

# Study on technological and economic analysis of industry agreements in current and future digital value chains



## Introduction to the Final webinar & DRAFT Executive Summary

### Technological and economic analysis of industry agreements in current and future digital value chains

A study prepared for the European Commission  
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40 Jahre



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By the European Commission, Directorate-General of Communications Networks, Content & Technology.

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## Purpose of this document

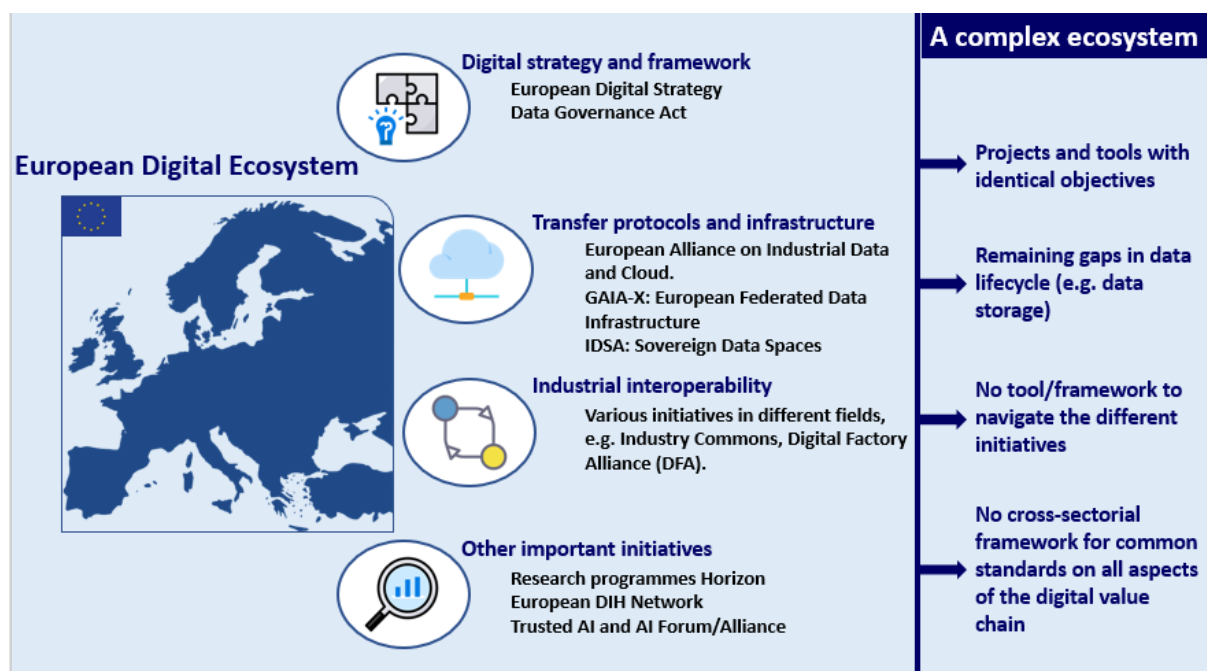
This document was developed in preparation to the final webinar to be conducted in the context of the European Commission’s (DG CNECT) study on Technological and economic analysis of industry agreements in current and future digital value chains.

The aim of the study on Technological and economic analysis of industry agreements in current and future digital value chains is to advance research in this field by addressing the following objectives:

1. **Identify 7-10 innovation areas** where industry agreements (IAs) have high potential to create markets and market opportunities;
2. **Validate the need and viability** of such agreements for 3-5 innovation areas;
3. **Provide recommendations** to be taken up by the industry, the European Commission and/or Member States to facilitate and increase the development of industry agreements to enhance interoperability and data sharing.

This webinar is organised close to the finalisation of the project and is targeted towards relevant industry stakeholders as well as EU policy makers. It aims to disseminate the key findings from the study to a broader audience. DG CNECT encourages the participation of actors already engaged in the data space ecosystem and of those who are interested in learning about its opportunities and how industry agreements can have a role in its development. In this sense, the webinar will also gather inputs, particularly from industry, on the way the study outcomes can be used to further stimulate an already vibrant activity in terms of creation and development of European data spaces. Some of the many different elements of the European Digital Ecosystem are summarised in the figure below, illustrating the framework in which the study outcomes will be used.

Summary and overview: the European Digital Ecosystem



Source: CARSA, 2021. This figure was created using resources from Flaticon.com.

The final study report is currently under review by the European Commission. The following DRAFT Executive Summary gives an indication of the content of the report, which will be presented in the webinar. The agenda of the webinar is presented on the registration website: <https://carsa.es/final-webinar/?lang=en>.

## DRAFT Executive summary

Connectivity, digitalisation and the Internet of Things are radically transforming economies and business activities. New devices and connected systems are leading to an exponential growth in data generated, helping to create a thriving data economy, which in the EU27 is expected to grow in value from €301 billion in 2018 to €829 billion by 2025.

Aware of the importance of the data economy, policy-makers in several countries and regions are taking measures to help their own countries and organisations to get ahead of the race. The European Commission has launched a series of documents, declarations and initiatives. One example is the recently released European Data Strategy, which aims to make the EU a leader in a data-driven society.

This study was commissioned by the European Commission to support the development of a common industrial data space and the digitalisation of European industries. The overall objective is to provide recommendations and guidance to help industry and policy-makers to further advance industrial digital ecosystems. Thriving digital ecosystems require the development and application of shared standards by a critical mass of industry players to ensure they become the norm. To achieve this goal, **“industry agreements” (IAs) are needed to establish a common understanding of functionalities, architectures and specifications.**

Achieving this goal will ensure that every business in Europe, whatever the sector, can reap the benefits associated with digital innovation. To create new markets and market opportunities, European industries need to agree on the functions and interfaces for the platforms, reference architectures and interaction protocols that will support the growth of ecosystems and further adoption of standards.

The **approach of the study** was to: 1) Identify 7-10 innovation areas in which industry agreements have a high potential to create new markets and market opportunities, validate the need for and viability of industry agreements in 3-5 areas, and recommend further actions; 2) Investigate the impact of existing industry agreements in current and future value chains; 3) Provide recommendations for take-up by industry, the European Commission and/or Member States.

The study first identified **eight sectors** (manufacturing, mechanical engineering, aerospace, chemicals, transport and logistics, agriculture, health and energy) in which the implementation of industry agreements could have a high economic impact. An in-depth analysis has identified **three clustered areas of innovation that could generate interesting opportunities and have a high economic impact:**

1. Data sharing/exchange;
2. Plug & Play/interoperability;
3. Advanced data analytics and Artificial Intelligence.

The three areas cover aspects such as interchangeability, interoperability and processability, all of which are considered to be essential characteristics of a data space and a robust and data-driven European economy. Each of the three innovation areas provides opportunities for the target sectors, their stakeholders and the European economy to achieve significant economic gains. **It is therefore necessary to define a series of actions to support and encourage the development of these three areas, to drive the transition to digital leadership and strengthen the global competitiveness of European industry.**

The emergence of new technologies, connected devices and smart devices has exponentially increased the quantity of data available to industries. As a consequence, new data ecosystems have emerged across a wide range of industries, from mechanical engineering to manufacturing and healthcare. By fully leveraging data from numerous suppliers, organisations will have the opportunity to generate a range of new economic and technological incentives that will enable them to make the most of the data economy and grow their businesses. To fully benefit from these new and emerging data ecosystems (perceived as infrastructure, analytics, tools, hardware and programmes), and enable the redefinition of individual industrial processes and the entire digital value chain, implementation of actions in all three innovation areas are essential.

However, **the importance of each area and the degree to which they should be prioritised can vary from one sector to another.** In mechanical engineering, for example, the priority is to develop interoperable machine tools

to increase operational efficiency, reduce integration costs and generate new business opportunities. In the chemical industry, however, the development of exchangeable formats for chemical molecule and reaction is the mandatory prerequisite for the modernisation of the industry.

The study also provides:

- (i) an analysis of the **barriers** that prevent the development and implementation of an industry agreement together with possible pathways for their removal;
- (ii) tangible evidence of **opportunities**, demonstrating how sectoral agreements can help make European industries more competitive;
- (iii) **high-level specifications – “industry agreement templates”** – including technical and legal clauses; and
- (iv) a number of **recommendations on how to remove barriers and unlock opportunities** to develop sectoral agreements that can produce a high economic impact.

The **entry barriers** to establishing a robust and successful data ecosystem are typically high. They encompass a wide variety of challenges from technical to legal and economic. **Technical challenges** include fundamentals such as assessing data quality and accuracy, achieving semantic and technical interoperability, and ensuring that ecosystem participants have access to data. Creating a data ecosystem also means building a reliable and collaborative network of many diverse actors that are willing to work together and are committed to achieving similar or shared objectives. To facilitate this work, processes, architectures and IT languages require harmonisation. **Legal barriers** related to intellectual property rights, data ownership and data sovereignty are other issues that need to be addressed. The latter are generally seen as constraints that can slow down or prevent the adoption of industry agreements. This is the case, for instance, with issues such as competition and liability law. Competition issues can arise where there are problems accessing data (in particular, the failure to provide access) or in relation to evolving standards, whereas liability for damage due to inaccurate data is a recurring issue in all sectors.

From an **economic point of view**, the study identifies a range of barriers that inhibit the development of industry agreements. The structure of an industry or its value chain segments can influence the potential for IA development and implementation. This is most evident where an industry structure is characterised by a prevalence of SMEs (e.g., mechanical engineering, agriculture). Significant barriers are also represented by the **complexity of the technical aspects** addressed by an IA and by the **complexity of the regulatory environment** in which an IA operates, especially when regulations are not harmonised across borders. A multiplicity of rules at different levels can also create considerable uncertainty. The nature of competition and the fear of losing competitive advantage when disclosing business information are also important factors and potential barriers. They can be further complicated by a lack of trust among stakeholders on key aspects, such as how data will be (re)used, the integrity of the systems underpinning IA implementation, or on the definition of the roles, processes, business ethics and general principles that apply to data sharing agreements.

**Barriers can be assessed from two different perspectives: those that limit the adoption of new technologies and solutions; and those that limit the adoption of industry agreements.** The first type includes, for example, issues related to the lack of interoperability, which can dissuade small operators from investing in new tools. Industry agreements are typically designed to remove these types of barriers. The second type includes, for example, concerns about data sovereignty and data ownership, which are some of the most powerful deterrents to the adoption of industry agreements. This study provides suggestions on how to remove these types of barriers.

This study also evaluates a range of opportunities in the data economy to develop high-impact IAs. **In each of the three clustered areas, the most significant opportunity has been identified:**

1. Development of a data asset value exchange mechanism;
2. Development of an interoperability framework by mapping standards and closing the gaps;
3. Increase of data quality for advanced analytics and artificial intelligence.

For each of these general opportunities, sector-specific opportunities were assessed and guidelines provided as strategic tools and frameworks. They are designed to enable and facilitate the development of industry agreements to deliver key economic benefits and unlock industry opportunities in each of the three innovation areas. Some examples are provided to demonstrate the point. The development of mandatory maintenance

reporting standards is expected to foster the development of intelligent maintenance. The development of chemical formulas / reaction standards to facilitate data exchange in the chemical industry is expected to trigger the development of new business opportunities for the industry. Establishing a network of Data Clearing Houses would provide a valuable intermediary service to enable secure data sharing and exchange between partners.

**High-level specifications have been developed for three "industry agreement templates" from a legal and technical point of view.** The templates have been designed to provide a complete and flexible framework that can be adapted to fit the needs of individual sectors. Each template features a series of legal and technical clauses that can be discussed and agreed upon during the IA definition process.

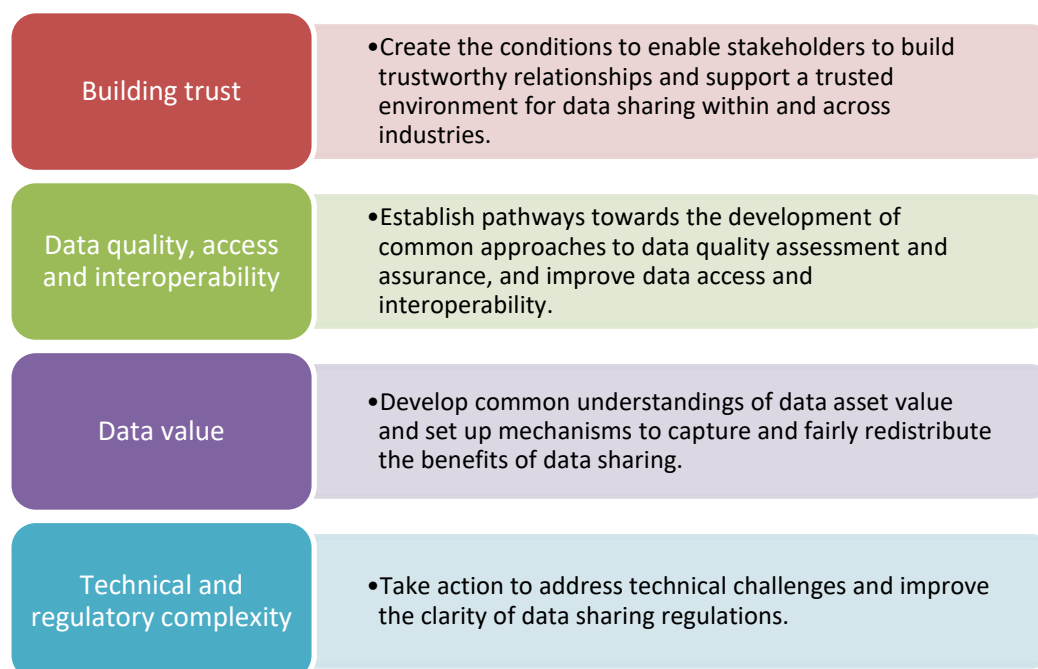
For example, the "IA on common Ontology-driven Data Documentation: Shared Taxonomies and Models" provides a list of all of the requirements necessary for the development of an interoperable digital ecosystem. Another example is the "IA on Shared Data Spaces", which focuses on aspects connected with the technical, operational and functional requirements for data space governance.

The framework covers:

- Data Quality and Data Value Exchange (smart grid and manufacturing applications);
- Common Ontology-driven Data Documentation (applications in lab robotics and the development of software translation tools);
- Shared Data (testing field for common chemical formula and reaction representation).

**Taken together, these three agreements address the 9 building blocks necessary for the development of a common industrial data space: data standards; business models; governance; legal agreements; exchange protocols; identification and authentication; authorisation; metadata; and operational agreements.** This set of IAs can therefore be used by policy-makers and industry as a strategic roadmap for the digitalisation of industrial processes.

Finally, the study presents **four key cross-cutting recommendations** to help stimulate greater cooperation in the IA development and implementation process and promote the development of common industrial data spaces:



For each of these recommendations, specific policy and industry actions are proposed, including an assessment of their potential impacts on industrial competitiveness.