CoE DSC

DITM Data Space SWOT Analysis

An independent analysis of the perspectives of key stakeholders on the DITM ecosystem

Meet our team

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On behalf of

DITM

The conclusions of this analysis are made by the authors (CoE-DSC) and are based on interviews with key stakeholders of the DITM ecosystem. We thank the interviewees for their time and input.

CoE-DSC investigated how DITM stakeholders view a data space approach in the context of autonomous mobility (CCAM)

Management summary

- This independent SWOT analysis by CoE-DSC examines key stakeholders' perceptions of DITM's intended data space approach in the mobility sector.
- Interviews reveal stakeholders' beliefs and concerns about data sharing in a future data space, which may not reflect factual truths and may not be generalisable to all sector players.*
- Key strengths identified include improved standardization, reuse of (quality) data, and data sovereignty.
- Key weaknesses identified include technical complexity, organisational complexity, and high development- and operational costs.
- Several opportunities to provide value for the sector are identified, including easier cross-border data sharing, unlocking of innovative technologies and service offerings, and easier aggregation of public- and private sector data. For individual data space participants, identified opportunities to create value include reduced dependency on data suppliers, operational efficiency improvements, and enhanced access to quality data.
- DITM must navigate a myriad of threats to ensure adoption of a data space if implemented, such as common misconceptions, technical illiteracy, "data hoarding" sentiments, uncertainty and a lack of trust.

Interview partners

Several* representatives from the Dutch Mobility sector with varying potential roles in a data space were interviewed, such as:

Data providers

- NDW
- TomTom
- Gemeente Helmond

Service Providers/ Data Consumers

- V-tron
- VDL
- TomTom

End users

- CCAM software service provider to Transdev
- Port of Rotterdam

Value case owners

- Gemeente Helmond
- Port of Rotterdam

**The number of interviewees in this analysis is limited. This forms a limitation in terms of generalisability, meaning we are not sure of concerns are relevant for all sector parties.*

Source: CoE-DSC Analysis

Table of contents

DITM aims to create a system architecture for the digital infrastructure to support a CCAM mobility system

DITM

- Digitale Infrastructuur voor Toekomstbestendige Mobiliteit (DITM, translation: Digital infrastructure for future-proof mobility) is a consortium project consisting of 19 partners.
- Its objective is to create a system architecture for a digital infrastructure to enable higher levels of autonomous driving.
- The consortium utilises an integral approach, converging developments from the automotive industry, the ICT industry, traffic management, and mobility innovation.

CCAM

- DITM promotes a Cooperative, Connected, and Automated Mobility (CCAM) system, where autonomous vehicles interact via digital means with each other and their environment.
- This includes the development of critical technologies related to localization, traffic services, digital maps, and charging infrastructure.
- Through CCAM, DITM intends to make mobility safer, more sustainable, and more efficient.

Data space approach

- To facilitate data sharing in the (autonomous) mobility sector, DITM is developing a data space.
- By a data space, we mean the data sharing method through which participants utilise a common infrastructure for trustworthy data sharing, based on commonly agreed principles, eliminating the need of a centralised platform for data sharing.
- This document serves to provide an independent analysis of the perspectives of DITM stakeholders on this approach.

Affiliated parties:

Source: CoE-DSC Analysis

Table of contents

Sector parties view data spaces as a means of data sharing, and determine their willingness to participate on the merits

Main conclusion

- In developing a data space approach for the Dutch mobility sector DITM must keep adoption of the data space among sector parties in mind.
- Overarching perspectives of different sector parties on participation do not vary significantly; All parties seem to view a data space as a means of data sharing rather than a goal in and of itself. If a data space performs well on the parameters of data sharing a party values, this party will be eager to participate in the data space and vice versa. Across the sector parties, the parameters most valued are:
    - Accessibility to (quality) data
    - Control over own data
    - Security of data sharing and the prevention of misuse
    - Costs

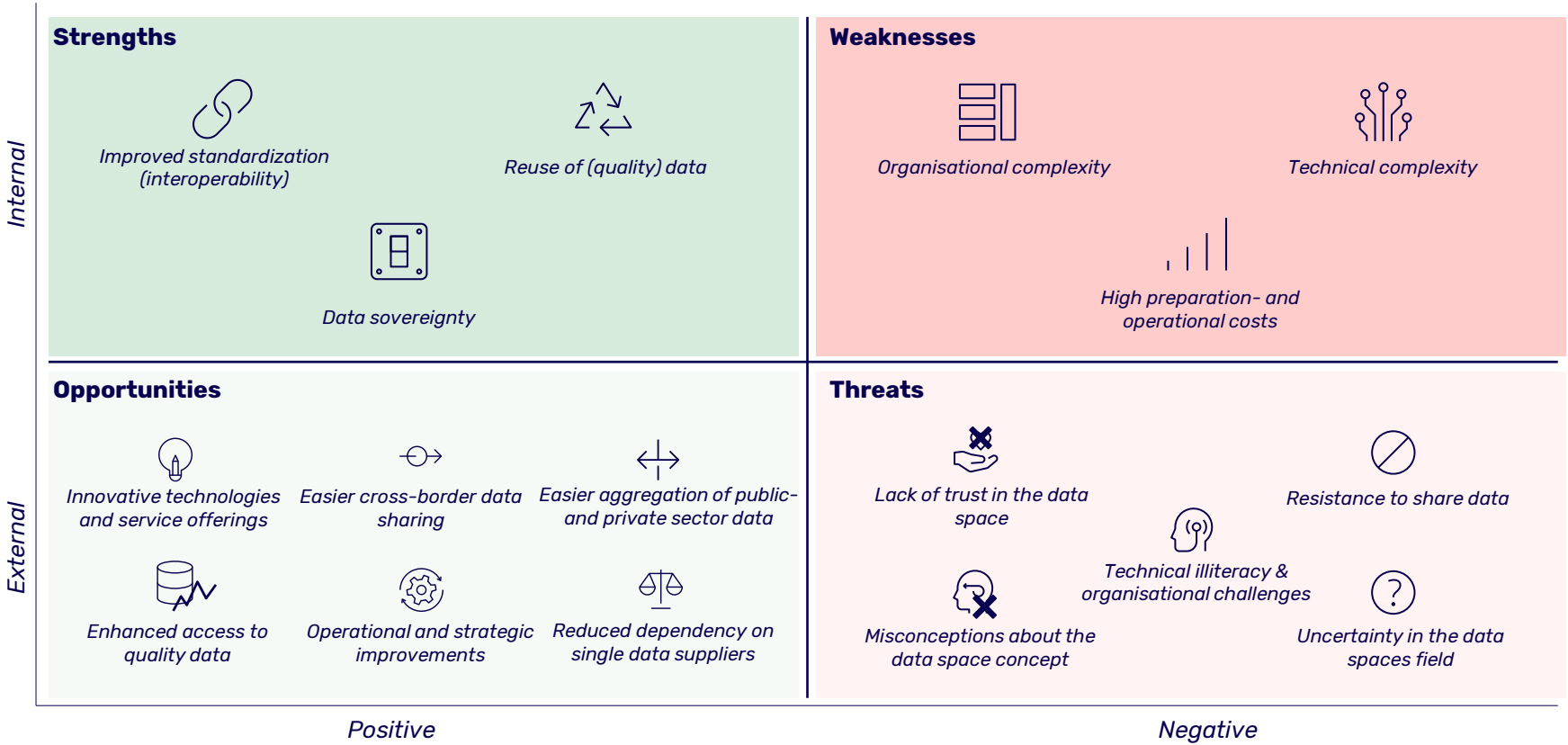
In its development of a data space for mobility, DITM must emphasize the following functional aspects (in no particular order):

- Strong governance- and legal framework (to facilitate trust)
- Data quality guarantees
- Data sovereignty
- Data security safeguards
- Easy switching between data suppliers
- Ease of integration and –use
- Support of low-latency, real-time data streams

Source: CoE-DSC Analysis

Table of contents

SWOT overview



Source: CoE-DSC Analysis

Table of contents

The main strengths of a data space for mobility are improved standardization, reuse of data, and data sovereignty

Sub conclusion

The interviewed parties overall seem to understand the main strengths and advantages of the data space approach compared to other data sharing methods. The strengths that were most addressed are the three listed below.

Improved standardization (interoperability)

- Stakeholders foresee that the agreements made in a data space, such as common standards and protocols, lead to improved standardization in the sector
- This makes it easier for sector parties to combine data from various sources in their operations

Addressed in 5/7 interviews 

Reuse of (quality) data

- Stakeholders foresee that a data space will foster data sharing as it reduces the need for bespoke relationships and agreements with each party in establishing data sharing practices.
- This means that data will be distributed for reuse of multiple parties, resulting in the potential to extract more value from it.

Addressed in 4/7 interviews 

Data sovereignty

- Several stakeholders value the main benefit of data sovereignty of a data space. These are primarily parties that hold strategically valuable data.
- Most stakeholders understand that a data space can increase the control data providers have over their data and its use, however certain stakeholders seem to not fully understand this strength and how it works, leading to misconceptions (see: threats).

Addressed in 3/7 interviews 

Source: CoE-DSC Analysis

The main weaknesses of a data space for mobility are technical complexity, organisational complexity, and high costs

Sub conclusion

Parties anticipate that implementing a data space and participating in its operations will be organisationally- and technically complex and will involve high costs. While the advantages of a data space approach in data sharing may outweigh these weaknesses, the risk lies in whether this is also perceived as such by stakeholders.

Organisational complexity

- Stakeholders foresee that implementing a data space approach can be organizationally complex due to challenges in building trust and necessary changes to current operations.
- Example from the public sector: potential conflicts of switching data providers and combining data with tender laws

Addressed in 6/7 interviews

Technical complexity

- Stakeholders foresee that integrating, processing and deriving insights from data from a potential data space may be technically complex, resulting in the need of significant technical capabilities in each organisation participating (sometimes called a common level of data maturity).

Addressed in 4/7 interviews

High preparation- and operational costs

- Parties infer that developing a data space will be costly and that costs need to be carried by participants
- Driven by technical and organisational complexity, parties see significant costs associated with the preparation for using, and in the actual participation in a data space for mobility

Addressed in 4/7 interviews

Source: CoE-DSC Analysis

A data space can unlock several opportunities, supporting both the sector as a whole and individual sector parties

Sub conclusion

- The interviewees indicated several opportunities from implementing a data space in the mobility sector in the Netherlands. Most of the highlighted opportunities can be extrapolated from the characteristics and goals that a data space for mobility would entail.
- The opportunities brought forward can be divided between opportunities for the sector and opportunities for participants individually.

Opportunities for the sector as a whole

Unlock innovative technologies and service offerings.
Improved access to data and data quality may be leveraged to create and implement new innovative technologies and service offerings.

Addressed in 4/7 interviews.

Easier cross-border data sharing.
Through standardization efforts and explicit agreements, a data space may foster cross-border data sharing relationships.

Addressed in 3/7 interviews.

Easier aggregation of public- and private sector data.
Public- and private sector organisations could potentially share data more effectively due to the possibility to safeguard against parties gaining too powerful positions

Addressed in 1/7 interviews.

Opportunities for individual participants

Enhanced access to quality data.
By fostering data sharing through the elimination of separate agreements with each partner, a data space can indirectly improve access to quality data.

Addressed in 3/7 interviews.

Operational and strategic improvements.
Through improved, data-driven decision-making, organisations can improve their operations and strategy.

Addressed in 3/7 interviews.

Reduced dependency on single data suppliers.
By allowing for easy switching between alternative service & data providers, a data space approach can relieve organisations from dependency on single players.

Addressed in 2/7 interviews.

Source: CoE-DSC Analysis

DITM needs to mitigate several interrelated threats that hinder data space adoption in the sector

Sub conclusion

As a data space intends to serve a two-sided data sharing market, the value it aims to create can only materialize if it is adopted by sufficient parties ("critical mass"). The main challenge for the data space approach is the inability to reach this critical mass. There are several threats tha may hinder adoption of the data space in the mobility sector, which must be mitigated by DITM.

Contributing factors

Lack of trust in the data space.
Significant levels of trust are needed in a data space. This may be complicated to establish and can be easily damaged by incidents.

Addressed in 6/7 interviews.

Resistance to share data.
Sector parties are hesitant to share data and join a data space due to a lack of trust in recipients and concerns over the commercial sensitivity or strategic value of their data.

Addressed in 5/7 interviews.

Technical illiteracy & organisational challenges.
The technical and organizational complexity of data spaces may make participation costly and complex, particularly to smaller organizations with limited capabilities.

Addressed in 3/7 interviews.

Misconceptions about the data space concept.
Interviewees have brought up several thoughts or concerns that we believe indicates a misunderstanding of the concept and its underlying qualities. Some examples of such misconceptions include:

- Data sharing in a data space increases dependence on other parties
- One central body controls the governance of data space and may take advantage of this
- To participate in a data space, one has to surrender control over its data

Identified* in 2/7 interviews.

Uncertainty in the data spaces field.
The establishment of multiple separate data spaces and an emerging regulatory landscape creates uncertainty, causing sector parties to hesitate in joining a data space.

Addressed in 2/7 interviews.

Source: CoE-DSC Analysis