Technology and Regulation

From your Smart Watch to the Metaverse

Understanding the Scope of EU IoT Regulation in the Data Act

Author(s)	Petra Sîmpălean, Aurelia Tamò-Larrieux, Konrad Kolling
Contact	Petra.f.simpalean@gmail.com, aurelia.tamo-larrieux@unil.ch, konrad.kollnig@maastrichtuniversity.nl
Affiliation(s)	Petra Sîmpălean, Master of Laws, European Law (Specialising in European Business Law), Maastricht University, Maastricht, The Netherlands. Aurelia Tamò-Larrieux is Associate Professor at Faculty of Law, Criminal Sciences and Public Administration at the University of Lausanne, Switzerland. Konrad Kollnig is Assistant Professor at the Faculty of Law at Maastricht, University, The Netherlands.

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Abstract

This article investigates the definitional underpinnings of the EU Data Act (DA), specifically the concepts of "data", "connected product", and "related service", to reveal how they structure the Act's legal reach and reflect evolving policy priorities. Through the analysis of the DA's legislative journey from Commission proposal to its final form, the article shows how the definitional scope in EU technology regulation is shaped by technological developments, institutional coordination, and stakeholder influence. By tracing these dynamics, the article demonstrates how core definitions serve not simply as technical terms but as strategic instruments for balancing flexibility, legal certainty, and regulatory coherence within the EU's broader digital governance framework. This article contributes to a better understanding of these strategic terminologies in the DA which in light of current calls within the Omnibus acquis for simplifications of data regulation in the EU has become increasingly relevant.

1. Introduction

As President von der Leyen emphasised in her 2019–2024 political guidelines, the EU must "balance the flow and use of data while preserving high privacy, security, safety and ethical standards".[1] This principle has guided a wave of legislative activity under the European Strategy for Data,[2] launched in 2020, which seeks to establish the EU as a leader in the global data economy whilst fostering a "society empowered by data to make better decisions".[3] A pivotal component of this European Strategy on Data is the Data Act[4] (DA). On the 23rd of February, the European Commission shared its long-awaited proposal for this Act.[5] The DA came into force on the 11th of January 2024 and became applicable on the 12th of September 2025.[6] Unlike other regulations at the centre of digital policy discussions, such as the General Data Protection Regulation[7] (GDPR), the DA is the first piece of EU legislation to regulate IoT-generated data.[8] It establishes a framework for clear and fair rules for accessing and using data within the European data economy by increasing legal certainty for companies and consumers involved in IoT data generation and by mitigating the abuse of contractual imbalances that impede equitable data sharing.[9] By delineating rights and responsibilities concerning data sharing, the DA seeks to address the interests of data holders and users, as well as those of the manufacturers of connected products and related service providers, whereby the wider use of data in the digital economy is promoted.[10]

While a promising and ambitious piece of technology regulation, the exact scope of the DA remains unclear. Key definitions such as "data", "connected product" and "related service", which define the breadth of the obligations listed in the DA, have not been discussed or clarified in past (academic) literature. Such a discussion, as well as an analysis of how the scope of the DA evolved, is needed in order to understand the effect that the DA will have on IoT products and the digital economy at large.[11] For example, in September 2025, Meta released the Ray-Ban Display, glasses that record the environment and enhance it with AI. Meanwhile, in the same month, Apple released an update to its iOS operating system that allows its headphones to be used for real-time translation of foreign languages with AI. Both of these products are part of a wider trend wherein digital surveillance is increasingly adopted into our day-to-day lives.

In this context, it is important to recognise that technology regulation rarely emerges in a linear fashion, due to the relationship between technological change and law being characterised as "varied, messy, and political".[12] Definitions and regulatory scopes are renegotiated during legislative processes, which reflects not only technological change but also economic interests and institutional priorities and the need for legislative coherence. The DA's trajectory can therefore be used to illustrate more broadly how EU technology

1. Ursula von der Leyen, *A Union That Strives for More: My Agenda for Europe: Political Guidelines for the next European Commission 2019 2024* (*Publications Office of the European Union*, 2019), 16 https://data.europa.eu/doi/10.2775/018127 accessed 1 May 2025.
2. Commission, 'Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (A European Strategy for Data)' COM (2020) 66 final (European Data Strategy).
3. Von der Leyen (n 1)
4. Regulation (EU) 2023/2854 of the European Parliament and of the Council of 13 December 2023 on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act) (Text with EEA relevance) [2023] OJ L 2023/2854 (Data Act).
5. Commission, 'Proposal for a Regulation of the European Parliament and of the Council on harmonised rules on fair access to and use of data (Data Act)' COM (2022) 68 final (DA Proposal).
6. European Commission, 'Data Act' (*Shaping Europe's Digital Future*, 2024) https://digital-strategy.ec.europa.eu/en/policies/data-act accessed 3 February 2025.
7. Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (Text with EEA relevance) [2016] OJ L 119 (GDPR).
8. Recital 14 Data Act (n 4) .
9. Commission, 'Data Act' (n 6).
10. Thomas Tombal and Inge Graf, 'Chapter VIII: The European Data Act: A Horizontal Building Block for the Data Economy?' in B. van der Sloot, G. Monti and F. Bostoen (eds), *From Regulating Human Behaviour to Regulating Data* (Open press TIU 2025) 134.
11. Maitrayee Pathak, 'Data Governance Redefined: The Evolution of EU Data Regulations from the GDPR to the DMA, DSA, DGA, Data Act and AI Act' (2024) 10(1) EDPL 43.
12. Meg Leta Jones, 'Does Technology Drive Law? The Dilemma of Technological Exceptionalism in Cyberlaw' (2018) 2 JLTP 101.

regulation evolves: through iterative adjustments, political compromise, and the search for balance between flexibility, legal certainty, and regulatory effectiveness.

In this article, we therefore analyse foundational elements of the DA and their role in shaping the future of IoT products and AI as part of the EU's broader digital policy framework, by examining the legislative discussions on the scope of the DA as well as the extent to which external influences have affected its scope.

This article is structured as follows. Section 2 situates the DA within the broader European regulatory landscape by examining its role in the European Strategy for Data and its relationship with other legislative instruments. Section 3 focuses on the evolution of the material scope of the Regulation, analysing the key definitions of "data", "connected product", and "related service" and how these have changed throughout the legislative process. Section 4 explores possible external factors that influenced these changes, with a particular focus on lobbying activity that shaped the DA. Section 5 contextualises the findings of the article and reflects on the future applicability of the DA.

2. The DA's Role in the European Regulation of Data

The European Strategy for Data[13], published in 2020, aims to create the necessary conditions for a genuine European data economy that encourages the better use of data, positioning the EU as a global leader in the digital economy.[14] The strategy views data as an economic asset and driver for economic growth. Within this context, the creation of a single market for data is fundamental. The envisaged data space would enable the use of data in both economic and societal contexts while preserving the control of those who generate the data, whether businesses or individuals.[15]

The Strategy identifies several problems that are holding the EU back from fully maximising its potential in becoming a global leader in the digital economy. These challenges are classified into eight core categories: (1) fragmentation of the regulatory framework at Member State level, undermining the functioning of the internal market; (2) the limited availability of data for innovative re-use; (3) imbalances in market power; (4) insufficient interoperability and data quality; (5) shortcomings in data governance, implying the need for organisational approaches and structures that would enable data-driven innovation; (6) underdeveloped data infrastructure and enabling technologies; (7) the need to enhance individuals' ability to exercise their data rights, including through improved digital literacy; and (8) cybersecurity.[16]

To address these challenges, the Strategy is structured around four central pillars, which collectively aim to deliver a coherent and systematic response to the problems named above. The first pillar relates to cross-sectoral governance for data access and use, namely ensuring better access to, and more responsible use of, data.[17] This need is the result of a fragmented data-sharing landscape within the EU, caused by the inconsistent approach to data sharing between sectors and between the Member States.[18] The second pillar relates to enablers, namely investments in data and strengthening Europe's digital sovereignty by improving its capabilities for hosting, processing and using data and interoperability.[19] The third pillar refers to improving competences by empowering individuals with respect to their data through enforcing their rights when it comes to data they generate.[20] For legal persons, particularly SMEs, the Strategy envisions capacity-

13. European Data Strategy (n 2).
14. Marc A Stuhldreier, 'Fostering Innovation by Utilising Big Data: The Data Act and the Risk of Quasi-Exclusivity Reinforcing Data Lockups' in Nadia Naim (ed), *Developments in Intellectual Property Strategy: The Impact of Artificial Intelligence, Robotics and New Technologies* (Springer International Publishing 2024) 38.
15. Maria Luisa Chiarella and Manuela Borgese, 'Data Act: New Rules about Fair Access to and Use of Data' (2024) 10 Athens Journal of Law 47, 52.
16. European Data Strategy (n 2) 6-11.
17. Jones (n 12) .
18. Sander Middendorp, 'Aligning Our Goals with the European Data Strategy' (*Centre of Excellence for Data Sharing & Cloud*, 1 June 2020) https://coe-dsc.nl/aligning-our-goals-with-the-european-data-strategy/ accessed 3 May 2025.
19. European Data Strategy (n 2), 15-16.
20. European Data Strategy (n 2) 20.

building schemes and specific investment funds in order to promote the creation of better opportunities in the data economy.[21] The fourth and final pillar calls for the establishment of Common European Data Spaces in strategic sectors and domains of public interest.[22]

To date, two core legislative instruments have been adopted to operationalise the Strategy. They are the Data Governance Act[23] (DGA) and the DA. The DGA is a cross-sectoral instrument that sets out a regulatory framework for data intermediaries, which boosts data sharing between interested parties and encourages the sharing of data for altruistic purposes. It aims to regulate the reuse of publicly held and protected data whilst promoting trust in voluntary data sharing for the benefit of both citizens and businesses.[24] The DA, on the other hand, aims to create incentives for data-sharing with the ultimate goal of ensuring fairness in the allocation of value of data amongst the actors in the digital economy.[25] It is the first instrument to attempt horizontal and legally binding regulation for the sharing of both personal and non-personal data.[26] The interaction between the two instruments is particularly significant. The DGA has set the basis on which the collection flow set by the DA is based, though facilitating data sharing as set out above and creating the processes and structures needed.[27] Importantly, the DA considers data holders as entities with specific obligations, whereas the DGA primarily views them as right holders. This shift signals a broader evolution in the EU's approach to data regulation, where entities may simultaneously bear rights and duties, particularly in the context of the emerging data economy.[28]

These instruments are embedded in a rich set of regulations on data governance, digital services governance and AI governance, such as the DMA (Digital Markets Act), the DSA (Digital Services Act) and the AIA (Artificial Intelligence Act).[29] Each instrument addresses a distinct but interrelated aspect of the data economy.

Within the framework of the European Strategy for Data, the DA is a central legislative instrument designed to implement the Strategy's first pillar, namely the establishment of a cross-sectoral governance framework for data access and use. This is done through the introduction of harmonised rules on fair access to and use of data, applicable across all sectors of the economy.[30] The Act seeks to address structural deficiencies identified in the Strategy by incentivising data availability for access and re-use,[31] while correcting market imbalances and legal fragmentation resulting from the concentration of data in the hands of a small number of large enterprises in the digital economy.[32] These have hindered the development of a robust and inclusive data economy.

These concerns are directly addressed through mandatory data-sharing obligations between businesses and their users (B2C context), between businesses (B2B context), and between businesses and public sector bodies (B2G context), each governed by different provisions in the Act. Their application is particularly regarding data generated by connected products and related services, in order to make available a greater quantity of both personal and non-personal data.[33] By empowering users to access and share such data,

21. European Data Strategy (n 2) 21.
22. European Data Strategy (n 2) 21.
23. Regulation (EU) 2022/868 of the European Parliament and of the Council of 30 May 2022 on European data governance and amending Regulation (EU) 2018/1724 (Data Governance Act) (Text with EEA relevance) [2022] OJ L 152 (DGA).
24. European Commission, 'Data Governance Act Explained' (*Shaping Europe's Digital Future*, 14 October 2024) https://digital-strategy.ec.europa.eu/en/policies/data-governance-act-explained accessed 10 April 2025.
25. European Commission, 'Data Act Explained' (*Shaping Europe's Digital Future*, 29 January 2025) https://digital-strategy.ec.europa.eu/en/factpages/data-act-explained accessed 10 April 2025.
26. Tombal and Graf (n 10) 133.
27. Chiarella and Borgese (n 15) 57-58.
28. Pathak (n 11) 53.
29. Stuhldreier (n 14), 39.
30. Article 1 Data Act (n 4).
31. Federico Casolari, Carlotta Buttaboni and Luciano Floridi, 'The EU Data Act in Context: A Legal Assessment' (2023) 31 International Journal of Law and Information Technology 399, 402.
32. Recital 40 Data Act (n 4).
33. Chiarella and Borgese (n 15) 53.

and through the regulation of data access and its use, the Act aims to unlock previously enclosed data and enable its reuse by third parties, thereby fostering a broader, fairer, and more competitive data economy.[34]

The DA also implements third pillar of the Strategy by empowering individuals and SMEs by giving users the right to access and share data from connected products, thereby giving them more control over who can access and use the data generated by connected products and extending data portability beyond personal data.[35] SME access is also promoted by excluding gatekeepers from benefiting from these rights.[36] The DA also includes fairness clauses and default access entitlements that redistribute data value more equitably.[37] Additionally, the DA, through the provision of horizontal, cross-sectoral data access rules, promotes Pillar IV of the Strategy, as it is furthering the foundations needed for the functioning of Common European Data Spaces.[38]

In this way, the DA not only facilitates the creation of a single European market for data but also aligns with the Union's broader ambition to reinforce its digital sovereignty while safeguarding fundamental rights and European values. As such, the Act plays a pivotal role in bridging the digital divide between the EU and global competitors, notably the United States and China, as being part of the EU's quest for strategic autonomy in the digital sphere.[39]

Figure 1 illustrates the evolution of the DA with various legislative steps that occurred during the timeframe from early 2022 to its publication in 2024.

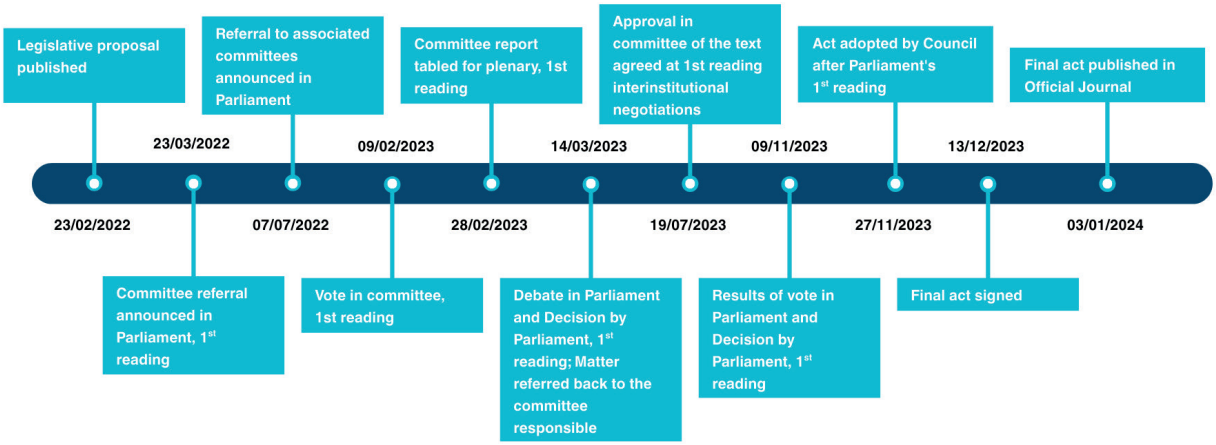

Figure 1. Timeline (key dates)

3. Showcasing the Evolution of Technology Regulation in the EU by the Example of the DA

Technology regulation more generally and the DA in particular evolve through iterative adjustments and political compromises. This article analyses the DA's foundational elements and legislative discussions around its scope to illustrate this broader regulatory evolution and understand how the Act will shape the future of IoT and AI within the EU's digital policy framework. Such an endeavour seems ever more needed

34. Stuhldreier (n 14) 40.
35. A European Strategy for Data (n 2) 21.
36. Recital 40 Data Act (n 4).
37. Article 13 Data Act (n 4).
38. A European Strategy for Data (n 2) 21.
39. Theodore Christakis, '"European Digital Sovereignty": Successfully Navigating Between the "Brussels Effect" and Europe's Quest for Strategic Autonomy' (Social Science Research Network, 7 December 2020) ii https://papers.ssrn.com/abstract=3748098 accessed 3 May 2025.

with the Digital Omnibus Acquis aimed at simplifying data-related regulations within the EU, including the DA. Determining the needs for amendments should be based on a sound understanding of the scope of different regulations and the factors that influenced it.

3.1 Current scope of the DA

3.1.1 The Definition of "Data"

"Data" is defined in Art. 2(1) as "any digital representation of acts, facts or information and any compilation of such acts, facts or information, including in the form of sound, visual or audio-visual recording". This broad, general definition has also been adopted in the DGA and DMA and encompasses both "personal data" and "non-personal data", distinguishing it from the definition in the GDPR, which only covers "personal data" in Art. 4(1). Additionally, unlike the GDPR, the DA does not equate data to information.[40]

Importantly, this definition only applies to data in digital form.[41] The scope of what qualifies as "data" under the Act is subject to several limitations. Both raw data and pre-processed data fall within the scope of the DA, but data which has been subject to various forms of analysis and has thus transformed into information falls outside of the scope.[42] This ensures that only data that is directly representative of the acts or facts it records is subject to sharing obligations.

The scope of the definition is further refined by Recital 16. Since the DA aims to ensure that users of connected products can benefit from data that is collected from sensors that are embedded in these products, data from unrelated software and content, such as textual, audio, or audiovisual, will fall outside of the scope. This refers to data that is generated when the user records, transmits, displays or plays content, but also data that is obtained, generated or accessed from the connected product that is on behalf of third parties, the purpose of storing or other processing operation.[43] Examples of such data that are covered by the regulation are the number of times a smart fridge is opened, the size of a room vacuumed by a Roomba, or the errors of a smart speaker.[44]

Within Chapter II, which governs B2C and B2B data access and use, data access rights under Articles 3, 4, and 5 apply to specific categories of data, namely "product data" and "related service data", as defined in Arts. 2(15) and 2(16). These must be "readily available" to the data holder, meaning that the data can be accessed without disproportionate effort as a result of the manufacturer's technical design.[45] As a general rule, only such data that is directly generated by the connected product or its related service and is technically accessible to the data holder falls under the mandatory sharing obligations.[46]

In addition to the core definition of "data", the Act provides further elaborations in Art. 2, including definitions for "metadata" (Art. 2(2)), "readily available data" (Art. 2(17)), and "exportable data" (Art. 2(38)). These definitions are used throughout the regulation in specific articles and chapters, shaping the scope of various data-sharing obligations.

3.1.2 The Definition of "Connected Product"

The definition for "connected product" is laid down in Art. 2(5) and consists of three cumulative criteria. First, the item must be capable of obtaining, generating, or collecting data about its use or environment. This includes both actively collected data, through user interaction, and passively generated data, such as by embedded sensors. Secondly, the item must be able to communicate the product data collected via various communication services. Thirdly, its primary function must not be that of storing, processing or transmitting

40. Moritz Hennemann and others, *Data Act: An Introduction* (1st edn, Nomos 2024) 46.
41. Ulla-Maija Mylly, 'Trade Secrets and the Data Act' (2024) 55 IIC 368, 372.
42. Recital 15 Data Act (n 4).
43. Recital 16 Data Act (n 4).
44. Teodora Groza and Beatriz Botero Arcila, 'The New Law of the European Data Markets: Demystifying the European Data Strategy' (2024) 24 Global Jurist 321, 348.
45. Article 2(17) Data Act (n 4).
46. Article 3(1) Data Act (n 4).

the data on behalf of any other party other than the user. This final condition serves to distinguish connected products from general-purpose data processing infrastructures, such as servers or cloud services, which are thus excluded from the scope of the mandatory data-sharing obligations in Chapter II.[47] This does not apply, however, when products such as routers or servers are owned, rented, or leased by the user.[48] It's relevant to note that this definition mainly refers to IoT products[49] and that it is broader than the one given in the Commission's initial proposal for the Regulation. This aspect will be considered in detail later in this paper.

Connected products, as defined in the DA, encompass a wide array of devices that are found in all aspects of the economy and society.[50] These include, but are not limited to, industrial machinery, medical devices, smart home appliances, consumer electronics, smartphones, and TVs.[51] In order to fall within the scope of the DA, a connected product must be placed on the Union market,[52] thereby excluding prototypes and devices not yet commercialised within the EU.[53]

3.1.3 The Definition of "Related Service"

"Related service" is defined in Art. 2(6) as "a digital service, other than an electronic communications service, including software, which is connected with the product at the time of the purchase, rent or lease in such a way that its absence would prevent the connected product from performing one or more of its functions, or which is subsequently connected to the product by the manufacturer or a third party to add to, update or adapt the functions of the connected product". This definition reveals that a related service is not a mere accessory or independent feature but rather it is a functionally integrated and indispensable feature or extension of the connected product.[54]

The European Commission underlined two factors that would determine whether a digital service can qualify as a related service. First, there must be a bidirectional exchange of data between the connected product and the service provider. Second, the service must affect the connected product's functions, behaviour, or operation.[55] This underlines that the interdependence between the two must be of a functional nature.[56] Digital services that cannot be interpreted as related services are power supply, the supply of connectivity, and general aftermarket services.[57] Even though most but not all digital services will fall under the category of related services, practice and the courts' interpretation will serve to further delineate whether a digital service is a related service.[58]

An example of a related service would be apps that allow connected products, such as smart home devices, to be controlled.[59] Consider, for instance, that a user purchases a smart thermostat, such as the Google Nest Learning Thermostat (4th Gen)[60] for their home and installs the Google Home app in order to fully benefit from the thermostat's capabilities. This app allows the user to set up, manage, and control the thermostat from anywhere. Features such as scheduling, temperature adjustments, and integration with

47. Christian Frank and Julia von Imhoff, 'Data Access under the Data Act - A Practical Guidance to More Clarity and Compliance Demonstrated in Three Practice-Oriented Scenarios' (2024) 25 Computer Law Review International 165, 166.
48. Commission, 'Frequently Asked Questions - Data Act' (2024), 8 https://digital-strategy.ec.europa.eu/en/library/commission-publishes-frequently-asked-questions-about-data-act accessed 6 May 2025.
49. Recital 14 Data Act (n 4) .
50. Recital 14 Data Act (n 4).
51. Commission, 'Frequently Asked Questions - Data Act' (n 48) 7.
52. Article 2(22) Data Act (n 4).
53. Recital 14 Data Act (n 4).
54. Frank and Imhoff (n 47) 167.
55. Commission, 'Frequently Asked Questions – Data Act' (n 48) 9.
56. Frank and Imhoff (n 47) 167.
57. Recital 17 Data Act (n 4) .
58. Commission, 'Frequently Asked Questions – Data Act' (n 48) 9.
59. 'The EU Data Act: Part 1 – What Does It Regulate?' https://www.osborneclarke.com/insights/eu-data-act-part-1-what-does-it-regulate accessed 16 April 2025.
60. 'Nest Learning Thermostat' (*Google Store*) https://store.google.com/product/nest_learning_thermostat_3rd_gen?hl=nl accessed 17 April 2025.

other smart home devices are unlocked with this app.[61] Because the app is functionally integrated with the thermostat, and it can control the operation of the thermostat through a bidirectional exchange of data, it will qualify as a related service under the DA.

3.2 Detailed Examination of the Changes in Scope

3.2.1 "Data"

As an introductory remark, it's important to note that the definition of "data" in Art. 2(1) remained unchanged throughout the legislative process, despite attempts to narrow down the scope. However, in response to concerns about clarity, legal certainty, and scope, additional definitions for specific types of data were proposed at various stages and later introduced in the final version of the DA. These aimed to refine the scope of the DA while ensuring consistency with existing EU regulations, primarily the GDPR.

In the proposal for the DA, only the definition of "data" was provided in Art. 2(1), without any distinctions being made between different types of data.[62] This was scrutinised by the European Economic and Social Committee, who called for a clearer definition of the categories of data, as well as ensuring the rights of the users over their data are well defined. This recommendation likely influenced the subsequent introduction of separate definitions for specific types of data.[63]

The first new additions to the DA came in the first Committee on Industry, Research and Energy (ITRE) Draft Report[64], where preliminary definitions for "personal data" and "non-personal" data were added through Amendments 30 and 31. These amendments aimed to align the DA with the GDPR, particularly in regard to "personal data", which was defined in the same terms as Art. 4(1) GDPR.

In the proposed amendments by the same committee[65], several of the amendments aimed to refine the scope of "data" in Art. 2(1) and introduce distinct definitions for specific data categories. The new categories introduced by Amendments 403 to 414 included definitions for "metadata", "diagnostic data", "raw data", "falsified data", and "anonymised data". The justifications included for these amendments indicated the need for legal certainty, arguing that without clearer distinctions between data categories, regulatory ambiguities could arise.

The same trend for the introduction of more specific definitions for data arose in the proposed amendments by the Committee on the Internal Market and Consumer Protection (IMCO)[66]. However, a specific focus was given on ensuring alignment with the GDPR, emphasising a need to avoid conflicts between the DA and existing data protection rules. New data categories, providing similar definitions as the ITRE amendments, were proposed. Amendment 222 defined "metadata", Amendment 223 introduced "diagnostic data", and Amendment 224 distinguished "non-personal data" from GDPR-governed personal data. Amendments 226 and 229 defined "readily available data" and "raw data". These aimed to reduce legal uncertainty and protect commercially sensitive data, though not all were adopted in the final version of the DA.

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61. Nena Farrell, 'Google's 4th-Gen Nest Learning Thermostat Isn't Just Pretty (but It's Also Very Pretty)' (*WIRED*, 6 September 2024) https://www.wired.com/review/google-nest-learning-thermostat-4th-gen/ accessed 16 April 2025.
62. Article 2(1) DA Proposal (n 5) art 2(1).
63. European Economic and Social Committee, 'Opinion of the European Economic and Social Committee on 'Proposal for a Regulation of the European Parliament and of the Council on harmonised rules on fair access to and use of data (Data Act)'' [2022] OJ C 365/18 (EESC Opinion), para 2.2.
64. Committee on Industry, Research and Energy, 'Draft Report on the Proposal for a Regulation of the European Parliament and of the Council on Harmonised Rules on Fair Access to and Use of Data (Data Act)' https://www.europarl.europa.eu/doceo/document/ITRE-PR-732704_EN.html accessed 23 February 2025 (ITRE Draft Report).
65. Committee on Industry, Research and Energy, 'Amendments 295 - 569 - Draft Opinion Harmonised Rules on Fair Access to and Use of Data (Data Act)' https://www.europarl.europa.eu/doceo/document/ITRE-AM-738511_EN.pdf accessed 23 February 2025 (ITRE Amendments).
66. Committee on the Internal Market and Consumer Protection, 'Amendments 87 - 286 - Draft Opinion Harmonised Rules on Fair Access to and Use of Data (Data Act)' https://www.europarl.europa.eu/doceo/document/IMCO-AM-738591_EN.html accessed 23 February 2025 (IMCO Amendments).

In its first reading on 14 March 2023, the European Parliament (EP) adopted a revised text of the DA[67], incorporating changes to Art. 2(1) definition of "data" and related categories. The adopted text included definitions introduced in earlier amendments, including "personal data", which was aligned with Art. 4(1) GDPR, and "non-personal data", defined as all other data. Additionally, "metadata" was defined as a structured description of data content to facilitate its discovery or use.

During the interinstitutional negotiations[68], several new definitions were agreed upon and later introduced in the final version of the DA. The final agreed text, adopted on 22 December 2023, retained the broad definition of "data" as originally set out in Art. 2(1). However, it formally introduced the new definitions for the following types of data: "personal data", "non-personal data", "metadata", "product data", "related service data", "readily available data" and "exportable data".

Ultimately, the evolution of Art. 2(1) and related definitions reflects, on the one hand, a narrowing of the scope for what falls under the definition of "data" under the DA, due to the addition of specified definitions, which also improve legal certainty. On the other hand, the scope remains broad due to the open definition of "data". Where a provision does not refer to a specific data category, the broad definition of "data" as provided by Art. 2(1) continues to apply. This can be perceived as a positive by some, as it is indicative of a technology-neutral regulation that maintains its flexibility and adaptability in application but can also be seen in a negative light, where it is unclear what exactly will fall under the DA's scope.

3.2.2 "Connected Product"

Unlike what we have seen with the definition of "data", the definition of "connected product" in Art. 2(5) evolved more throughout the legislative process to ensure legal certainty, whilst clarifying the scope and applicability of the Regulation. The changes primarily focused on refining the types of data such products generate and communicate, as well as specifying the limitations of their primary function.

In the Commission's proposal, the term "product" was defined broadly as a tangible, movable item that obtains, generates, or collects data and can communicate data via a publicly available electronic communications service. This definition excluded products that have the primary function of storing and processing of data[69] and it did not yet include the specific term "connected product", which would later become the standardised terminology.

The EESC suggested broadening the scope of the regulation to cover all physical products that obtain, generate or collect data concerning their performance, use or environment, ensuring that the definition captured a wide range of IoT devices.[70] Additionally, they suggested that the definition should include personal computers, tablets, smartphones and other similar connected devices.[71]

The European Central Bank (ECB) also offered insights on the definition of "product", by highlighting practical and real-world constraints and challenges that would be faced in the field of payment services and instruments without a clarification of specific products that can fall under the definitions offered in the Regulation.[72] They proposed that only products that are in the possession of the user should fall within the scope of the Regulation, and that the Regulation should exclude certain types of data, such as data produced by the public sector.

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67. European Parliament, 'Amendments adopted by the European Parliament on 14 March 2023 on the proposal for a regulation of the European Parliament and of the Council on harmonised rules on fair access to and use of data (Data Act)' [2023] OJ C, C/2023/419 (EP Amendments Adopted Through Partial Vote).
68. European Parliament, 'Provisional agreement resulting from interinstitutional negotiations - Proposal for a regulation of the European Parliament and of the Council on harmonised rules on fair access to and use of data (Data Act) (COM(2022)0068 – C9-0051/2022 – 2022/0047(COD))' https://www.europarl.europa.eu/RegData/commissions/itre/inag/2023/07-14/ITRE_AG(2023)751822_EN.pdf accessed 6 May 2025 (Interinstitutional Negotiations).
69. Article 2(2) DA Proposal (n 5) art 2(2).
70. EESC Opinion (n 63) para 1.6.
71. EESC Opinion (n 63) para 4.9.
72. European Central Bank, 'Opinion of the European Central Bank of 5 September 2022 on a proposal for a regulation on harmonised rules on fair access to and use of data (Data Act)' [2022] OJ C 402, para 2.1.

The ITRE Committee Draft Report suggested eliminating the "movable" nature of the item from the definition, as it should not be a prerequisite in order to fall under the definition of "product".[73] This is mostly due to the fact that some immovable items can be IoT devices.[74] A more substantial change came from the amendments proposed by the same committee, especially Amendment 416, which was the first to introduce the concept of "connected product".[75] The definition proposed referred to a tangible item that, "through its technical design and features, including sensors and in-device software", obtains or generates transmissible data concerning its use or environment. The justification for this was the fact that, to increase legal certainty, the exclusion of clear data categories is preferred to the exclusion of product groups. By explicitly connecting the definition to embedded technologies, such as sensors and in-device software, this definition points more towards the regulation of IoT devices specifically, therefore broadening the scope of products regulated. Importantly, this amendment also clarified the fact that the primary function of the item must not be that of storing and processing data "on behalf of others", which is a specification which will later be adopted in the final version of the definition, though in a different form.

The Committee on Civil Liberties, Justice and Home Affairs (LIBE) added further details to the data transmission methods in the definition.[76] These now included, beyond "publicly available electronic communications services", also physical connections and wireless networks connected to an electronic communication service, thereby ensuring that a wide variety of connectivity scenarios were covered. Additionally, when referring to what falls outside of the definition, specific reference was made to items that are primarily designed to display or play content, or to record and transmit content, including general-purpose computers, tablets and smartphones, cameras, sound recording systems and text scanners. This addition did not make its way to the final definition of "connected product", but it was partially included in Recital 16, which refers to data that falls outside of the scope.

Further refinements to the text emerged at the 1st reading of the EP, adopted through partial vote, where the notion of "accessible data" was introduced.[77] Additionally, "on-device access" was incorporated as an alternative form of communication, expanding the concept of connectivity. Although the concept of "accessible data" was removed during the interinstitutional negotiations[78], the reference to "on-device access" as a method of communication that the item is able to do was retained in the final version of the Act, and it was further added that the data communicated by the item is "product data". The position adopted by the EP at first reading in November, which is the text as it will appear in the final version of the act, building on the ITRE Committee Draft Report, clarifies that items which transmit or process data on "behalf of any other party other than the user" will fall outside of the scope of the definition.[79]

The main differences between the final text of the DA and the initial proposal are thus the following. First, the term "connected product" is used instead of "product", denoting the fact that the products regulated by the DA are IoT devices. Second, specifying that the connected product must be able to communicate only "product data", adding the methods of communication through physical connection or on-device access. Third, limiting the scope of devices to those whose primary function is not to process, store or transmit data on behalf of any other party other than the user, but therefore including items that have the primary function of doing so on behalf of the user.

73. ITRE Draft Report (n 64).
74. Committee on Legal Affairs, 'Amendments 115 - 473 - Draft opinion Harmonised rules on fair access to and use of data (Data Act)', Amendment 205 https://www.europarl.europa.eu/doceo/document/JURI-AM-738512_EN.pdf accessed 6 May 2025.
75. ITRE Amendments (n 65).
76. Committee on Civil Liberties, Justice and Home Affairs, 'Opinion of the Committee on Civil Liberties, Justice and Home Affairs for the Committee on Industry, Research and Energy on the proposal for a regulation of the European Parliament and of the Council on harmonised rules on fair access to and use of data (Data Act)', Amendment 62 https://www.europarl.europa.eu/doceo/document/LIBE-AD-737389_EN.pdf accessed 6 May 2025 (LIBE Opinion).
77. EP Amendments Adopted Through Partial Vote (n 67).
78. Interinstitutional Negotiations (n 68).
79. European Parliament, 'Position of the European Parliament adopted at first reading on 9 November 2023 with a view to the adoption of Regulation (EU) 2023/... of the European Parliament and of the Council on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act)' https://www.europarl.europa.eu/doceo/document/TC1-COD-2022-0047_EN.pdf accessed 6 May 2025 (Position of the EP).

Additionally, the changes made to Recital 15 during the legislative process must also be considered in the discussion of the definition of "connected product". In the Proposal for the DA, Recital 15 listed specific items that fall outside the definition, such as personal computers, servers, tablets and smartphones, cameras, webcams, sound recording systems and text scanners. The removal of this list in the final version of the DA is unfortunate because it decreases legal certainty, which in turn can create certain ambiguities as to the specific items that fall under the definition, or which are excluded.

3.2.3 "Related Service"

The definition of "related service" underwent a series of refinements during the legislative process to improve legal certainty, clarity and preciseness of the definition. The changes focused on developing a definition that keeps in mind the complexity of regulating IoT devices.

In the original proposal of the DA, a "related service" was defined as "a digital service, including software, which is incorporated in or inter-connected with a product in such a way that its absence would prevent the product from performing one of its functions".[80] At this stage, the definition was relatively narrow and lacked legal certainty, as it did not specify whether digital services incorporated or inter-connected after the initial transaction would fall under the scope of this definition.

The ITRE Committee Draft Report introduced a more precise definition that included that the digital service should be inter-connected with the connected product at "the time of the purchase, rental or leasing agreement".[81] In the subsequent amendments tabled in the ITRE Committee, there seemed to be consensus about excluding electronic communication services from the scope of the definition.[82] Additionally, there was emphasis on the fact that absence of the service must prevent the product from performing one of its "core" functions or one "or more" of its functions, signalling that a related service should be directly related to the functionality of the product. An important amendment to note is Amendment 425, requiring, for the first time, that a related service involve the transmission of data from the connected product to the service provider, signalling the importance of bidirectional data flows as a qualifying element.

The LIBE Committee's Opinion endorsed this view, underlining that a related service must be necessary in order for the product to perform one or more of its functions.[83] During the first reading of the EP, a similar version of the text was proposed, with the differentiation that a related service "involves accessing data from the connected product by the provider or the service".[84]

By the time of the interinstitutional negotiations[85], the definition used matured into the definition which would appear in the final text, with a small difference that during the interinstitutional negotiations, a digital service had to be connected with the product at the time of the purchase, the final text revising this to add that it can be connected with the product at the time of purchase, rent or lease. But, in any case, the related service must enable one or more functions of the connected product. The most substantive difference which appears in the final text but did not appear in the initial proposal is the fact that the related service can be subsequently connected to the product in order to update or adapt the functions of the connected product.

The final formulation reflects a change that incorporates more flexibility, as digital services are not limited to being connected at the time of the purchase. Additionally, the definition is more precise, as electronic communication services are excluded, and the functional interdependence between the related service and connected product is highlighted.

80. Article 2(3) DA Proposal (n 5).
81. ITRE Draft Report (n 64) amendment 34.
82. ITRE Amendments (n 65) amendments 421-425.
83. LIBE Opinion (n 67) amendment 63.
84. EP Amendments Adopted Through Partial Vote (n 67).
85. Interinstitutional Negotiations (n 68).

4. Factors That Influenced the Evolution of the DA's Scope

Through constant and consistent communication between the EU's institutions and interest groups, lobbying plays a crucial factor in helping shape legislative and regulatory decisions of the institutions.[86] As such, one of the EU's main aims when it comes to lobbying has been ensuring that the public is aware of the importance of this practice in its policymaking landscape by promoting transparency and accountability. The lobbying environment is very competitive, consisting of in-house corporate lobbyists; trade and business associations; lobbying consultancies; law firms; think tanks and public relations agencies; civil society networks; individual NGOs; and governmental as well as regional representative organisations. However, this practice in Brussels is considered to be an "elite pluralist arrangement", where large firms, which were encouraged by the EU to develop a broad political profile, are considered to have the best access to the EU institutions.[87]

The EU is committed to maintaining a transparent approach to lobbying[88], through the establishment of the EU Transparency Register (EUTR) in 2011[89]. The register has been reformed in the past and has become mandatory with the introduction of the Interinstitutional Agreement on a Mandatory Transparency Register (2021 IIA)[90], which entered into force in July 2021. Even though the 2021 IIA is not an enforceable EU legislative act, its objective is to enhance public accountability by allowing citizens to track lobbying activities, including through the disclosure of their financial support behind lobbying efforts and the potential influence of lobbyists.[91] It introduced the principle of conditionality, which makes registration in the EUTR a necessary precondition for lobbyists who wish to have certain interactions with members or staff of the signatory institutions.[92]

There are several aspects where the EUTR falls short and makes questionable the true extent to which lobbying is a transparent practice in the EU. Firstly, there is no precondition in any of the signatory institutions that lobbyists must be registered in order to meet staff below the level of Director-General, which effectively excludes meetings with most staff from this requirement.[93] Secondly, the content of the meetings between EU institutions and lobbyists is still not made available to the public.[94] Thirdly, due to the 2021 IIA not being a legislative act, it cannot be used to sanction lobbyists, should they not comply with registration and information requirements.[95] In addition, the EUTR website itself has several limitations regarding completeness and user-friendliness that can defy the goal of easy access of citizens that the EUTR has.[96]

As one of the most important initiatives of the European Strategy for Data, the DA attracted significant lobbying attention throughout its legislative development, at both Commission and Parliament level, as reported by Integrity Watch EU. A total of 348 meetings are recorded as having the DA as their subject

86. David Coen, Alexander Katsaitis and Matia Vannoni, 'Business-Government Relations in the EU: Strategy and Complexity' in David Coen, Alexander Katsaitis and Matia Vannoni (eds), *Business Lobbying in the European Union* (Oxford University Press 2021) 1-3.
87. William Dinan, 'Lobbying Transparency: The Limits of EU Monitory Democracy' (2021) 9 Politics and Governance 237, 238.
88. European Parliament, 'Lobby Groups and Transparency' https://www.europarl.europa.eu/at-your-service/en/transparency/lobby-groups accessed 8 February 2025.
89. Parliament and Commission, 'Agreement between the European Parliament and the European Commission on the establishment of a transparency register for organisations and self-employed individuals engaged in EU policy-making and policy implementation' (Interinstitutional Agreement) [2011] OJ L 191/29.
90. Parliament, Commission and Council, 'Interinstitutional Agreement of 20 May 2021 between the European Parliament, the Council of the European Union and the European Commission on a mandatory transparency register' (Interinstitutional Agreement) [2021] OJ L 207/1 (EUTR).
91. Recital 5 EUTR.
92. Recital 7 EUTR.
93. European Court of Auditors, 'Special Report 05/2024: EU Transparency Register', para 32 https://www.eca.europa.eu/en/publications accessed 6 May 2025.
94. Kim Fyhr, 'The Reform of the EU Transparency Register' (2021) 17 CYELP 177, 202.
95. 'Special Report 05/2024: EU Transparency Register' (n 93) para 76.
96. 'Special Report 05/2024: EU Transparency Register' (n 93) para 72.

at Parliament level[97], this number being significantly higher than the 85 meetings that were recorded at Commission level[98]. Given the broad scope of the DA, especially during the proposal stages of the Regulation, and its potential to redistribute economic value in the data economy, different types of stakeholders, including large technology firms, industry associations, sector-specific coalitions, and civil society organisations, engaged with EU institutions in an attempt to shape the final text of the Regulation. This lobbying activity also focused on the key definitions of "data", "connected product", and "related service".

The most active sectors in the lobbying for the DA were the technology, automotive, and telecommunications industries, each of which had substantial interests in how key definitions such as "data", "connected product", and "related service" were framed. These sectors were represented both directly, through companies like Google and Amazon and members of ACEA and ETNO, and indirectly via trade associations, professional lobby firms, and policy think tanks. Organisations such as DigitalEurope and BusinessEurope played an especially prominent role in coordinating industry-wide responses.

As a preliminary remark, a major limitation in assessing lobbying influence is the lack of access to meeting discussions, reports or minutes. Without this access, it is impossible to quantify the specific impact of individual companies or lobby groups on the final text of the DA. However, one method to, at least partially, uncover lobbying influence is through an analysis of position papers and white papers published by the main lobbyists for the DA. These documents provide insights into the arguments, priorities, and proposed amendments advocated for, during the legislative process.

DigitalEurope, representing major digital technology providers, raised several concerns regarding the definitional scope of the DA, particularly with respect to the terms "data", "connected product", and "related service". On the definition of "data", they advocated for a clear limitation to raw data, recommending that any sharing of pre-processed or derived data should require compensation due to its high economic value and potential IP implications.[99] Regarding "connected products", they cautioned that the inclusion of a wider array of devices, including general-purpose hardware and proprietary manufacturer content, introduced legal uncertainty and would not incite innovation and create value from the data. They further called for a definition restricted to products whose primary function is not storing or transmitting data.[100] On "related services", they welcomed the exclusion of electronic communications services but recommended a narrower scope, limited only to services essential to the product's functioning, and stressed that services primarily used to display or protect content should be excluded from the definition.[101] It is relevant to note that, as shown in the transparency register, DigitalEurope did have a meeting with the EC on the topic of the DA, so it is likely that its views had at least some impact on the final definitions used.

BusinessEurope, one of the main cross-sectoral business lobby groups in the EU, expressed concern over the breadth and ambiguity of the definitions. On the definition of "data", the organisation warned that the inclusion of both personal and non-personal data, as well as raw and inferred data, could create legal difficulties and an overlap of legal obligations, especially in the context of mixed data sets.[102] It recommended that the clarification found in Recital 17, limiting the scope to raw data in the form and format in which it is generated, be incorporated into the main definition.[103] Regarding "connected product" and "related service", it pointed out uncertainties about whether the definition refers to the entire product or to its components, such as sensors. Additionally, it raised an issue about the definition being confined only to physical products, as this would give software or service providers an indirect advantage.[104] BusinessEurope

97. 'EU Integrity Watch: Monitor Potential Conflicts of Interests' https://integritywatch.eu/mepmeetings.php?previousmandate=1&legislature=9 accessed 30 April 2025.
98. EU Integrity Watch (n 97)
99. DigitalEurope, 'Safeguarding Europe's Economic Competitiveness in the Data Act's Final Stretch', 11-13 https://www.digitaleurope.org/resources/safeguarding-europes-economic-competitiveness-in-the-data-acts-final-stretch/ accessed 30 April 2025.
100. Digital Europe (n 99) 14.
101. Digital Europe (n 99) 15.
102. BusinessEurope, 'The Proposal for a Data Act - a BusinessEurope Position Paper', 3 https://www.businesseurope.eu/publications/the-proposal-for-a-data-act-a-businesseurope-position-paper/ accessed 30 April 2025.
103. BusinessEurope (n 102).
104. BusinessEurope (n 102) 4.

also had meetings with EU institutions on the DA, at least at the Commission level, so it is likely that their views were also considered when solidifying the final versions of the definitions.

The automotive industry, represented by key stakeholders such as the European Automobile Manufacturers' Association (ACEA) and the European Association of Automotive Suppliers (CLEPA), actively lobbied during the legislative process of the DA to influence the definitions of "data", "connected product", and "related service". Their primary concern was to ensure that the complexities of the deployment of data-based services in the automotive sector were adequately reflected in the legislation.[105]

ACEA emphasised the need for clarity in the definition of "data", advocating for a distinction between raw data and data that has been processed or derived, because disclosing derived or inferred data can have a negative impact on the competitiveness of European digital innovators.[106] Additionally, ACEA highlighted the importance of defining "connected products" and the "data" that needs to be made available by the manufacturer in a manner that considers the complexity of modern vehicles and the modifications that would need to be made to the vehicles in order for their obligations under the DA to be fulfilled.[107] CLEPA echoed these concerns and advocated for the need of an automobile-specific regulation to complement the horizontal framework of the DA.[108] The overall view of the sector is that at least the proposed key definitions of "data", "connected product" and "related services" were too broad to take into account the unique challenges of the automobile sector. Key lobbyists insist on the introduction of a more sector-specific regulation that facilitates effective, sector-specific access to in-vehicle data, which would complement the DA, as is also highlighted by FIGIEFA, the most active lobbyist at the Commission level, as reported by Integrity Watch EU.[109]

In summary, lobbying around the DA was both intense and highly sector-driven, with the technology, automotive, and telecommunications industries playing key roles in shaping its final provisions. These stakeholders concentrated their efforts on influencing the definitions of "data", "connected product", and "related service", as these determine the scope of data access and sharing obligations. While DigitalEurope and BusinessEurope sought to narrow definitions to protect proprietary interests and limit regulatory burdens, the automotive sector, led by ACEA, CLEPA, and FIGIEFA, highlighted the complexity of vehicle-generated data and called for sector-specific rules. Although the exact impact of these efforts cannot be fully traced, their positions are reflected in the final compromises adopted by the co-legislators, indicating that lobbying significantly influenced the framing of these key definitions.

5. Discussion & Conclusion

The European Strategy for Data, as previously discussed, aims at creating a single European market for data in order to strengthen the EU's global competitiveness and digital sovereignty. One of its aims is adopting legislative measures on data governance, access and reuse, increasing the data that becomes available for use in the economy, whilst ensuring that individuals and businesses are in control of the data that they generate.[110] As established before, the DA is one of the key regulations, together with the DGA, that has been implemented in order to further and fulfil these goals.[111] In this context, the definitions of "data", "connected

105. CLEPA, 'Data Act Is Important but Has to Be Complemented Soon by Sector-Specific Legislation on Access to in-Vehicle Data, Functions and Resources' (*CLEPA*, 8 November 2022) https://www.clepa.eu/insights-updates/news/data-act-must-be-promptly-complemented-by-a-sector-specific-legislation-on-access-to-in-vehicle-data-functions-and-resources/ accessed 1 May 2025.
106. ACEA, 'Latest Compromise on EU Data Act Poses Threat to Auto Industry Competitiveness' (*ACEA*, 21 June 2023) https://www.acea.auto/news/latest-compromise-on-eu-data-act-poses-threat-to-auto-industry-competitiveness/ accessed 1 May 2025.
107. ACEA, 'Position Paper - Proposal for a Data Act' (*ACEA*, 16 May 2022), 4-6 https://www.acea.auto/publication/position-paper-proposal-for-a-data-act/ accessed 1 May 2025.
108. CLEPA, 'Data Act Is Important but Has to Be Complemented Soon by Sector-Specific Legislation on Access to in-Vehicle Data, Functions and Resources' (n 105).
109. FIGIEFA, 'Data Act: European Mobility Still Needs Sector-Specific Rules' (*FIGIEFA*, 18 July 2023) https://www.figiefa.eu/en/2023/data_act_european_mobility_still_needs_sector-speci_c_rules.html accessed 1 May 2025.
110. Commission, 'A European Strategy for Data' (*Shaping Europe's Digital Future*, 9 April 2025) https://digital-strategy.ec.europa.eu/en/policies/strategy-data accessed 29 April 2025.
111. Commission, 'Data Act Explained' (n 25).

product", and "related service" have a crucial impact on the DA's scope, and therefore its ability to implement the Strategy's goals.

"Data" under Art. 2(1) DA, through the formulation of "any digital representation of acts, facts or information", adopts a deliberately broad definition, encompassing both personal and non-personal data. This broadness supports the Strategy's first pillar, which underlines the need for cross-sectoral governance of data access and use.[112] By avoiding a narrow or technology-specific concept of data, the DA ensures that its data access obligations can meet its objectives of applying horizontally across sectors,[113] thus facilitating the innovative re-use of data in both economic and societal domains, as set forth by the Strategy. Additionally, by aligning the DA's definition of "personal data" with the GDPR and introducing targeted data categories used across the Strategy's instruments, the Act helps establish regulatory coherence, which is an essential element of enabling the creation of common European data spaces, enshrined in Pillar IV of the Strategy.[114] However, this alignment also introduces an additional layer of broadness to the scope of the DA, as it has been argued by academics that the definition of "personal data" in the GDPR sets a very low bar, as it includes every datum that identifies a person or could identify a person in the future.[115] Although the DA introduces further delineation through terms like "product data" and "related service data", these clarifications are embedded within functional provisions, and they are broad definitions themselves. The DA's scope is ultimately narrowed by its specific application to data generated by connected products, excluding general data environments not tied to such devices.[116] However, the broadness of the definition for "data" remains, and it is likely to have negative impacts on the application and efficiency of the DA, which will be further expanded on below.

The definitions of "connected product" and "related services" in Arts. 2(5) and (6) DA are also in line with the objectives of the Strategy, as they functionally link the obligations in the DA to the technical features of IoT devices, rather than to particular industries or use cases. By focusing on whether a product obtains, generates, or collects data about its use or environment and is capable of communicating that data, the definition of "connected product" enables the DA to apply across diverse sectors, from industrial products to consumer products, thus promoting the cross-sectoral data availability and interoperability sought by the Strategy.[117] By employing a broad definition of items that fall under "connected product", the DA aligns its scope with the Strategy's aim of users of such products.[118] However, the legal uncertainty caused by this breadth has been flagged in sectoral contexts, such as by the automotive industry, where stakeholders demanded more tailored regulations.[119] Even though Recital 15 attempts to provide some clarity by excluding inferred and derived data from the scope of the Regulation, the overall definition remains broad.

Having a broad definition of "connected product", taken together with the broad definition of "data", the material scope of the DA might to expand even further due to its application to an exponentially growing range of situations, as has been theorised in the context of the "personal data" definition of the GDPR.[120] Additionally, due to the fact that the definition is all-encompassing and has the aim of being a horizontal, cross-sectoral Regulation, the applicability of the DA can be cumbersome for manufacturers, as has been pointed out by the automobile industry. [121] Ultimately, different sectors have different needs and particularities about their products that must be kept in mind, and having an overarching, horizontal regulation, can lead

112. European Data Strategy (n 2) 12.
113. DA Proposal (n 5) 1.
114. European Data Strategy (n 2) 21.
115. Chris Jay Hoofnagle, Bart van der Sloot, and Frederik Zuiderveen Borgesius, 'The European Union General Data Protection Regulation: What It Is and What It Means' (2019) 28 Information & Communications Technology Law 65, 72.
116. 'Decoding the EU Data Act: Data Types Covered by Data Access and Sharing Rights' https://www.hoganlovells.com/en/publications/decoding-the-eu-data-act-data-types-covered-by-data-access-and-sharing-rights accessed 29 April 2025.
117. European Data Strategy (n 2) 6-8.
118. 'The EU Data Act Explained: Rights, Obligations and Challenges for Data Holders and Manufacturers' (26 June 2024) https://diconium.com/en/blog/eu-data-act accessed 29 April 2025.
119. 'Data Act: European Mobility Still Needs Sector-Specific Rules' (n 109).
120. Nadezhda Purtova, 'The Law of Everything. Broad Concept of Personal Data and Future of EU Data Protection Law' (2018) 10 Law, Innovation and Technology 40, 41.
121. ACEA, 'Position Paper - Proposal for a Data Act' (n 107).

to decreases in its efficiency. Additionally, legal uncertainty remains, especially regarding borderline cases, particularly with emerging technologies, as those can place manufacturers in a position of uncertainty as to whether their product will fall within the definition of a "connected product" or not. This reflects a broader trade-off: maintaining technological neutrality and adaptability may come at the expense of legal certainty, at least in the short term.

Broad definitions have several key impacts, and these can be applied in the case of the DA as well. Which increase legal uncertainty, create implementation challenges, and they increase compliance costs. Especially in the early stages of DA's application, stakeholders may face uncertainty due to missing or differing understandings of the key definitions. Many questions about the breadth of these definitions remain unanswered, as the European Commission itself has acknowledged this ambiguity, noting that practice and court rulings will be needed to clarify the definitions introduced in the DA.[122]

Further, a well-known example where the broadness of definitions led to increased compliance costs, is illustrated by the GDPR's broad definition for "personal data". Such definitions give rise to interpretive uncertainties, requiring regulated entities to exercise considerable judgement when designing and implementing appropriate compliance strategies.[123] In practice, future sector-specific EU and national regulations, guidance issued by competent authorities, and the design choices of manufacturers and service providers will serve to interpret the broad definitions introduced by the DA, thus determining which data should be accessible from a connected product or a related service more clearly.[124] Developments will likely occur within the framework of common European data spaces, which are sector-specific initiatives designed to overcome legal and technical barriers to data sharing. By facilitating coordination among stakeholders, these data spaces are likely to help align interpretations, improve interoperability, and enhance the availability and quality of shared data.[125]

A further indication that the DA should be understood as part of an evolving regulatory framework is the European Commission's recent Digital Omnibus initiative, which seeks to simplify and streamline the Union's increasingly complex digital rulebook. The proposal introduces targeted amendments to several digital legislative instruments with the aim of reducing regulatory fragmentation, improving legal clarity, and lowering compliance costs for businesses operating within the EU digital economy.[126] Whether these promises will materialise, or just raise legal uncertainty in the short run, is still to be seen. In particular, the initiative aims to consolidate instruments found in the DGA, the Open Data Directive, and the Free Flow of Non-Personal Data Regulation into the framework of the DA, thereby positioning the latter as the central legislative instrument governing the circulation, sharing, and reuse of data within the Union.[127] While the current Digital Omnibus proposals do not directly amend the key definitions of "data", "connected product", or "related service" contained in the DA, their objective of consolidating and rationalising the EU data regulatory framework suggests that the scope and operation of these concepts may continue to evolve through future legislative adjustments and interpretative guidance.

While this article has traced how the definitional scope of the DA evolved during the legislative process, it is important to recognise that definitional breadth does not automatically translate into regulatory reach. This is because the DA's horizontal framework for compulsory data sharing is in practice much narrower than it first appears, applying primarily to B2B contexts and leaving B2G, B2U, and many sectoral regimes outside its scope.[128] This reinforces the view that the DA is less a definitive settlement than a transitional step in

122. Commission, 'Frequently Asked Questions – Data Act' (n 48) 9.
123. Regina Becker and others, 'Purpose Definition as a Crucial Step for Determining the Legal Basis under the GDPR: Implications for Scientific Research' (2024) 11 Journal of Law and the Biosciences 1.
124. Recital 14 and 20 Data Act (n 4).
125. European Data Strategy (n 2) 16-17.
126. Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Regulations (EU) 2016/679, (EU) 2018/1724, (EU) 2018/1725, (EU) 2023/2854 and Directives 2002/58/EC, (EU) 2022/2555 and (EU) 2022/2557 as regards the simplification of the digital legislative framework, and repealing Regulations (EU) 2018/1807, (EU) 2019/1150, (EU) 2022/868, and Directive (EU) 2019/1024 (Digital Omnibus) COM/2025/837 final, 1-3.
127. Digital Omnibus 4-5.
128. Tombal and Graef (n 10) 136-138.

the EU's digital policy trajectory.[129] Overall, it can be said that the DA is best understood as an evolutionary stage: broad horizontal definitions and frameworks establish a baseline, but their ambiguities and limits necessitate continuous sector-specific adjustments, addressing the nuances that horizontal legislation cannot easily address.

Annex 1 - Timeline (in-depth)

21/01/2022 → SEC/2022/81 ⇒ REGULATORY SCRUTINY BOARD OPINION (Data Act)

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=PI_COM:SEC(2022)81
- relevant EU body: Commission

23/02/2022 → SWD/2022/35/FINAL ⇒ COMMISSION STAFF WORKING DOCUMENT → EXECUTIVE SUMMARY OF THE IMPACT ASSESSMENT REPORT (accompanying the document)

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD:2022:0035:FIN
- relevant EU body: Commission

23/02/2022 → SWD/2022/34/FINAL ⇒ COMMISSION STAFF WORKING DOCUMENT → IMPACT ASSESSMENT REPORT (accompanying the document)

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD%3A2022%3A0034%3AFIN
- relevant EU body: Commission

23/02/2022 → COM/2022/68 final ⇒ Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on harmonised rules on fair access to and use of data (Data Act)

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A0068%3AFIN
- relevant EU body: **Commission**

24/02/2022 → adoption by Commission

25/02/2022 → discussion within the Council or its preparatory bodies → additional texts approved for regulation

- ST 6596 2022 ADD 1 (impact assessment report) is found final →https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_6596_2022_ADD_1
- ST 6596 2022 ADD 2 (summary of impact assessment report) is found final →https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_6596_2022_ADD_2
- ST 6596 2022 ADD 3 (regulatory scrutiny board opinion) is found final →https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_6596_2022_ADD_3
- ST 6596 2022 INIT (proposal for the regulation) is found final →https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_6596_2022_INIT
- relevant EU body: Council of the EU

12/05/2022 → discussion within the Council or its preparatory bodies → Opinion on the application of the Principles of Subsidiarity and Proportionality (for proposal of Data Act)

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_9049_2022_INIT
- relevant EU body: Council of the EU

24/05/2022 → discussion within the Council or its preparatory bodies → Opinion on the application of the Principles of Subsidiarity and Proportionality (for proposal of Data Act)

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_9056_2022_INIT
- relevant EU body: Council of the EU

15/06/2022 → Opinion of the European Economic and Social Committee on 'Proposal for a Regulation of the European Parliament and of the Council on harmonised rules on fair access to and use of data (Data Act)'

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=eesc:EESC-2022-00850
- relevant EU body: Economic and Social Committee

15/06/2022 → discussion within the Council or its preparatory bodies → Opinion on the application of the Principles of Subsidiarity and Proportionality (for proposal of Data Act)

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_10302_2022_INIT
- relevant EU body: Council of the EU

30/06/2022 → Opinion of the European Committee of the Regions — European Data Act

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52022IR1959
- relevant EU body: European Committee of the Regions

129. Tombal and Graef (n 10) 159.

05/09/2022 → Opinion of the European Central Bank of 5 september 2022 on a proposal for a regulation on harmonised rules on fair access to and use of data (Data Act)

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52022AB0030
- relevant EU body: European Central Bank

14/09/2022 → Committee draft report

- link:https://www.europarl.europa.eu/doceo/document/ITRE-PR-732704_EN.pdf
- relevant EU body: European Parliament

14/11/2022 → Amendments tabled in Committee

- links:
  - https://www.europarl.europa.eu/doceo/document/ITRE-AM-738509_EN.pdf
  - https://www.europarl.europa.eu/doceo/document/ITRE-AM-738511_EN.pdf
  - https://www.europarl.europa.eu/doceo/document/ITRE-AM-738548_EN.pdf
  - https://www.europarl.europa.eu/doceo/document/ITRE-AM-738549_EN.pdf
- relevant EU body: European Parliament

25/01/2023 → Committee opinion → Committee on the Internal Market and Consumer Protection and Committee on Industry, Research and Energy

- link:https://www.europarl.europa.eu/doceo/document/IMCO-AD-736701_EN.pdf
- relevant EU body: European Parliament

26/01/2023 → Committee opinion → Committee on Legal Affairs and Committee on Industry, Research and Energy

- link:https://www.europarl.europa.eu/doceo/document/JURI-AD-736696_EN.pdf
- relevant EU body: European Parliament

02/02/2023 → Committee opinion → Committee on Civil Liberties, Justice and Home Affairs and Committee on Industry, Research and Energy

- link:https://www.europarl.europa.eu/doceo/document/LIBE-AD-737389_EN.pdf
- relevant EU body: European Parliament

25/02/2023 → Regulatory Scrutiny Board Opinion

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_6596_2022_ADD_3&qid=1740310419332

28/02/2023 → Committee report tabled for plenary, 1st reading/single reading

- link:https://www.europarl.europa.eu/doceo/document/A-9-2023-0031_EN.html
- relevant EU body: **European Parliament**

14/03/2023 → Text adopted by Parliament, partial vote at 1st reading/single reading

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:C_202300419
- relevant EU body: **European Parliament**

14/07/2023 → Text agreed during interinstitutional negotiations

- link:https://www.europarl.europa.eu/RegData/commissions/itre/inag/2023/07-14/ITRE_AG(2023)751822_EN.pdf
- relevant EU body: European Parliament

19/07/2023 → Approval in committee of the text agreed at 1st reading interinstitutional negotiations

- links:
  - https://www.europarl.europa.eu/RegData/commissions/itre/inag/2023/07-14/ITRE_AG(2023)751822_EN.pdf
  - https://www.europarl.europa.eu/RegData/commissions/itre/lcag/2023/07-14/ITRE_LA(2023)004595_EN.pdf

09/11/2023 → Text adopted by Parliament, 1st reading/single reading

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:C_202402847
- relevant EU body: **European Parliament**

10/11/2023 → discussion within the Council or its preparatory bodies→ outcome of the European Parliament's first reading

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_15213_2023_INIT
- relevant EU body: Council of the EU

15/11/2023 → discussion within the Council or its preparatory bodies→ REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on harmonised rules on fair access to and use of data and amending Regulation (EU) 2017/2394 and Directive (EU) 2020/1828 (Data Act)

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:PE_49_2023_INIT
- relevant EU body: Council of the EU

17/11/2023 → discussion within the Council or its preparatory bodies → adoption of the legislative act

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_15447_2023_INIT

- relevant EU body: Council of the EU

27/11/2023 → approval of the EP's first reading position by the Council (adoption of legislative act) → voting result

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:ST_16059_2023_INIT
- relevant EU body: Council of the EU

13/12/2023 → signature by the President of the EP and the President of the Council14/12/2023 → discussion within the Council or its preparatory bodies → REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL ON HARMONISED RULES ON FAIR ACCESS TO AND USE OF DATA AND AMENDING REGULATION (EU) 2017/2394 AND DIRECTIVE (EU) 2020/1828 (DATA ACT)

- link:https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CONSIL:PE_49_2023_REV_1
- relevant EU body: Council of the EU

22/12/2023 → date of publication31/01/2024 → Commission response to text adopted in plenary

- link:https://data.europarl.europa.eu/distribution/doc/SP-2023-632-TA-9-2023-0069_en.docx
- relevant EU body: Commission