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



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1. Welcome & introduction

Matthias Kuom, DG CNECT

Pär Weström, CARSA

Agenda	Time	Title	Speaker
	10:00 - 10:05	Welcome	Matthias Kuom (DG CNECT)
	10:05 – 10:15	Introduction to the study	Pär Weström (CARSA)
	10:15 – 10:50	Barriers and opportunities for new Industry Agreements Best practice examples	Luca Turturro (Ecorys) Bert Peeters (KU Leuven) Ieva Savickaite (CARSA) Haifa Rifai (VDI/VDE-IT)
	10:50 – 11:10	Building blocks for the development of Industry Agreements Draft IA templates	Audren Layeux (CARSA) Bert Peeters (KU Leuven)
	11:10 - 11:30	Recommendations for industry and policy makers	Luca Turturro (Ecorys)
	11:30 – 11:50	Industry Agreements, Data Ecosystems and Value Chains: Moving Ahead	Pär Weström (CARSA) Industry representatives
	11:50 – 12:00	Closing and outlook	Yves Paindaveine (DG CNECT)







Introduction to the study

Study objectives

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



Overall study methodology



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2. Barriers and opportunities for new Industry Agreements | Best practice examples

Luca Turturro, Ecorys Bert Peeters, KU Leuven Ieva Savickaite, CARSA Haifa Rifai, VDI/VDE-IT

Key economic barriers

Industry structure / prevalence of SMEs	Lack of a 'coordinator' Lack of financial resources Lack of knowledge
Costs of IA development	Technical complexity Regulatory complexity Coordination/structural complexity (number of partners)
Nature of competition and competitive advantage	Competitive advantage Technology lock-in
High costs of IA implementation	Investment costs (capital, processes, knowledge) Switching costs
Non-transparency and asymmetry of IA costs and benefits	Non-transparency of costs and benefits Non-transparency of the value of outputs Misalignment of the distribution of costs and benefits
Data/system integrity and ownership	Security of commercially sensitive and personal data Traceability Protection of intellectual property

Key legal barriers

	Absence of clear & overarching legal framework
Data ownership	'Data ownership' primarily regulated on a contractual level
	Issues of fair distribution of benefits & protection of data provider interests
	Need for new collaborations and approaches to increase trust and data access
Data access and	Issues of data quality
quanty	Unclear liability regime for erroneous data
	Mixed datasets
Protected/sensitive	Inference of protected or sensitive information & dynamic nature of data
uala	Stakeholders rely heavily on guidance by DPAs and other authorities
	Data access and anti-competitive behavior
Competition	(Potential) anti-competitive effects of industry agreements, including standards
	development
	Challenging application of liability regimes to Al
Liability	Allocation of control and liability/responsibility in a contractual context
	Cross-border context of AI supply chain
	Need for more specific and detailed guidelines
Ethical aspects of Al	

OPPORTUNITIES

Opportunities for IAs

$\widehat{\boldsymbol{r}}$ Three connected areas for a common data space





OPPORTUNITIES

FUTURE DATA SPACE AND DATA SHARING/EXCHANGE

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Data sharing/exchange: developing Data Asset Value Exchange Mechanism

Two opportunity areas have been identified to serve as both an area for experimentation (policy sandboxing) and as a building block for the development of the data market:



To be exchanged, data must be turned into an asset that is exchangeable through mechanisms that go beyond simple B2B marketplaces.

Future data space

Three layers of a future data space

To exchange sensitive information, industry players require a series of guarantees to help:

- develop trust,
- protect data sovereignty/ownership,
- ensure technical feasibility and;
- maintain a level playing field for all in future data spaces.





The complexity of exchange information excludes the possibility of only one single data exchange mechanism/data space.

European Clearing House example



A Data Clearing House would work as an intermediary to enable data exchange between partners while providing protection against counterpart risks (e.g., fear of data sovereignty loss).





Setting-up a European Clearing house for dataexchange

- Developing National Clearing Houses
- Development of European Umbrella Organisation responsibilities (proposed to be given to the ''European Data Innovation Board'')

Developing a federated European infrastructure for data sharing



Support the development of Gaia-X and the European Alliance for Industrial Data and Clouds to define a common European approach on federating cloud capacities.

Define clear and fair rules on access and the re-use of data at European level.

Invest in next generation standards, tools and infrastructure to process and store data.

Join forces to develop European cloud capacity and pool European data in different sectors (EU-wide common and interoperable data space).

Provide rights, tools and skills to enable users to fully control their data.

OPPORTUNITIES

INTEROPERABILITY AND PLUG & PLAY

Interoperability framework for autonomous Plug & Play systems



Taxonomy-driving mapping initiative

Four opportunities have been identified to support this type of approach for the integration of existing standard formats and to address gaps in standards:









Development of Plug & Play machine tools

Development of a for a framework architecture laboratory robotics



Integration on digital health record system

Impact of P&P machine tools on mechanical engineering



OPPORTUNITIES

DATA QUALITY FOR ADVANCED ANALYTICS AND ARTIFICIAL INTELLIGENCE

Increase data quality for advanced data analytics and AI

Opportunities



Attractive for the development of data quality models



The development of data quality in these two sectors is expected to enable the development of advanced analytics and AI with great market impact.

Data quantity and quality is critical for the digital transformation and the competitiveness of modern organisations.

1. Informed and better decision-making and improved risk mitigation.

- 2. Easier and more accurate audience targeting.
- 3. Increase profitability through improved operational efficiency and sales strategy.

4. Improve customer satisfaction through customisation of products and services.

Impact of data quality to modernise the smart grid





Best practice iSHARE





Goal: Efficient co-working process in the logistic sector



Description: Standardised framework of agreements with essential functional, technical, legal and operational standards that are needed for collaboration and data exchange



Features:

- allows data sharing even with new and yet unknown partners
- enables companies to participate easily because no additional software/platform must be installed. Adaption of internal communication systems is sufficient
- allows participants to keep control over their data at all time (data sovereignty)
- initial agreements signed between partners simplified coordination mechanisms



Partners: large number of "implementation partners" (e.g. globis, expertum, ecs international,...)

Best practice Catena-X





Goal: secure data exchange between all participants involved in the automotive value chain

Description: Rapidly scalable and expandable ecosystem, which allows all contributors in the automotive value chain to participateStandardised framework of agreements with essential functional, technical, legal and operational standards that are needed for collaboration and data exchange



Features:

- consistent data chains for relevant value creation processes
- end-to-end data chains
- application areas are quality management, logistics, maintenance, supply chain management and sustainability
- supply chain transparency to enhance accountability among all stakeholders



Main partners: BMW, Mercedes Benz, Volkswagen, Trumpf, Bosch, BASF, Siemens, SAP

Best practice GAIA-X





Goal: Creating a secure, federated data infrastructure that meets the highest standards of digital sovereignty while promoting innovation.

GAIA-X connects centralised and decentralised infrastructures in order to turn them into a homogeneous, userfriendly system.



Features:

- develop common requirements for a European data infrastructure
- develop foundations for a federated, open data infrastructure based on European values



Partners: More than 500 organisations with a large geographic coverage

Best practice openDEI





Goal: support the implementation of next generation digital platforms in manufacturing, agriculture, energy and healthcare

Project to detect gaps, encourage synergies, support regional and national cooperation, and enhance communication among the Innovation Actions implementing the EU Digital Transformation strategy with focus on:

- Platform building
- Large scale piloting
- Data ecosystem building
- Standardisation



Features: Knowledge transfer, support



Partners: EHTEL, IDSA, Atos, IDC, FIWARE, Tecnoalimenti, Innovalia Association, Engineering, Fondazione Politecnico di Milano

Best practice DAWEX





Goal: Cross-sectoral data exchange and data marketplace

Manage data traffic by sourcing, monetising and exchanging data directly with each other, completely securely and in compliance with applicable regulations



Features:

- Individual solutions with flexible operating models from private data exchange to a global data marketplace including multiple use cases (e.g. data sharing, data sourcing, monetising)
- Regulatory and contractual compliance thanks to direct licensing between provider and acquirer and local data protection regulations support and privacy-by-design.
- Acting as a trusted third-party and offering a platform with carefully vetted participants



Partners: More than 8000 "implementation partners" worldwide

Best practice Legal Testbed





Goal: provision of legal support to lower the barriers for the development and use of IoT-Technologies (especially automated business processes)

Project aims to develop a public accessible digital legal testbed for autonomous and automated business processes, e.g., among AI trained software agents.



Features:

- tools to assess legal compliance of automated contracts
- concept and implementation support to enable SMEs to create and use (automated) hybrid services
- creation and testing of a new cooperation model for dynamic IoT value chains
- Provision of recommendations for action on new legal standards for policy makers and companies



Partners: Fraunhofer Institute, University of Saarland (institute for law), Horst Goertz Institute for IT security



3. Building blocks for the development of Industry Agreements | Draft IA templates

Audren Layeux, CARSA Bert Peeters, KU Leuven

Removing the barriers, coordinating efforts and seizing opportunities: template IAs

Three connected areas for a common dataspace





• Each IA thought as an independent tool tailored to its specific area

• Coherent framework tackling all elements simultaneously

• Comprehensive lists of all the key elements that must be addressed to develop an industrial data space

The 9 building block for a common industrial dataspace





9 building blocks for an industrial Data Space

Technical specifications	Legal and organisational	Data Specifications
Data standards Exchange protocol Identification & authentication Authorization	Business model Governance Legal agreements Operational Agreement	Metadata

Constructing the industrial Data Space: template IAs

Data Quality and Data Value Exchange	Ontology-driven data Documentation	Shared industrial Data Space
	🗳 Data Standards	Exchange protocols
🇳 Data Standards	🗳 Metadata	Identification & Authentication
🗳 Business Model	🇳 Governance	Authorisation
Legal Agreements	🗳 Legal Agreement	🌍 Governance
	Perational Agreements	Legal Agreements

Industry Agreements on shared data spaces



	Technical Clause					
S	Exchange protocol	Identification & Authentication	Authorisation	Governance		
	TC 1 Functional agreements (Definition of roles, essential services, certification bodies for participation in the ecosystem) TC 3 Technical agreements (Common Reference Architecture for data space, interoperability assessment & criteria) TC 6 Technical features for secure data portability.	TC 2 Authentication agreements (Common practices and tools for identification and authentication of entities involved in the initiative)	TC 4 Operational agreements (DVC Data Space governance model, shared operational processes including criteria for admission, certification, withdrawal, warnings, suspension, exclusion, incident management, change management, Service Level Agreements and Policies, release management, maintenance	TC 5 Technical protectionof data sovereigntyagreement(Practices and tools thatentitle party uses forauthorising other partyaccess to proprietarydata)TC 7 Tracking ofownership rights.(Practices and tools thatenable to track ownershiprights of data assets atevery step of the datavalue chain, includingonce data are aggregatedand ovchanged		

Industry Agreements on shared data spaces



Legal				
Legal pare	nt clauses	Additional types of clauses	Points of attention	
Data related clauses:SC 1 Data availability andqualitySC 2 Data ProtectionSC 3 Data accessSC 4 Re-use of dataSC 5 Security measures andtechnical means for dataexchangeIP-related clauses:SC 6 Access to backgroundIPSC 7 Access to foregroundIP	Other core contractual clauses: SC 10 Liability SC 11 Parties' rights SC 13 (Alternative) dispute resolution	A certification system (or similar system) should be set up in order to guarantee the identity and trustworthiness of the data providers and users The platform may also require an embedded payment system	<pre>(Im)balance of power and potential competition and B2B unfair commercial practice law issues Governance structure to take into account the dynamic nature of data Overall consistency of contractual relationships within the ecosystem</pre>	

Industry Agreements on Common Ontology-driven Data Documentation: Shared Taxonomies and Models II



Technical Clause				
Data Standards	Operational Agreements	Metadata	Governance	
TC 1 Mapping the ontologies initially adopted by the DVC TC 2 Procedure for classification and selection of ontologies and vocabularies relevant to the DVC	 TC3 Means agreed to access the shared ontologies and vocabularies relevant to the DVC *TC4 Procedure to update/change ontologies and models *TC6 Procedure to trigger the development or elimination of new ontology TC 5 Procedures to assess performance of adopted standards. 	 *TC4 Procedure to update/change ontologies and models *TC 6 Procedure to trigger the development or elimination of new ontology 	 TC 8 Vocabulary and taxonomy governance model TC 7 Procedures to certify DVC taxonomy conformity 	

Industry Agreements on Common Ontology-driven Data Documentation: Shared Taxonomies and Models II



	Legal				
<u>~</u>	Legal pare	nt clauses	Additional types of clauses	Points of attention	
IP-related (SC 6 Access IP SC 7 Access IP	clauses: s to background s to foreground	Other core contractual clauses: SC 10 Liability SC 11 Parties' rights SC 13 (Alternative) dispute resolution	Provisions to define conditions for third parties to be granted access, as well as to determine their rights and obligationsOptional: Rules for adhering to one standard or anotherContractual regulation of compatibility strategy (e.g. retro compatibility with existing standards)	Limitation of contractual agreements (e.g. mandatory compliance with regulatory frameworks, statutory law required to set up relevant standards) Potential competition law issues	



Technical Clause				
Business Model (Data Asset Value Exchange Mechanism)	Metadata	Data Standards	Governance	
TC 1 Data Asset nature and features to contribute to the DVC(Data assets of interest to the DVC)TC 2 Data Quality (DQ) framework(Mechanisms to characterise the obligations related to ensure the "quality" of datasets)TC 3 Standards & methods adopted for 	TC 4 Industry Commons (IC) metadata models (Management technology as data lineage solution for cross-sectorial data sharing – DVC2DVC data sharing)	TC 5 Common, sectorial and shared industrial ontologies & semantics adopted by the DVC (Agreed data models and vocabularies to be respected for publication and sharing of data across the DVC)	TC 6 Data Asset Value Exchange Mechanisms(Framework defining the long-term relationship of the DVC members and the selected monetisation schemes adopted – data licensing, monetary transactions, altruism supporting the cost for data quality processes)TC 7 Data Quality Certification Framework.	



Legal				
Legal pare	nt clauses	Additional types of clauses	Points of attention	
Data-related clauses: SC 1 Data availability and quality SC 2 Data Protection SC 3 Data access SC 4 Re-use of data SC 5 Security measures and technical means for data exchange	Other core contractual clauses: SC 10 Liability SC 13 (Alternative) dispute resolution	Fairness metricsFormulate and describe ethical principlesDefining industry and case-specific transparency and descriptive criteria	Limitations due to different sectorial regulation (due diligence highly advisable to map different legal obligations and thus limitations on the scope of the agreement)	
<u>IP-related clauses:</u> SC 6 Access to background IP		Defining minimum uniform legal requirements		



4. Recommendations for industry and policy makers

Luca Turturro, Ecorys



Recommendation 1: Create the enabling conditions to build trustworthy relationships among stakeholders and support a trusted environment for data sharing within and across industries

Building trust

- Doubts on data (re)use
- Business ethics and general principles
- Lack of clarity on practical implications of existing regulations
- Distrust on integrity of the systems
- Fear for data breach and loss
- Protect commercially sensitive and personal data
- Protect competitive advantage



Specific industry and policy actions to build trust

Policy support	Industry action	Policy support
Guidelines and model agreements/standardised templates and clauses for B2B	Develop technical specifications/clauses on dynamic aspects of data (e.g. suitable data rights management	Legal clarification on the concept of 'data intermediary
data sharing Innovative data governance structures and sector-specific	frameworks, dynamic IP management) Develop technical specifications/clauses concerning operational and technical	Support high-impact technology though research and innovation actions
collaboration models / EU-wide data governance practices	Endorse available reference architectures to enforce data-related contractual clauses	Clarification and guidance on how to implement data anonymisation
collaborative testing ground	Develop sectoral and cross-sectoral codes of conduct	

Main impacts of proposed actions on industrial competitiveness





Recommendation 2: Establish pathways towards the development of common approaches to data quality assessment and assurance, and improve data access and interoperability

Data quality, access and interoperability

- Measurement of data quality
- Lack of common approaches to assess data quality
- Lack of high-quality datasets
- Unclear how to support claims on data quality
- Liability issues
- Absence of a clear legal status

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Specific industry and policy actions on how to improve data quality, access and interoperability

Policy support

Promote the definition of harmonised criteria/guidelines to assess the quality of datasets

Support the development of a data quality certification framework or data quality seals

Support identification of relevant standards e.g. through establishment of a coordination body

Industry action

Develop contractual clauses to increase the quality and value of data, e.g. standards & methods adopted for data quality assurance, industry commons metadata models, common industrial ontologies & semantics

Include procurement requirements and obligatory use of standards in contracts on interoperability, address responsibility for misuse

Identify a list of standards that need to be supported in the data spaces for each sector and levels of interoperability

Policy support

Promote the development and use of standardised data licensing models /agreements

Promote common spaces allowing for testing of various types of data quality according to diverse scenarios

Set up independent subjects/bodies that serve as a data quality test engine

Main impacts of proposed actions on industrial competitiveness





Recommendation 3: Develop common understandings of data asset value and set up mechanisms to capture and fairly redistribute the benefits of data sharing

Data value

- Difficulty to establish a "fair price for data"
- Uncertainty on (magnitude of) expected costs and benefits and their distribution
- Complex to monetise externalities
- Complex pricing of datasets and valorisation of data
- Uncertainty on status and value of data

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Specific industry and policy actions on how to improve data valuation

Policy support	Industry action	Policy support
Dissemination of good practices and guidelines to define data valuation/monetisation models	New collaborative arrangements for the fair allocation of costs and benefits, e.g. data trust, data cooperatives	Define specific rights with regards to "co-generated data" and distribute them amongst co- contributors
Regulation of unfair B2B	Develop/agree on common valuation models	
economy	Develop/focus on clause(s) to guarantee fair treatment, e.g. <i>performance</i> <i>obligations and data sharing rules</i>	
	Develop use cases and a taxonomy to	

identify value classes

Main impacts of proposed actions on industrial competitiveness





Recommendation 4: Take action to address technical challenges and improve the clarity of data sharing regulations

Technical and regulatory complexity

- Complexity of technical aspects and legal framework
- Lack of knowledge and skills required
- High coordination costs
- Lack of regulatory harmonisation
- Legal uncertainty (data protection and competition law)



Specific industry and policy actions on how to address technical and regulatory complexity

Policy support	Industry action	Policy support	
Clarify essential concepts of liability	Leverage existing entities for safe experimentation and validation under recognised labels, seek tailored advice and technical expertise	Additional guidance/practicable guidelines on how competition law applies	
Regulatory sandboxes		Unambiguous legal	
European structural enablers for data-sharing (coordination bodies for exchange of best practices)	Promote IAs use cases in operations to shed light on technical issues in advance	model contracts/ contractual clauses	
	Include further information duties in IAs	(EU-wide) soft infrastructures and/or trusted frameworks for cross-sectoral data governance	

Main impacts of proposed actions on industrial competitiveness

Digital competitiveness components **Company level** Value chain level Wider Reduced Improved Wider Improved Regulatory adoption/ transaction/ Increased Reduced innovation technology investment in innovation capability/ compliance productivity labour costs access/ digital digital skills costs awareness technologies High High High Medium Medium Industry Actions Policy High Medium High High Medium



5. Industry Agreements, Data Ecosystems and Value Chains: Moving Ahead

Pär Weström, CARSA Industry representatives

Summary and overview: the European Digital Ecosystem





Moving Ahead: How can the study results be used?





Moving Ahead: Examples of use of the study results



Fill Team Management Research & Development Harald Sehrschön



SQS Interoperability Testing Services Lab Josu Fernandez and Aitor Celaya



Vinges Logistic Group General Director Dainius Petravicius



Visual Components Research and Development Manager Fernando Ubis



More examples of use?

Contact the project team: ind-agreements@carsa.es



6. Closing and outlook

Yves Paindaveine, DG CNECT

Thank you!



Commission

