



VTT Technical Research Centre of Finland

## Guidebook: Data Ecosystems for Smart Sustainable Cities

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The background of the slide is a complex, abstract geometric pattern. It features a central vertical orange bar with several small orange triangles pointing upwards and downwards from it. The rest of the background is composed of various shades of green and black triangles of different sizes, creating a faceted, crystalline appearance. The overall color palette is dominated by greens and oranges.

## **Guidebook:** **Data Ecosystems for Sustainable Smart Cities**

# You will find this in the Guidebook

## Summary

Introduction, key takeaways, call to action

## Build your vision

Smart sustainable cities boosted by data sharing

## Develop your capabilities

Capabilities needed in data ecosystems

## Find tools and examples

Where to find help for building data ecosystems?



### Introduction - Data Ecosystems for Sustainable Smart Cities

This guidebook is dedicated to the development of data ecosystems and the promotion of data sharing to advance *smart city* initiatives. It outlines the essential elements and phases involved in this process, such as

- building a clear *vision*,
- developing the necessary *capabilities* for forming, growing, and operating data ecosystems,
- adopting *regulatory frameworks*, and
- fostering collaborative *innovation*.

Our objective is to offer *guidelines*, share valuable *insights*, and present practical *examples* to assist all stakeholders within a smart city context who are engaged in building data ecosystems and enhancing data sharing practices.

We hope that you find this guidebook both inspiring and useful on your journey to unlock the full potential of data to drive innovation, sustainability, and improved urban living.

This guidebook was compiled as a part of the two-year co-innovation project called Data Markets for Sustainable Cities (DataMust). The project was funded by Business Finland and the participating organizations:



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**Note:** You can navigate through the Guidebook using the interactive links on the top of the page.

Further reading:  
[Data Markets for Sustainable Cities](#)



Funded by the European Union –  
NextGenerationEU

## Summary

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Develop your capabilities

Find tools and examples

1. Introduction

2. **Key takeaways** (1/7)

3. Call to action

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# 1 Sustainability and Urban Resilience

Smart cities aim to address challenges like climate change, energy transition, and the rise of AI solutions.

Data and data platforms play a significant role in enabling co-creation of smart services that contribute to sustainability and urban resilience.

However, the smart city development needs to be driven by the digital services with explicit value propositions.

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# 2 Integration of Smart City Systems

Smart city forms a sociotechnical system that integrates physical infrastructure with technology, citizens, social structures, and governance. This integration is crucial for creating smart digital services that rely on data from the urban environment. Cities can play a pivotal role as keystone organizations in data ecosystems by facilitating data sharing, providing infrastructure, and ensuring trust and governance.

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# 3

## Importance of Data Ecosystems

Data ecosystems go beyond technical platforms. They enable collaborative value creation, development of data-related practices, adoption of standards and regulations, and innovation in business models and services.

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# 4 Dynamic Capabilities for Data Ecosystems

Forming, growing, and operating data ecosystems require various skillsets, investments, and technologies. Active business and innovation networks, like those in Finland, are crucial for the success of data ecosystems. Emphasis should be put on ensuring that the data ecosystem is sustainable, scalable, and capable of supporting a wide range of data-based innovations in long-term.



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# 5

## Structured Approach to Value Co-creation

Division of value co-creation opportunities into four layers (ecosystem, value, data, and matchmaking layers) provides a structured approach to data sharing, value creation, and ecosystem governance. This structured approach supports the development of digital services and data ecosystems by ensuring that each layer addresses specific aspects of the data sharing process, from establishing connections to creating value and managing the ecosystem.

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# 6 Data Governance and Trust

Data governance is essential due to the complex and sometimes contradictory rights related to data. Establishing clear guidelines and agreements early on helps manage risks associated with data sharing. This creates a trustworthy environment where partners feel confident in sharing their data. The Data Governance Act aims to increase trust in voluntary data sharing, while the Data Act seeks to boost innovation by removing barriers to data access. There are several new roles and mechanisms in the novel European regulations (e.g., neutrality and separation requirements) which opens new opportunities especially for the SMEs.

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# 7 Data Marketplaces

Current data marketplaces are predominantly domain-specific, with public data sources leading. Essentially, they function as data catalogs with data space interfaces, potentially offering additional services. They can also provide Data Spaces as-a-service and be integrated into data space governance.

***Call to action for companies and cities: Monitor the development of the European data economy and data sharing solutions, identify new opportunities and take proactive action.***

***Cities to foster data ecosystems:***

Cities can support birth and growth of data ecosystems by initially developing ecosystemic capabilities within their own organization. Cities should actively promote horizontal collaboration among stakeholders at a strategic level. This involves engaging various stakeholders, including citizens, private companies, and other public authorities, in the value co-creation process. Cities can act as knowledge brokers, facilitating dialogue and ensuring that all relevant actors have an equal opportunity to participate in the ecosystem.

***Develop a vision and accelerate with data ecosystems:***

Promote collaborative value creation around data, develop data-related practices, adopt standards and regulations, and innovate in business models and service. Actors who have large amounts of data for the urban data ecosystem, like building owners, are critical stakeholders for the ecosystem.

***Take advantage of regulatory enablers:***

Data regulations provide a framework for data sharing and access, which can help SMEs develop new data-driven services and products. By understanding and complying with these regulations, SMEs can gain a competitive edge in the data economy.

***Utilize available tools and frameworks:***

Organizations should adopt common tools and frameworks for developing data ecosystems. This includes familiarizing with existing standards and frameworks and preparing for the implementation of common European data spaces. By using commonly agreed standards and tools, all parties can ensure fairness and trust within the data ecosystem and facilitate the integration of resources among different actors.

See full list of actions under the title “Develop your capabilities”.

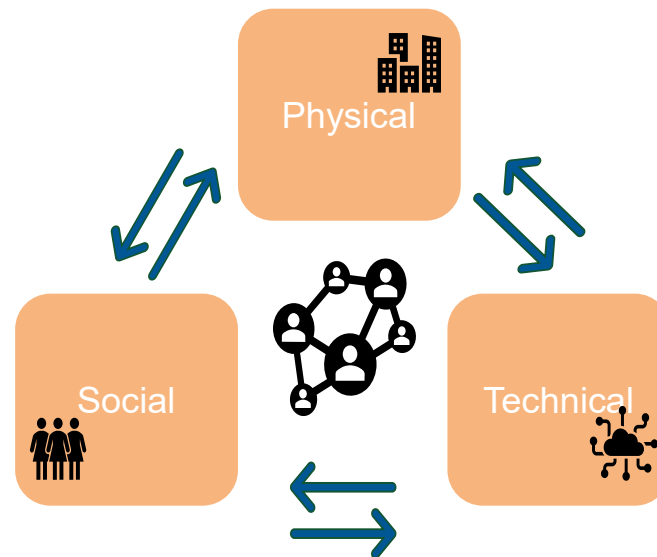
1. Smart sustainable city (1/1)
2. Data ecosystems in smart cities
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### ***Smart sustainable cities combine the physical, technical and social.***

The smart city forms a *sociotechnical system of systems*. It integrates not only the physical city infrastructure with the technology, but brings along also citizens, their social structures, as well as the governance structures of a city.

New smart city services require integrating the data from various cyber-physical systems of the city and utilizing it for new beneficiaries and actors. Realizing value from the new solutions requires *co-creation* and collaborative efforts.

Via data *ecosystems*, cities can boost this development.



1. Smart sustainable city
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### *What do the data ecosystems mean for smart cities?*

Data ecosystems have much more dimensions than mere technical data platforms. A data ecosystem enables *collaborative value creation* around data, development of *data-related practices*, collaborative adoption of *data-related standards and regulations* as well as development of *new business models and service innovations*.

Data ecosystems are also more than just sharing open data. In data ecosystems, data can be shared or brokered with various levels of rules and business models, depending on the needed level of openness of the use case. In data ecosystems, the ecosystem needs to *create pull* for new data. In turn, active *knowledge sharing* and proper *tools create push* for sharing and discussion about new data reserves and collaborative use cases.

Data ecosystems require *strategic insight* and a connection to the *organizational* as well as *city-level development strategies*. Data ecosystems can further enable cities to involve relevant collaborators, such as companies, research institutes, or other public sector entities, to support the regional strategic goals in service creation.

Overall, data ecosystems can *give context* to data-related collaboration and *support regional goals* of creating smarter city and citizen services. Shared data and use cases around it enable discussion about topics like regulative frameworks and practices in *shared language*. Such collaboration and joint value creation can make a significant difference in effective *adoption of new technologies*, such as AI-utilizing new services.

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3. **Smart infrastructure and data** (1/1)
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### *Flipping the approach to financing – New digital services should act as business cases for smart infrastructure.*

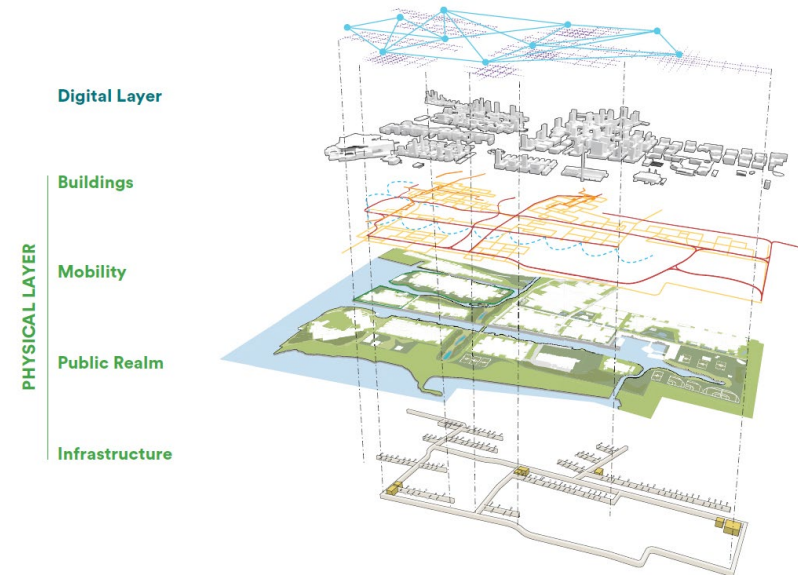
Smart infrastructure produces the data about the urban environment. The smart digital services are created in the *digital layer*, where data is made accessible for different stakeholders.

The digital layer also needs *digital infrastructure*, such as connectivity, digital platforms and data ecosystems. These enable the value co-creation opportunities for new *digital services*.

In contrast to the existing approach on financing infrastructure first, and data second, we propose *flipping the approach*. The new digital services could act as business cases so that they are the value creating opportunity which gets funded, and the smart infrastructure comes along with it as an enabler.

Further reading:

[Vihreä siirtymä vaatii miljardi-investointeja – Siinä itää mahdollisuus pienelle maalle](#)  
[Environmental Engineering for the 21st Century: Addressing Grand Challenges](#)



*A vision for Quayside, a mixed-use urban development in Toronto*

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4. **Regulatory landscape for data** (1/2)
5. European data market and data spaces

### *European data regulation is in dynamic change.*

From the regulatory perspective, the concurrent European data regulation landscape is in a dynamic development stage. There are several important horizontal data regulations in different stages of implementation. The work commenced with the *European Strategy for Data*. It lays down the core aim for Europe to become a leader in data-driven society by creating a single market for data. Based on the European Strategy for Data, two core horizontal regulatory actions were taken, namely drafting of the *Data Governance Act (DGA)* and the *Data Act (DA)*. The DGA aims to create a structural framework for the data economy actors, whereas the DA aims to increase access to data in a more specific manner, e.g., by regulating data generated by the use of a connected products. In addition to the DGA and DA, the European data strategy touches also areas of consumer protection and competition law with regulations like the *Digital Markets Act (DMA)* and the *Digital Services Act (DSA)*. Both regulations aim to address the imbalances in the

European data economy relating existing large digital platforms and creating a level playing field for data economy actors. The DMA regulates the gatekeepers and the DSA very large online platforms and search engines. Together with the *Artificial Intelligence Act (AI Act)*, the DGA, DA, DMA and DSA form the so-called Big five regulations of the future European data economy. However, there is additionally one central regulation that affects the implementation of the Big five regulations, namely the *General Data Protection Regulation (GDPR)*. The GDPR, covering processing of personal data, has been applied already for quite some time and is deeply interlinked with all of the Big five regulations.

Further reading: [European Strategy for Data](#)  
[Data Governance Act](#)  
[Data Act](#)  
[Digital Markets Act](#)  
[Digital Services Act](#)  
[AI Act](#)  
[General Data Protection Regulation](#)



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### **Data Governance Act (DGA) key takeaways:**

*Data cannot be owned. Instead, there may be several, differing and even contradictory rights relating to data. In such cases, data governance becomes important. Aim of the DGA is to increase trust in voluntary data sharing.*

- **Reuse of certain public sector data:** Mechanisms to facilitate the reuse of certain public sector data that cannot be made available as open data, for example health data.
- **Data Intermediaries:** Alternative to current big tech platforms, for example neutral data marketplaces, data trusts, product information management, data co-operatives. Prior notification to a EU register is required and stringent obligations apply (for example neutrality, cross-usage prohibition, unbundling, FRAND-terms, interoperability).
- **Data altruism:** Voluntary registration and national register for organizations with general interest and not-for-profit purpose. Obligations include for example transparency, reporting, cross-usage prohibition, consent tools.

### **Data Act (DA) key takeaways:**

*DA aims for a wider range of private and public entities to share data, and thereby to boost innovation. This is done by removing barriers obstructing consumers' and businesses' access to data (who, on which basis, under which conditions).*

- **Usage data of connected products:** Access by design to data generated by a connected product or generated during the provision of related services to data subjects, users or to data recipients designated by those users. Aim to develop interoperability standards and common specifications for such data. Compensation on FRAND terms.
- **Other clauses:**
  - Facilitating switching between data processing services
  - Fair contractual terms for SMEs
  - Business to Government data sharing, international safeguards
  - Protection of personal data

Further reading: [Data Governance Act](#)  
[Data Act](#)

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### ***Europe is aiming for a single market for data.***

The European single market for data is based on the *European strategy for data*. EU aims towards a society where data can flow within the EU, across different sectors and domains, benefitting Europe and Europeans as a whole.

*“Over the last few years, digital technologies have transformed the economy and society, affecting all sectors of activity and the daily lives of all Europeans. Data is at the centre of this transformation and more is to come. Data-driven innovation will bring enormous benefits for citizens, for example through improved personalised medicine, new mobility and through its contribution to the European Green Deal.”*

Such data markets shall respect all European rules, in particular privacy and data protection, as well as competition law. In such data economy, the rules for access and use of data need to be fair, practical and clear.

### ***Stakeholders are actively building European data spaces.***

Common European data spaces play a central role in building the single market in a number of chosen strategic fields. Data space is defined as an *“interoperable framework, based on common governance principles, standards, practices and enabling services, that enables trusted data transactions between participants”*.

A key characteristic of the data spaces is that they are driven by the stakeholders. At this very moment, data providers, data consumers and other users within each distinct sector are contributing to shaping the data spaces. As a result, several different data spaces are being formed with unique characteristics. However, these data spaces are all to be built on common data infrastructures and governance frameworks, facilitating data pooling, access and sharing across sectors.

Further reading: [European Strategy for Data](#)  
[European Commission on Data Strategy](#)  
[Common European Data Spaces](#)  
[Data Spaces Support Centre Glossary](#)

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### Key features of Common European Data Spaces:

#### Common European Data Spaces:

- are *open for the participation* of all organizations and individuals.
- have a *secure and privacy-preserving infrastructure* to pool, access, share, process, and use data.
- are a clear and practical structure for accessing and using data: common European data space have fair, transparent, proportionate and non-discriminatory access rules, due to *well-defined and trustworthy data governance mechanisms*.
- *respect EU rules and values*, especially personal data and consumer protection, and competition law.
- enable data holders to *grant access to or to share* certain personal or non-personal data.
- empower data holders to make their data available for reuse *for free or against compensation*.

### Data space is a new approach to data exchange.

What makes data spaces distinct from other forms of data exchange is its form as a *software-based distributed system* that ensures *data sovereignty*, and the *trustworthiness and security* of data transactions based on comprehensive *common rules and agreements* among the data space participants for data exchange (governance framework).

Comparison of data spaces to other forms of data exchange:

- *Data platforms and data hubs*: Data is transferred to third party, often hosted in Cloud environment, managed by third party software with possible exposure to leaks
- *Data lakes and warehouses*: distributed collections of data bases under a single point of control having the same data control problems as platforms
- *Messaging systems or APIs*: High level of security, but the data management is challenging with typically big overheads regarding configuration and scaling

1. Define needed capabilities (1/1)
2. Take advantage of regulatory enablers
3. Accelerate with data ecosystems
4. Get ready for data spaces

### *Identify needed capabilities based on the challenges and emerging phenomena of smart cities.*

Sustainability and urban resilience are among the challenges that smart cities aim to solve.

Data and data platforms play a significant role in the enabling and facilitating of co-creation of smart services.

Data ecosystems in cities is still an emerging phenomenon. Yet cities are likely to need them to mature and accelerate smart city services.

By building capabilities that support ecosystem facilitation, cities could find ways to:

- Empower growth opportunities of local businesses
- Foster innovation
- Create and improve enablers for new smart city services

*Key capabilities* to focus on:

- Ecosystem resilience
- Adaptive value creation
- Data regulation
- Strategic service creation
- Continuous improvement of established services

Further reading:

[Sustainable and Smart Cities – Governance, Economy and Society \(Khare, Beckman\)](#)

1. Define needed capabilities
2. Take advantage of regulatory enablers (1/2)
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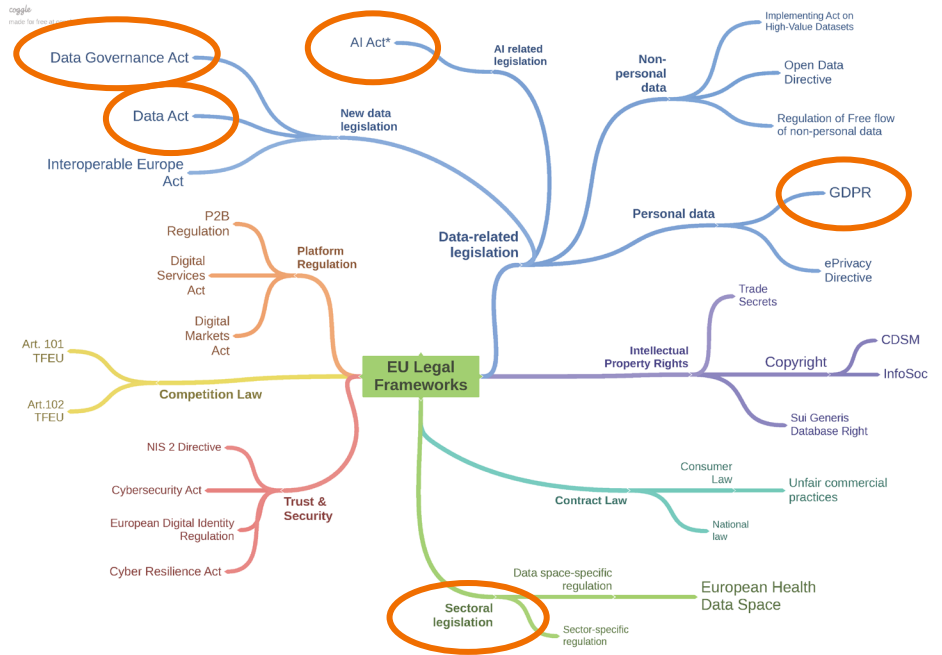
### Scope and prioritize the regulatory landscape to your business needs.

In addition to the core data regulations (DGA, DA, DMA, DSA, AI Act, GDPR), the regulatory landscape covers a wide range of other areas, for example regulation applicable to specific type of data, consumer protection, competition, and IPR.

A company aiming to seize the opportunities embedded in novel regulation, needs to choose the most relevant regulation in terms of *its future business*. On one hand, this requires broadening the view from the immediate operational legislation further to future. On the other hand, it also requires scoping down and prioritizing.

An example of this kind of scoping in the context of data sharing opportunities relating to *energy-efficiency of buildings in smart cities*, could start from the core data regulations, scoping down to aspects of data intermediation services in DGA, user data of the IoT device in DA combined with sectoral regulation and initiatives.

Further reading: [Data Spaces Support Centre Regulatory Compliance](#)



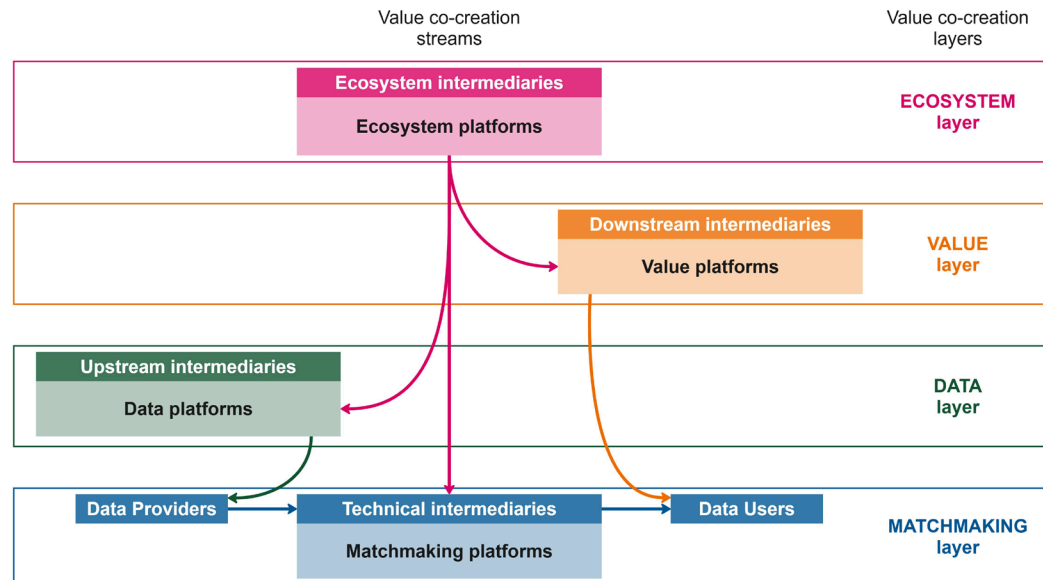
1. Define needed capabilities
2. Take advantage of regulatory enablers (2/2)
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### *Understand the value co-creation layers to seize opportunities stemming from the EU regulations.*

There are several new roles and mechanisms in the novel European regulations (e.g., *neutrality and separation requirements*) which could support especially the SMEs. For business model innovators, new roles as *orchestrators of data sharing actors* and diverse *service provider roles* (upstream or downstream of the data transactions) are worth exploring.

In data-based business, value is often co-created with other participants, meaning that businesses need to open their business models to accept the *co-creation of value*. New value creation opportunities appear especially in the service and ecosystemic value co-creation layers.

Increase of *trust* related to data sharing can increase innovation aspects related to digital platforms.



Further reading:  
[How the European Data Regulation Enables Innovation for Platform Ecosystems? \(Suksi, Pussinen\)](#)

1. Define needed capabilities
2. Take advantage of regulatory enablers
3. **Accelerate with data ecosystems** (1/2)
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### *Choose the focus of your data ecosystem – is it business or innovation?*

Data ecosystems are based on a dynamic set of capabilities; forming, growing and operating the data ecosystems requires various skillsets, investments and technologies.

In Finland, the business and innovation networks are already active in many key areas.

City data ecosystem facilitators have two distinct focus areas: innovation leadership and business leadership.

We have identified some key areas for the innovation leaders and the business leaders of the ecosystems to focus on.

Further reading:

[Exploring data ecosystems in smart city service creation \(Oldenburg, Pussinen 2024\)](#)

*Innovation leaders* focus on improving and supporting the local innovation effort via research, pilot projects etc. The city can provide data, data infrastructure and support funding in order to accelerate the innovation activity.

*Business leaders* focus on improving the local vitality and supporting the creation of new business opportunities. The city can offer data, but also create frameworks, operative models, networks and practices to support new businesses.

***Focus on the key capabilities needed by the business leader and the innovation leader.***

**Business leader**

*Key Goals:*

- Improving the local vitality
- Supporting the creation business opportunities
- Facilitating business activities

*Key Capabilities:*

- Partnership scouting
- Ecosystem forming
- Ecosystem resilience

*Key Responsibilities:*

- Establishing ecosystem goals, collaborative models, processes, and practices.
- Communication and promotion of the ecosystem and the network

**Innovation leader**

*Key Goals:*

- Improving and supporting the local innovation capabilities
- Providing means, platforms and collaborative structures for innovative value co-creation

*Key Capabilities:*

- Opportunity screening & ecosystem forming
- Value proposition development
- Ecosystem resilience
- Adaptive value creation

*Key Responsibilities:*

- Identifying opportunity areas for innovative value creation
- Establishing the foundation of innovative networks to form
- Identifying and organizing funding opportunities



1. Define needed capabilities
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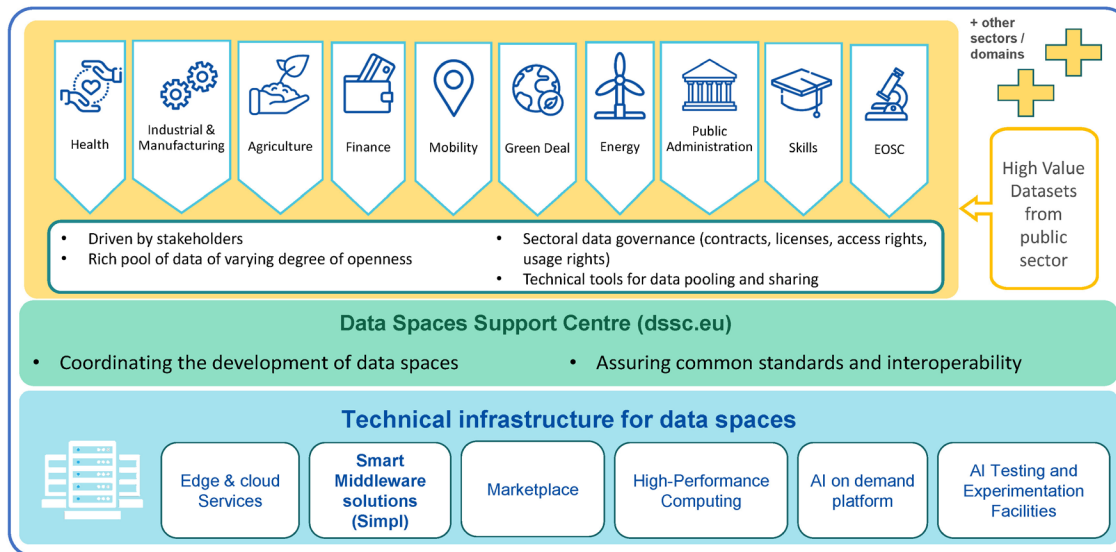
### Take a glance at the Common European Data Spaces that are under active development.

Common European Data Spaces are currently developed across *14 sectors/domains* and new ones are being added.

Common European Data Spaces are based on an underlying *technical infrastructure layer* containing for instance open source software implementations under the Simpl initiative, marketplaces and edge & cloud services.

The *Data Spaces Support Centre (DSSC)* is acting as an connecting layer between the sector specific data spaces and the infrastructure components, coordinating the development of the data spaces and assuring common standards and interoperability.

## Common European data spaces

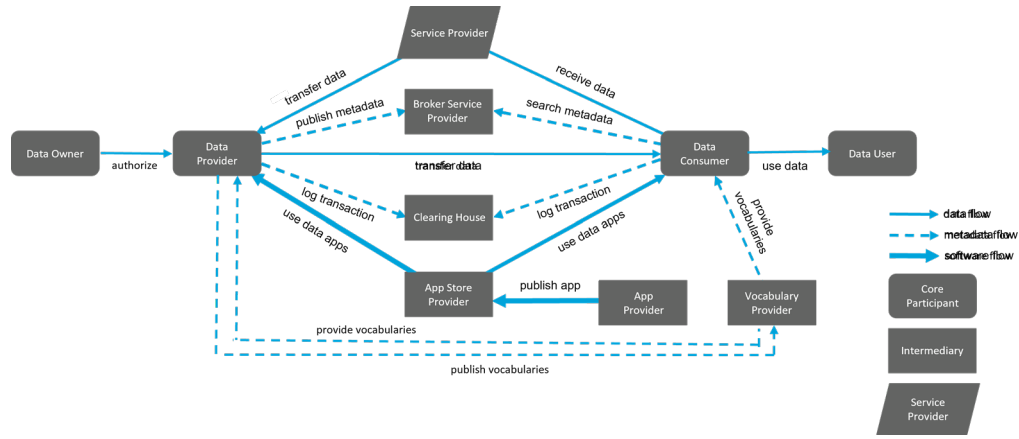


Further reading: [Webinar on data spaces by data.europa academy](#)  
[DSSC guidance and tools](#)

1. Define needed capabilities
2. Take advantage of regulatory enablers
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- 4. Get ready for data spaces (2/3)**

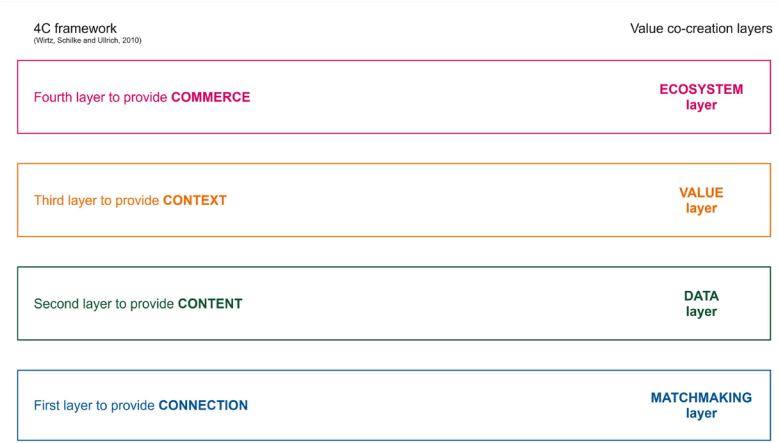
**Investigate the role and structure of marketplaces in data spaces in more detail.**

*Marketplace* is not clearly defined in data spaces. It may refer to infrastructure components or parties. There are *several intermediary roles* involved in a data transaction between the Data Provider and the Data Consumer. *Broker Service* provider acts as the metadatabroker enabling publishing of metadata and search of data. *Clearing House* provides clearing and settlement services for financial and data exchange by logging the data transactions. *App Store Provider* enables the use of data apps. Current data marketplaces are mostly domain specific and public data sources are dominating. In essence, they are data catalogs added with data space interfaces, possibly offering services on top of the catalogue functionality. Additionally, data marketplaces can offer *Data Spaces as-a-service*. Data marketplaces could also be integrated into the governance of a data space.



Further reading: [International Data Spaces Layers of the reference architecture model](#)

### Study possibilities for varying types of data marketplaces on different value co-creation layers.



Data marketplace intermediaries can operate on [all platform layers](#), but for instance the stringent requirements relating to data intermediation services under the Data Governance Act (DGA) apply only in case the services aim to establish commercial relationships between an undetermined number of actors. Only this kind of large-scale data intermediation services

within the scope of the DGA should be placed on the Ecosystem layer.

If a data intermediary has a different scope in terms of their role or position in the data transactions, the services provided should be placed on lower levels of the four value co-creation layers. For example, if a data marketplace covers only matchmaking capabilities between data holders and data users and enables the data transaction to be completed on the platform but does not provide any support for further value creation, the data marketplace would fall under the *Data layer*.

In case a data marketplace includes services for downstream service providers, it could be placed on the *Value layer*. And finally, in case a data marketplace is capable of connecting an undetermined number of actors and orchestrating their interactions, we can place it on the *Ecosystem layer*.

Further reading: [How the European Data Regulation Enables Innovation for Platform Ecosystems? \(Suksi, Pussinen 2024\)](#)



## *Taking data ecosystems to practice – Key questions to address the goals and objectives of your data ecosystem.*

### *Vision*

Where will we be when our ecosystem is running?

- Who are the key beneficiaries?
- Who produces and what in the ecosystem?

### *Mission*

What are our use cases?

- Use cases should be:
  - concrete,
  - approachable (i.e. not too big) and
  - comprehensible (has actors from various organizations, preferably from at least 2 dimensions)

### *Landscape*

Where are we in terms of organization, our network and partners?

- What data is needed
- Where does the needed data come from
- Who provides the data?
- What is the technological infrastructure
- Who provides the technological infrastructure?
- What other solutions are needed?

A useful tool for exploring, building, growing and transforming your ecosystem can be found here:

[Open Innovation Playbook by CLIC Innovation](#)



*Find the use case in the vision: identify and verbalize the value proposition.*

**Case – Regional energy footprint**

A Finnish city has established in their strategy, that the carbon footprint of city owned buildings should be radically improved.

In order to establish a situational picture of their building portfolio and make prioritized decisions, city needs a comprehensive, multi-faceted view of their building data.

The team quickly realizes, that by combining data from various sources, they might be able to produce new services for their own property maintenance as well as users of the city facilities.

The development team decides to start from forming a regional energy footprint, a service that makes the areal energy footprint visible in a map-based, easily understandable user interface.

The use cases of the new data should be *concrete*. The data related to the use case should enable a new service, improve an existing one or produce new insights. Concrete use case helps to identify key actors and the system needed to establish the use case.

A good *value proposition* has a clear target audience (users), well-defined problem and clear, understandable solution.

Ideally, new use cases also have strong *links to existing data or service strategy*.

Tools like *value proposal canvas* help to establish good, easily communicated use cases.

*Analyze business opportunities and required capabilities in a specific context, both for individual organizations and collectively.*

A **methodology for use case development** in the context of data sharing was developed and tested in a research project focusing on methane detection, as a response to the identified challenges in data sharing, namely unclear benefits and lack of inter-organizational trust, transparency and sense of security. The methodology enhances shared understanding of the benefits of data sharing between participating organizations and promotes development of collaborative value creation and innovation activities. It comprises of a participative process with stakeholders and a model with a shared objective and organization-specific tables coupled to that. Several iterative rounds are usually needed in the methodology for refining the use case and analyzing the varying needs and motivations of the stakeholders.

More information about the methodology can be found here: [Innovating data sharing for methane detection \(Proceedings of ISPIM Connects Osaka 2024\)](#)

Carefully refining and describing a data sharing use case and the roles of stakeholders involved in data sharing contributes to forming a *shared understanding* of the objective and the required efforts and potential gaps. The necessity to identify clear opportunities for value creation and data needs relevant for that context, and to provide concrete examples, has been recognized and acted upon in various initiatives.

*Data Sharing Support Centre* offers a building block focusing on *Use Case Development*. That also emphasizes the need to identify a use case orchestrator.

Guidelines and methodologies for describing and refining data-sharing use cases are being developed.

Further reading:  
[Use Case Development - Building Blocks - DSSC](#)  
[Hyvä käytätapaus; RTS Tekoäyn eettinen pelikirja 1.0](#)



*Take a close look at the data that your ecosystem covers.*

**Case – Regional energy footprint**

When starting to gather the data needed for their energy footprint service, the team quickly realizes that they will need much more than data they have in their internal use.

They start to go through their immediate partner network; such as building owners and operators. They also identify numerous open data sources they can utilize and enrich their data.

It quickly becomes obvious though, that data is scattered through dozens of different systems. While most of the systems produce high-quality data to their respective use cases, data is not interoperable and it would be a huge operation to get all the needed data to the city databases.

The team decides to gather their partner network together and start to plan a joint strategy on sharing and collaborating with the data.

Each actor in an prospective data ecosystem will have their own IT-systems and data that is formed and collected for their use cases – it's *rarely directly interoperable* with others.

Understanding the use case and the key problem helps to identify the *key partners* and the *most important data* needed to produce the service.

The nascent data ecosystem will most likely need *co-creation, piloting and testing* the use cases and data in order to find the most functional value proposition.

Tools like *data canvases* help to understand the starting points of the new service and what dimensions of data are already usable.



**Rules lay down a solid framework for the data sharing co-operation.**

**Case – Regional energy footprint**

When working with their partner network, the team comes to a conclusion that by utilizing the existing city data platform, they can establish a good structure to collaborate around data. They could ask key partners to deliver their respective data to the platform, modify and combine the data and form new data sets that could be opened to research institutes and other development teams.

They quickly realize though, that data they are working with can create security risks if not dealt with properly.

The team decides to form a playbook, a set of rules and agreements that all the collaborators agree to in order to get access to data.

Most data is risky in some level. Location data can reveal details about critical infrastructure, personal data is everywhere and combining new data sets can reveal risks that were previously unknown.

Establishing clear guidelines early on, helps with *risk management* and *creates trust* between partners.

Agreements are also needed when divvying the *costs* of the data-related activities.

Questions to be addressed include for instance:

- Who is *responsible* for keeping the data platform up and running?
- How are *new partners* accepted to the ecosystem?
- Who has *access* to what parts of the data?

These and many similar questions should be addressed in some level in early stages of the work.



*There are several tools available for drafting the data sharing rules for your ecosystem.*

### **Rulebook for a Fair Data Economy**

Rulebook for a Fair Data Economy is a toolbox by Sitra offering instructions and templates to facilitate data network building.

It collects differing perspectives to data sharing:

- Business and operations
- Technical
- Security
- Legal
- Ethical

In addition to guidance, it contains practical model agreement templates, control questions and code of conduct templates.

Rulebook is available here:

English: [Rulebook for a fair data economy – Sitra](#)

Finnish: [Reilun datatalouden sääntökirja – Sitra](#)

*Note:* Updated Rulebook for data spaces is expected soon.

### **Other useful tools:**

#### **Data Sharing Canvas**

Data Sharing Canvas by the DoE-DSC is a multiperspective guidance towards cross-domain data sharing at scale.

Data sharing canvas is available here: [data-sharing-canvas.pdf](#)

#### **IDSA Rulebook**

IDSA Rulebook by International Data Spaces Association implements the IDS-Reference Architecture Model in the real world.

IDSA Rulebook is available here: [IDSA Rule Book](#)

#### **DSSC Tools**

DSSC Tools, by the Data Spaces Support Centre, offer building blocks, design principles and methods for implementers of data spaces.

DSSC Tools are available here: [Knowledge-base - Data Spaces Support Centre](#)

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