a follow-up workshop when DataPorts will be reaching its end.

5.2.2 PIXEL

PIXEL (<https://pixel-ports.eu/>) (H2020-MG-2017) aimed to enable a two-way collaboration of ports, multimodal transport agents and cities for optimal use of internal and external resources, sustainable economic growth, and environmental impact mitigation, towards the Ports of the Future.

As both projects have several partners in common (like UPV, PRO and THPA), the feedback received from PIXEL Project have been constant in the previous months. The architecture and tools used in PIXEL have been analyzed. As a result, it was decided to use the same FIWARE components and Data Models guidelines used in PIXEL to implement the Data Access Layer components. There are some common points in the developments needed to integrate these FIWARE components with the rest of the components of the respective project platforms. Moreover, DataPorts is making use of a framework for data access agent development (pyngsi <https://pypi.org/project/pyngsi/>) provided by PIXEL to access the heterogeneous data sources.

Regarding the collaboration on communication and dissemination activities, DataPorts participated in a Pixel Webinar (https://pixel-ports.eu/?page_id=1692) in June as an external speaker in the session dedicated to "PIXEL architecture modules and platform installation". In this session, there was a slot dedicated to

explaining how the modularity of PIXEL is being leveraged by external EC-funded projects like DataPorts. Moreover, PIXEL participated in the workshop organized by DataPorts in the Data Week 2021, which was titled “Unleashing the potential of ports and maritime logistics via data-driven solutions: Opportunities and Challenges”. The workshop focused on how data-driven services and applications can help stakeholders in the logistics, ports, and maritime sectors to improve their operations, as well as the challenges that must be addressed to facilitate adoption of these solutions.

In addition, PIXEL and DataPorts presented a joint work in The 14th International Symposium on Intelligent Distributed Computing (IDC), where the use of DataPorts components in some scenarios developed in PIXEL was proposed from the point of view of architecture and design. This work will be published as part of the proceedings of the symposium. More details about this collaboration are provided in deliverable D6.6.

Finally, the PIXEL project ended this November, but efforts continue to seek synergies and participate in events and scientific publications between both projects.

5.2.3 ASSIST-IOT

ASSIST-IoT (<https://assist-iot.eu/>) is an EU H2020 ICT-56-2020 funded research project which aims at the design, implementation and validation of an open, decentralized reference architecture, associated enablers, services and tools, to assist human-centric applications in multiple verticals. One of the pilots consists of a port automation scenario. The ASSIST-IoT project began at the end of 2020. As both projects have several partners in common (like UPV, PRO and CERTH), the feedback received from ASSIST-IoT Project have been regular in the previous months.

Regarding the collaboration on communication and dissemination activities, ASSIST-IoT participated in the workshop organized by DataPorts in the Data Week 2021, which was titled “Unleashing the potential of ports and maritime logistics via data-driven solutions: Opportunities and Challenges”. The innovation manager of ASSIST-IoT presented the main synergies of the project with DataPorts.

Finally, the collaboration between DataPorts and ASSIST-IoT is still focused on possible collaborations and synergies between both projects in some common areas like AI, interoperability, IoT, Distributed Ledger Technology (DLT), Data Spaces or Data Sharing. Mainly, the projects are currently trying to collaborate on scientific publications and events.

5.2.4 MobiDataLab

MobiDataLab (<https://mobidatalab.eu/>) is the EU-funded lab for prototyping new mobility data sharing solutions. Its aim is to foster data sharing in the transport sector, providing mobility organising authorities with recommendations on how to improve the value of their data, contributing to the development of open tools in the cloud, and organising hackathons aiming to find innovative solutions to concrete mobility problems.

Santiago Cáceres, DataPorts project coordinator, participated in the first MobiDataLab Webinar titled “Fostering a data sharing culture for a better mobility in Europe”, inside a panel discussion about the importance of a data sharing culture in Europe, and their main challenges and opportunities.

An additional meeting was held between DataPorts and MobiDataLab during November 2021, it was decided to explore further collaborations, especially in the area of business models, and data and data platform exploitation paths. It is expected this collaboration will continue during 2022.

5.3 INTERACTION WITH ADVISORY BOARD

As reported in previous WP6 reports, the DataPorts Advisory Board (AB) is one key instrument to strategically engage with decision makers and the wider stakeholder community. The AB will foster an active engagement between AB members and key partners of the DataPorts consortium, thereby providing AB members with

early insights into project results and findings, whilst providing DataPorts members with external views and recommendations.

In particular, the role of the AB is to engage with DataPorts in the following ways:

- Challenge DataPorts work against new developments and advances in the state-of-the-art.
- Ensure that DataPorts stays in the highest level of scientific and technical quality, thereby ensuring expected impact.
- Provide scientific, technical and domain expertise on DataPorts results and methodology.
- Share common priorities and establish future cooperation opportunities of mutual benefit.

As opinion-leaders in their respective fields the members of the AB will provide a valuable referral point at critical milestones along the DataPorts project development.

The following individuals constitute the members of the AB:

- Lorenzo Cotino Hueso, Constitutional Law & Political Science Professor, University of Valencia
- Fernando Liesa, Secretary General, ALICE ETP
- Fotis Oikonomou, Senior Researcher, DANAOS Shipping
- Sue Probert, Chair of UN CEFAC
- Till Schlumberger, Strategy Consultant Digital Transformation, HPC Hamburg Port Consulting

The first AB meeting was chaired by Andreas Metzger (UDE). Key representatives of DataPorts partners (e.g., members of the general assembly or leaders of key work packages) joined it. It took place on April 22, 2021. The agenda was as follows (Table 14):

Item	Presenter/Moderator
Welcome and Round Table	Andreas Metzger, UDE (AB Chair)
High-level Overview and Achievements (goals, objectives, risks, ...)	Santiago Cáceres, ITI (Project Coordinator)
Technical Overview and Achievements (architecture, use cases, technical components, ...)	Paco Valverde, ITI (Technical Coordinator)
Break	
Impact (outreach, awareness, KPIs, ...)	Christos Gizelis, OTE (Impact Manager)
Dissemination (communication, social media, scientific publications, ...)	Carlos Palau, UPV (Dissemination Manager)
Innovation and Competitiveness (business opportunities, exploitation, ...)	Jan Jürjens, UKL (Innovation Manager)
Wrap up and final comments	Andreas Metzger, UDE

Table 14: Agenda for the Advisory Board meeting

The DataPorts members participating in the meeting were:

- Andreas Metzger, paluno/UDE; AB Chair
- Santiago Cáceres, ITI; Project Coordinator
- Paco Valverde, ITI; Technical Coordinator

- Christos Gizelis, OTE; Impact Manager
- Carlos Palau, UPV; Dissemination Manager
- Jan Jürjens, Fraunhofer & UKL; Innovation Manager

And the AB members:

- Lorenzo Cotino Hueso, University of Valencia; Professor for Constitutional Law & Political Science
- Fernando Liesa, ALICE ETP; Secretary General
- Sue Probert, UN/CEFACT; Chair
- Till Schlumberger, HPC Hamburg Port Consulting; Strategy Consultant Digital Transformation

The meeting was very productive, with helpful comments and constructive feedback. The main conclusions to come out of the meeting were the following:

- The possibility to use ALICE ecosystem to find candidates for project collaboration
- Links to ongoing work on semantics for big data exchange in the domain (UN/CEFACT) considered a transversal task of DataPorts Data Modelling
- Opportunities for Enhancing the Platform (Federation of Platforms)
- Pointers for how to get additional feedback on Innovation and Competitiveness, by e.g. survey with external customers, and analysis of existing roadmaps and business models (like BOOSTLOG or ENTRANCE)
- Impact Opportunities via ALICE Knowledge exchange platform

The outcomes were analysed, and action are being taken to strengthen the DataPorts activities.

6 CONCLUSION AND UPCOMING TASKS

This document constitutes deliverable D6.10 and summarizes tasks T6.3 and T6.4. It contains the initial activities to be performed in order to reach the goal of platform adoption and becoming the de-facto standard platform for seaports. These objectives required two different approaches to reach the ambitious goals. For this purpose, Task 6.3 defines several initiatives in which DataPorts is regularly represented. Task 6.4 deals with defined strategic directions for anchoring the DataPorts platform in the seaport sector.

Sections 3 and 4 provided input for the first two pillars of the scaling strategy. Section 3 identified the strategic initiatives that are highly relevant to DataPorts, for its further development process and beyond. These initiatives and possible interactions with DataPorts are described. Stronger focus is placed on the IDSA, as an emerging topic for data sharing. Section 4 established the foundations for trust in the platform. The basics of certifications were described, an overview of existing certificates was presented, and a selection on relevant certificates for DataPorts was included, based on the feedback of the consortium members.

In the section 6 three main activities to exploit collaborations and build community were presented. The collaboration with related BDV PPP activities were increased based on presentation, pitches, project meetings and publications. Further collaboration was enhanced with linked project as Pixel, PortForward or SmartShip. With the organization of the DataPorts Advisory Board meeting an external perspective provides additional recommendations for the development of the DataPorts platform.

Based on the scaling strategy, further measures will be implemented in the third year to create trust and awareness (see Figure 1). For this purpose, a customer relationship management concept will be developed to strengthen customer loyalty. The setup of a community will be continued in the context of the IDSA community to give a stronger insight into DataPorts. In addition, measures for easy integration of customers to the platform will be driven forward (Self-Assessment and DataPorts Ready Initiative). In addition, certain activities from the second year will be further developed during the third year. The various activities should lead to providing stakeholders with an easy entry into DataPorts, ensuring trust in the platform and binding stakeholders to the platform.

The milestones for the third year (M25-M36) are already defined by the roadmap. The concrete next steps to fulfil the roadmap are defined as follows:

- Develop the building blocks for the self-assessment
- Design a mock-up for integration into the website
- Create a CRM concept for DataPorts and conduct first activities
- Discuss with other strategic initiatives about a Maritime Data Space Community
- Set up a community
- Define the prerequisites and value proposition for DataPorts Ready Initiative
- Select and align with stakeholders regarding certificate
- Define responsibilities and determinate requirements
- Contact certification organization
- Continue collaboration with linked projects and activities

7 REFERENCES AND ACRONYMS

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7.2 ACRONYMS

Acronym List	
AB	Advisory Board
AISBL	Association internationale sans but lucratif
BDVA	Big Data Value Association
CRM	Customer Relationship Management
DIN	Deutsches Institut für Normung
DoA	Description of Action
EBDVF	European Big Data Value Forum
EC	European Commission
EU	European Union
FaaS	Functionality as a Service
FI-PPP	Future Internet Public-Private Partnership
GDPR	General Data Protection Regulation
HE	Horizon Europe
IaaS	Infrastructure as a Service
ICT	Information and Communications Technology
IDS	International Data Spaces
IDSA	International Data Spaces Association
IEC	International Electrotechnical Commission
Int.	International
ISO	International Organization for Standardization
MDS	Maritime Data Space
OPC	Open Platform Communications
PaaS	Platform as a Service
Prio	Priority
SaaS	Software as a Service
T	Task
ToC	Table of Contents
W3C	World Wide Web Consortium
WP	Working package

Table 15: Acronyms

7.3 APPENDIX

7.3.1 Appendix A: Survey of potential strategic initiatives

Initiative	Keywords	Location	What does the initiative offer?	Why is it interesting?	How does it connect do DataPorts?	Participation type
<u>Fiware Foundation</u>	non-profit open-source ecosystem	Germany	<p>Open sustainable ecosystem around public, royalty-free and implementation-driven software platform standards</p> <p>Easing the development of new Smart Applications in multiple sectors</p> <p>framework of open-source platform components to accelerate the development of Smart Solutions</p> <p>Standard APIs for data management and exchange</p> <p>Easy "plug & play" integration with other solutions and services</p>	<p>Open and global community</p> <p>Vendor-neutral approach for building and sharing portable and interoperable smart solutions</p> <p>Wide range of experimental infrastructures</p> <p>Global strategy</p> <p>Covers different domains: Farming, city, Energy and Industry</p>	<p>DataPorts as a vendor of a product</p> <p>Content creator for newsletters, blogs, etc.</p> <p>Expert for solutions in the maritime sector</p> <p>Collaborative working in hubs/creative spaces</p>	<p>Platinum 100.000 € p.a. (to take lead in the further development)</p> <p>Platinum strategic end user 100.000 € p.a. (users of ICT, but not ICT organisations as such)</p> <p>Gold 2.500 to 50.000 € p.a. (for an active role in pursuing the FIWARE mission)</p> <p>Gold strategic end user 1.250 to 25.000 € p.a. (users of ICT, but not ICT organisations as such)</p> <p>Gold Start-ups 1.000 € p.a. (companies that are less than four years old)</p> <p>Associate 1.000 € p.a. (ideal or non-profit legal entities, universities, technology centres, associations and similar organizations)</p>

Initiative	Keywords	Location	What does the initiative offer?	Why is it interesting?	How does it connect do DataPorts?	Participation type
<u>Open Industry 4.0 Alliance</u>	ecosystem marketplace communication platform	Swiss	<p>Framework and guiding principles for interoperability for all members</p> <p>Direct contact with the customer</p> <p>Initiative supports and promotes at time of market launch</p>	<p>Contact with potential customers</p> <p>Support with market entry and advertising</p> <p>Asset repository and network is API-enabled and can be integrated with customer back-end systems</p> <p>The vision of the alliance is global</p>	<p>DataPorts as a vendor of a product</p> <p>Content creator for newsletters, blogs, etc.</p> <p>Expert for solutions in the maritime sector</p> <p>Placement of the DataPorts Data Lab as a creative space for DataPorts to collaborate with other vendors or customers in a risk-free manner</p>	<p>Annual Revenue Tier (EUROS) -> Annual fee</p> <p>1B+ -> 25.000 €</p> <p>101M - 1B -> 10.000 €</p> <p>11M - 100M -> 5.000 €</p> <p><= 10M -> 2.500 €</p>
<u>EIT Digital</u>	Education Start-ups Creative and innovative work	Belgium	<p>Innovation and Education Ecosystem</p> <p>EIT Digital answers specific innovation needs by, for example, finding the right partners to bring technology to the market, supporting the scale-up of digital technology ventures, attracting talent and developing their digital knowledge and skills</p>	<p>Engaging with European partners in EIT Digital's Innovation Factory to create new products</p> <p>Future innovative collaboration</p> <p>Network for institutes and universities</p> <p>Network for investors</p>	<p>Collaborating and developing creatively and innovatively with each other</p> <p>Network that can be used to establish further contacts</p>	<p>Member of the Innovation Factory for creating digital products and find partners</p> <p>Member as an Accelerator to get support to raise investment, secure new business and find partners</p> <p>Member of ecosystem for entrepreneurial digital education for research and education</p> <p>Costs are unknown</p>

Initiative	Keywords	Location	What does the initiative offer?	Why is it interesting?	How does it connect do DataPorts?	Participation type
<u>Smart Maritime Network</u>	open data platform maritime and transport Blockchain	Ireland	Platform to promote the benefits of enhanced integration and data sharing among stakeholders within the maritime and transport logistics sectors Informing and educating the industry on technological developments and innovations Providing wider opportunities for relationship building and knowledge sharing Smart Maritime Council, a series of private meetings for maritime technology developers and systems integrators for discussions on the development of a wider range of mutually beneficial partnerships, on issues relating to compatibility, standardisation and harmonisation	Insight into new innovations and products Use of the network for further development of the platform Acquisition of new customers in the maritime sector	Placement as a provider Placement as a developer Content creator for newsletters, blogs, etc. Expert for solutions in the maritime sector Collaborative working in hubs/creative spaces Connection to the global market	on request

Initiative	Keywords	Location	What does the initiative offer?	Why is it interesting?	How does it connect do DataPorts?	Participation type
<u>Maritime Data Space</u>	ecosystem maritime sector marketplace	Norway	<p>Open maritime data exchange ecosystem for secure sharing of ship related data among trusted stakeholders</p> <p>Data analysis services while securing proper governance of the data</p> <p>Based on IDSA</p> <p>Transparent access to vessel related data from anywhere onboard or ashore, while securing proper governance of access by the data owners</p> <p>Automated, secure, robust, and efficient communication between ship and shore</p> <p>Building and commercializing services for their clients</p> <p>Enable platform-to-platform data exchange</p>	<p>Merger of both platforms</p> <p>Offering own services/products</p> <p>Lessons-learned for a maritime data platform</p> <p>Support and cooperation for market entry</p>	<p>Placement as a provider</p> <p>Placement as a developer</p> <p>Content creator for newsletters, blogs, etc.</p> <p>Expert for solutions in the maritime sector</p> <p>collaborative working in hubs/creative spaces</p>	On request

Initiative	Keywords	Location	What does the initiative offer?	Why is it interesting?	How does it connect do DataPorts?	Participation type
<u>Gaia-X AISBL</u>	Open-source ecosystem data infrastructure	Germany	<p>Open, transparent, and secure digital ecosystem, where data and services can be made available, collated and shared in an environment of trust</p> <p>Based on the principle of decentralisation</p> <p>The organisational structure of Gaia-X is built on three pillars: the Gaia-X Association, the national Gaia-X Hubs, and the Gaia-X Community</p> <p>Different domain working Groups within the Gaia-X Hib Germany: Agriculture, Energy, Finance, Geoinformation, Health, Industry 4.0/SME, Mobility, Public Sector, Smart City/Region, Smart Living</p>	<p>Gaia-X becomes leading standard of many platforms</p> <p>Network from many different industries with many potential customers</p> <p>Collaboration on new product/service development</p>	<p>Placement as a provider</p> <p>Placement as a developer</p> <p>Content creator for newsletters, blogs, etc.</p> <p>Expert for solutions in the maritime sector</p> <p>Collaborative working in hubs/creative spaces</p>	<p>Membership in the Gaia-X Association</p> <p>Participation in the German/other national Gaia-X Hub</p> <p>Involvement in the open-source Gaia-X Community</p> <p>Costs are unknown</p>
<u>IDSA</u>	not-for-profit Open-source infrastructure architecture	Germany	<p>Vision of data sovereignty and realizing the full value of data in secure, trusted, equal partnerships</p>	<p>Contributing knowledge and technology to high-impact projects</p> <p>Providing data-infrastructure services to</p>	<p>Placement as a provider</p> <p>Placement as a developer</p>	<p>Annual Sales [Mio. EUR] (group based) -> Annual Fee [EUR]</p> <p>> 10.000 -> 35.000</p> <p>2.500 to 10.000 -></p>

Initiative	Keywords	Location	What does the initiative offer?	Why is it interesting?	How does it connect do DataPorts?	Participation type
			<p>IDS grounded in European values of trust and the self-determination of data usage by data providers</p> <p>A standard based on European values</p> <p>IDSA's coalition, consisting of some of the most respected and innovative companies and research organizations in Europe, enables to develop a broad, open standard for data marketplaces and data platforms</p>	<p>the nine European data spaces</p> <p>Providing advice, knowledge and expertise to the European Data Act</p> <p>Establishing a network of hubs across Europe and beyond</p>	<p>Content creator for newsletters, blogs, etc.</p> <p>Expert for solutions in the maritime sector</p> <p>collaborative working in hubs/creative spaces</p>	<p>25.000</p> <p>500 to 2.500 -> 15.000</p> <p>50 to 500 -> 7.500</p> <p><50 -> 2.500</p> <p>Universities, NGOs, etc. - > 1.000</p> <p>Start-ups (younger than four years) -> 1.000</p>
<p><u>Silicon Economy (IML)</u></p>	<p>ecosystem for platforms</p> <p>Logistics</p> <p>Open-source</p>	Germany	<p>Strengthening the logistics industry in Germany and Europe</p> <p>Creation of new business potential</p> <p>Supporting companies with sustainability goals</p> <p>Supporting companies in building a platform today still involves enormous costs</p>	<p>Summary of various supply chain information</p> <p>Individual supply chains become networked and self-orchestrated ecosystems</p> <p>Real-time and simultaneous access to information</p> <p>Synchronized demand and supply planning</p>	<p>Placement as a provider</p> <p>Placement as a developer</p> <p>Content creator for newsletters, blogs, etc.</p> <p>Expert for solutions in the maritime sector</p> <p>Collaborative working in hubs/creative spaces</p>	on request

Initiative	Keywords	Location	What does the initiative offer?	Why is it interesting?	How does it connect do DataPorts?	Participation type
			<p>Creation of software and hardware environment for autonomous logistics controlled by artificial intelligence</p> <p>Operating system will meet the highest data protection requirements and can be used by any company, regardless of size</p> <p>To avoid isolated applications and dependencies</p>	<p>Stronger customer focus through use of multiple channels</p> <p>DataPorts gains pooled insight into supply chains</p> <p>DataPorts can provide information itself</p>		
<u>Blockchain europe</u>	Blockchain Open-source platform	Germany	<p>It is a project to establish the European Blockchain Institute in Germany</p> <p>It will be created to drive digitalization in science and practice</p> <p>Provision of initial information through to joint implementation</p> <p>For people interested in blockchain who want to learn more about the technology and its possibilities (Starters),</p>	<p>DataPorts also uses blockchain technology</p> <p>Network for those interested in and using blockchain</p> <p>Europe-wide network operated by science</p>	<p>Provider of a platform and services</p> <p>Expert for blockchain interested parties from the maritime sector</p> <p>Content creator for newsletters, blogs, etc.</p> <p>Expert for solutions in the maritime sector</p> <p>collaborative working in hubs/creative spaces</p>	on request

Initiative	Keywords	Location	What does the initiative offer?	Why is it interesting?	How does it connect do DataPorts?	Participation type
			community partners who have already made their first experiences with blockchain and its added value (Advanced) or experts who are deep in the topic (Experts)			

7.3.2 Appendix B: Template Survey Certification

No.	Question	Relevance					Comment
		1	2	3	4	5	
1	How important is the certification of DataPorts for generating trust with customers in general?						
2	Per definition compliance is not a part of certification, but there are huge intersections. How important do you rate the issue of compliance for DataPorts?						
3	Various Certifications have a different geographical scope. How important are the following regions for the success of a certification of DataPorts:						
	- EU						
	- USA						
	- Asia						

4	- International						
	How important is the certification in the following areas for generating trust:						
	- Cloud Systems						
	- Software as a Service						
	- Platform as a Service						
	- Functionality as a Service						
	- Data Security						
	- Privacy						
	- Compliance						
	- Management Systems						
...							
5	Certificates can be issued according to various (international) standards (e.g. ISO, IEC) or individual requirements of accredited certification organizations (usually private companies). How important is a certification according to these two domains?						
	- According to standards						
	- According to certification organizations						

6	Depending on the intended certificate and (sometimes) the certification level there are in general two different types of certification processes. On the one hand, you can get your certification by self-assessment, which usually produces a weaker certificate. On the other hand, you can get your certification by an external organization that conducts an audit in the target organization, which is usually more costly but generates a stronger certificate. How high do you assess the impact of each?					
	- Certification through self-assessment					
	- Certification through audit					

7.3.3 Appendix C: Result Survey Certification

No.	Question	Score	Relevance				
			1	2	3	4	5
1	How important is the certification of DataPorts for generating trust with customers in general?	3,8			3	4	1
2	Per definition compliance is not a part of certification, but there are huge intersections. How important do you rate the issue of compliance for DataPorts?	4,1				7	1
3	Various Certifications have a different geographical scope. How important are the following regions for the success of a certification of DataPorts:						
	- EU	5,0					8
	- USA	2,6	1	2	4	1	

No.	Question	Score	Relevance				
			1	2	3	4	5
	- Asia	2,6	1	3	3		1
	- International	3,8			3	4	1
4	How important is the certification in the following areas for generating trust:						
	- Cloud Systems	3,8			3	4	1
	- Software as a Service	3,4		3		4	1
	- Platform as a Service	3,8		1	2	3	2
	- Functionality as a Service	3,5		2	1	4	1
	- Data Security	4,8				2	6
	- Privacy	4,5				4	4
	- Compliance	3,6			3	5	
	- Management Systems	3,9	1		1	3	3
	...						
5	Certificates can be issued according to various (international) standards (e.g. ISO, IEC) or individual requirements of accredited certification organizations (usually private companies). How important is a certification according to these two domains?						

No.	Question	Score	Relevance				
			1	2	3	4	5
	- According to standards	4,0			2	4	2
	- According to certification organisations	3,5		1	4	1	2
6	Depending on the intended certificate and (sometimes) the certification level there are in general two different types of certification processes. On the one hand, you can get your certification by self-assessment, which usually produces a weaker certificate. On the other hand, you can get your certification by an external organization that conducts an audit in the target organization, which is usually more costly but generates a stronger certificate. How high do you assess the impact of each?						
	- Certification through self-assessment	2,8	1	1	5	1	
	- Certification through audit	4,5				4	4

No.	Comment
1	In general, a consumer/customer trusts more easily a product that is certified. However, many ICT components are preferred, based only on the producer's brand name.
2	Although compliance is not a part of certification, there is a number of National or International legislation/regulations (i.e. GDPR) that DataPorts must comply with.
3	Stronger markets in my perspective. Depends on the market that DataPorts wants to infiltrate. Different parts of the world have different

	<p>certifications; DataPorts was developed and will be adopted (at least at first) by EU countries. However, considering that DataPorts is a universal solution, it would make sense to have an International certification.</p>
4	
5	<p>However if a major port or a cluster of ports adopts DataPorts Platform, the rest will follow.</p>
6	<p>Self-assessment is usually the process prior to the audit.</p>