Clarifying data providers' decision to grant data control and ecosystem strategies

Executive Summary

The Solid Readiness for business research highlighted the challenge of **data availability in the Solid Ecosystem**, with data providers being hesitant to give control to data subjects over data they perceive as their competitive advantage. Thus, this research aims to understand the **business dimensions affecting data providers' willingness to grant access control**, their **relative preferences regarding these dimensions** in a mobility personal data ecosystem, and to prioritize which ecosystem **strategies are most effective to incentivize the granting of data control**.

The research employed a t**hree-step methodology** to investigate data providers' willingness to grant control in the Solid Ecosystem. Firstly, 25 multi-stakeholder interviews explored this willingness. Secondly, the Analytical Hierarchical Process (AHP) methodology, with input from 21 mobility and data experts, assessed data providers' static preferences for business dimensions influencing the decision to grant data control. Lastly, a workshop with 6 participants examined data providers' decision-making in different ecosystem setups, analyzing three Solid Mobility Profile use cases.

First, the most important **business dimension**s affecting data providers' decisions to grant control were identified, including **Actor Relationships, Level Data Competitiveness, Privacy Risk, and Value Creation and capturing.** The relative importance data providers associate to these business dimensions were identified, giving insights into the **static preferences of data providers entering a data ecosystem**. The most important dimensions, in decreasing order of importance, are value creation and capturing, actor relationships and level of data competitiveness. It is important to note that the preferences varied significantly between sectors. The Solid Mobility ecosystem setups have shown that **data providers use their static preferences as a reference point when deciding if the ecosystem set-up aligns with their preference**s. Data providers weigh drivers for granting data control, such as value capturing, user value creation, and ecosystem value creation, against barriers for granting control, including privacy risk, actor relationships, and access to competitive data

The practical implications for ecosystem orchestrators involve **identifying a methodology for identifying the dimensions with the highest leverage to influence data providers** to grant data control for data subjects. While orchestrators cannot influence data providers' static preferences in balancing value and control, they can dynamically shape the ecosystem setup towards granting data control. The research shows the impact of different **strategies to enable granting data control.**

Purpose

The Solid Readiness for business research indicates that data availability is a significant challenge for the emergence of the Solid Ecosystem. Data providers, who currently control personal data, may be reluctant to grant data control to data subjects due to concerns about losing control over a crucial resource and sharing data with competition. Therefore, this research aims to answer the following questions: What are the **business dimensions influencing data providers' willingness to gra**nt access control to data subjects? What are the **relative preferences** of data providers in a mobility personal data ecosystem? How can these insights be applied to inform **MAAS and C-ITS use case data ecosystem setup**s?

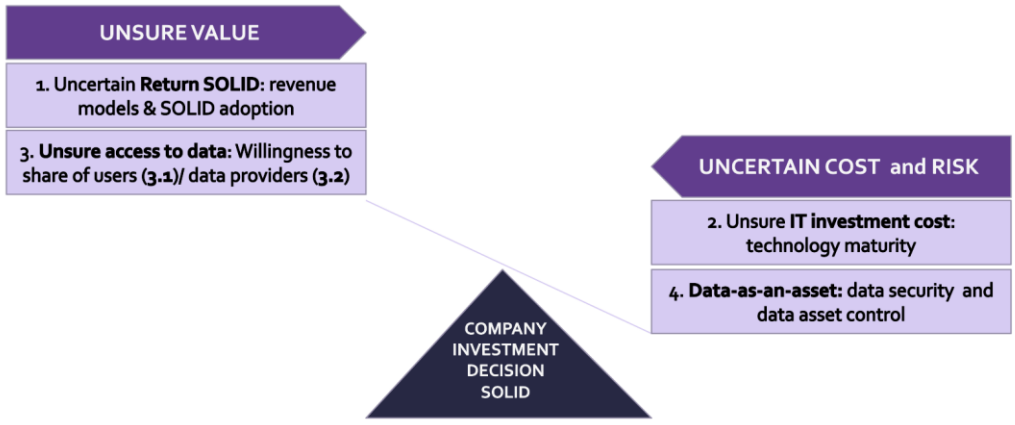

Figure 1 Company Invest Decision trade-off regarding Solid (outcomes Solid Readiness for business)

Approach

The approach is shown in Figure 2. First, 25 multi-stakeholder **interviews** were conducted in the Solid Ecosystem to explore the business dimensions for data providers granting data control. Second, the **static preferences** of data providers' business dimensions influencing the decision to grant data control were assessed using the analytical hierarchical process (AHP) methodology. 21 mobility and data experts evaluated the relative importance of dimensions on a numerical scale of 1 to 9.

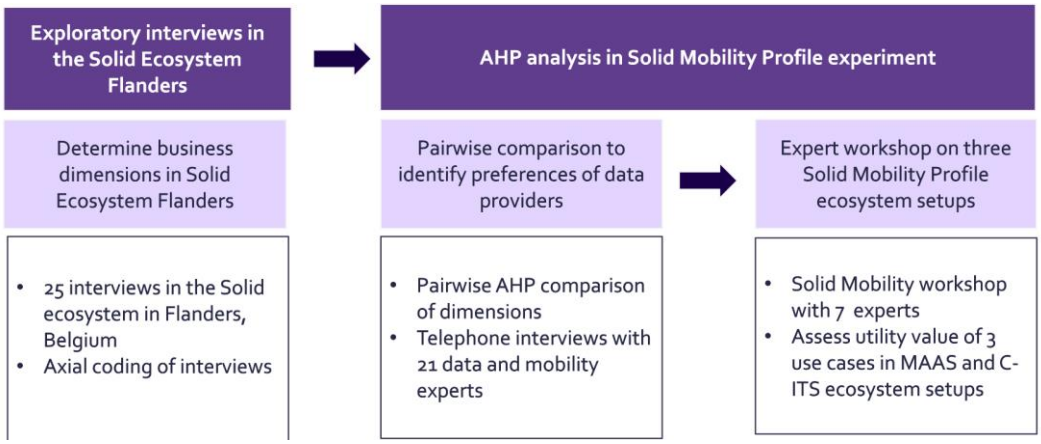

Figure 2 Methodology Research

In the final step, the decision of data providers to grant data control was examined in an **expert group workshop** with 6 participants in three MAAS and C-ITS use cases. The Solid

Mobility Profile was used as an experimental setting for the research. It is a Solid pod with the capacity to store, manage, and share personal mobility data, including identity, preferences, and location. Users retain control over their data and can share it with stakeholders like MAAS and C-ITS solutions. Three specific use cases were examined: identity verification in a MAAS ecosystem focused on data sharing between car-sharing providers (Use Case 1), and sharing between car-sharing and bike-sharing providers (Use Case 2), and location data sharing for traffic light optimization in a C-ITS solution (Use Case 3), where cyclists can opt to share real-time location data.

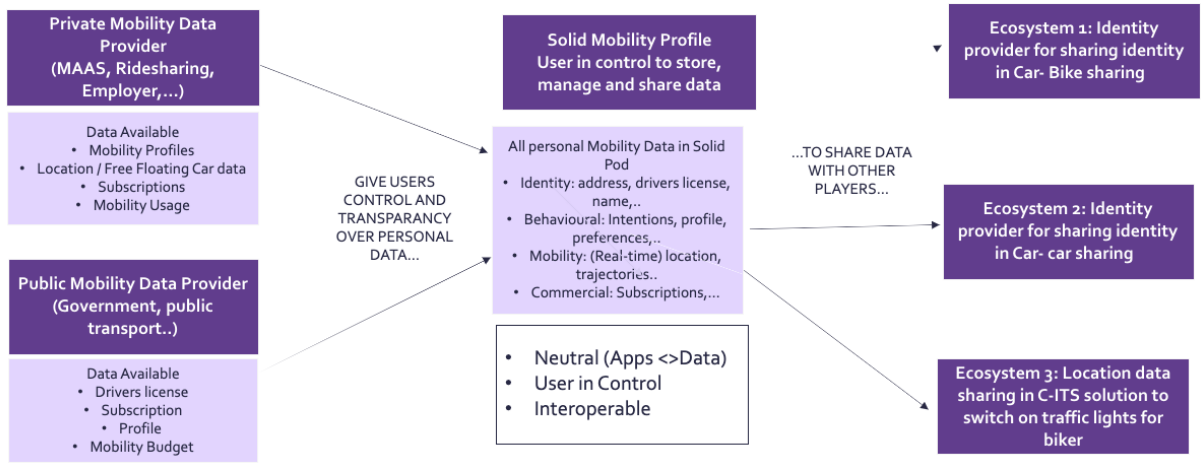

Figure 3 Solid Mobility Profile and 3 use cases

Outcomes

Business dimensions impacting the decision to grant data control

The outcomes, illustrated in Figure 4, encompass these dimensions, subdimension. The dimensions can positively or negatively influence the decision of granting data control to data subjects.

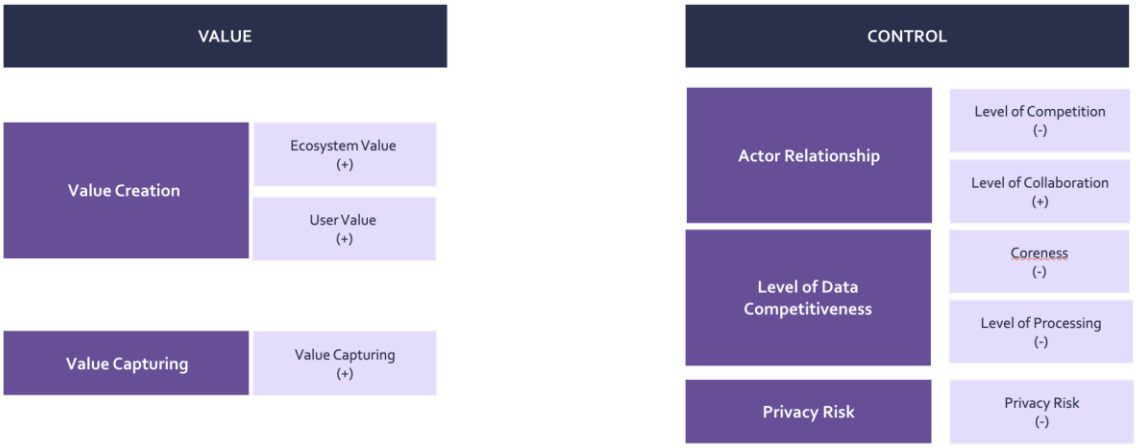

Figure 4 Dimensions and subdimensions impacting willingness to grant data control

The first dimensions include how data providers in ecosystems can **create and capture value** by granting data control to the data subject. This encompasses user value, reflecting benefits for end-users, and ecosystem value, which extends to all actors within the ecosystem. Value capturing refers to the data provider's capacity to generate sustainable returns through data control granting. Second, companies aim to control the participants in the data ecosystem who gain access to their data. The **actor relationship** dimension is crucial in granting data

control, influenced by collaboration and competition. Companies want to grant data control if data is shared with companies they collaborate with, but it is less likely when the data would be shared with competitors. Third, the **level of data competitiveness** shows that companies will be less willing to grant data control if they perceive the data as competitive. Data competitiveness depends on coreness (proximity to core operations) and extent of data processing. Data providers withhold data crucial for competitive advantage or intellectual property. Last, data providers aim to influence **privacy risk as** a high perceived privacy risk negatively affects the willingness to grant data control.

Preferences to grant data control to data subject

Figure 5 shows the preferences of data providers regarding business dimensions influencing the willingness to grant data control within the Solid Mobility Profile ecosystem observed between the MAAS sector, traffic data sector and automotive sector.

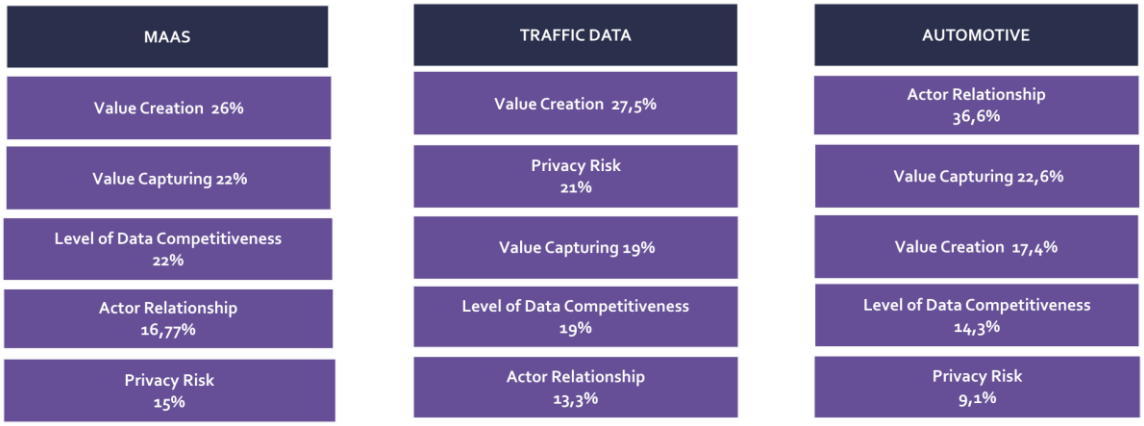

Figure 5 Static preferences to grant data control to data subjects in MAAS, traffic data and automotive

Significant sectoral variations in preferences were observed. In the case of the **Mobility as a Service (MAAS) sector and traffic data sector**, dimensions linked to value creation and capturing have the most considerable influence on data providers' willingness to grant data control. Data providers in these sectors prioritize granting data control when it leads to business returns, with value capturing being the most crucial factor. Both ecosystem value and end-user value play crucial roles in this decision-making process. Data competitiveness is another important consideration for data providers in the MAAS sector, while for the Traffic data sector the privacy risk is crucial in the decision. On the contrary, the **automotive sectod** perceives the relationship with the actors as the most crucial parameter. In this sector, the data providers are cautious that the data will not be shared with their competitor. These sectoral differences show that preferences depend on sectoral differences, which indicates that e**cosystem orchestrators need to adapt strategies for incentivizing the granting of data control on these sectoral preferences**.

Different Solid Mobility Profile ecosystem setups

This section analyzes data providers' **decisions to grant data control to data subjects in three Solid Mobility Profile use cases**. The willingness to grant data control was assessed, and utility scores were assigned to each business dimension based on data providers' preferences and the specific use case ecosystem setup. The resulting utility values indicate the readiness of

data providers to concede data control in comparison to other use cases. A higher utility value relates to a higher readiness to grant data control. Use Case 1, focused on MAAS Car-car, had the lowest utility value, suggesting a lower likelihood of granting data control to data subjects. Use Case 2, MAAS Car-bike, showed a higher chance of granting data control. Use Case 3 displayed a utility value like Use Case 2, indicating a likelihood of granting data control to data subjects.

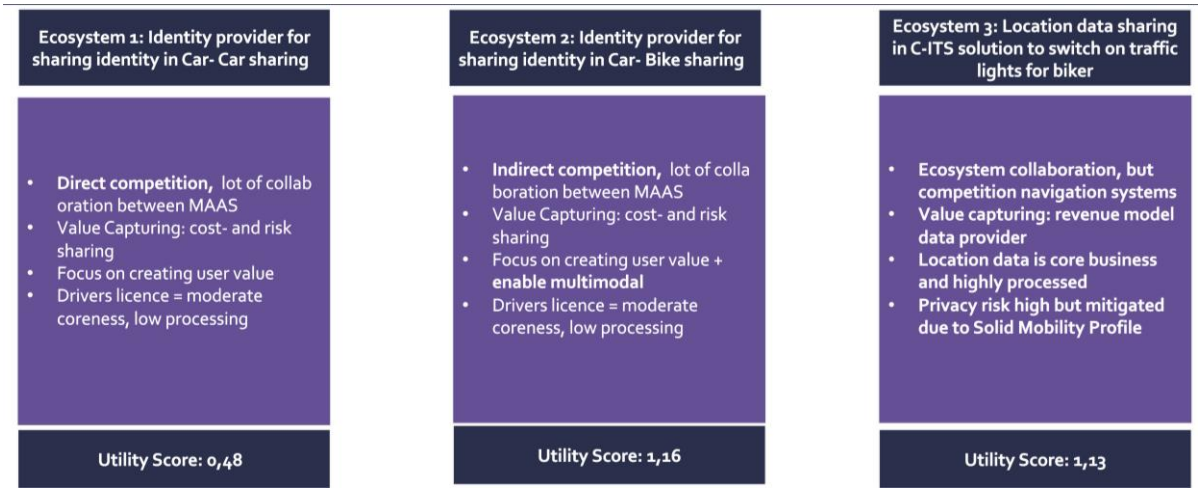

Figure 6: Overall utility value of willingness to grant data control - Use Case Comparison

Main Learnings and implications for ecosystem orchestrators

This research identified that data providers use their **fixed preferences as a benchmark when determining if the ecosystem setup aligns with their preferences**. They consider factors like value capturing, user value creation, and ecosystem value creation when deciding whether to grant data control. However, they also face barriers such as privacy risks, actor relationships, and access to competitive data. **Preferences vary across sector**s, with different weightings observed in MAAS, traffic data, and automotive sectors. **Ecosystem orchestrators can identify key dimensions with the most influence on data providers to encourage data control granting**. While they cannot change providers' fixed preferences, they can shape the ecosystem setup dynamically, as demonstrated in expert workshops rating dimensions in Solid Mobility Profile use cases. **This methodology can assist orchestrators in identifying and prioritizing impactful strategies for the sector.**

Dimension	Strategy	Weight
Value creation & Capturing	New revenue models Use Case development Enable reciprocity	48%
Level of data competitiveness	Trustworthy aggregators Shared control competitive data	20%
Actor Relationship	Determine which actors to include Ecosystem Collaboration Strategies Ecosystem agreements	18%
Privacy Risk	Decentralized and interoperable storage solutions	14%

Table 1 Potential Impact Ecosystem Strategies to enable granting data controlling the MAAS sector

The table outlines the **impact of strategies on enabling data control granting in the MAAS sector**. **Value creation and capturing strategies** have the highest impact, influencing 48% of the decision-making process. Ecosystem orchestrators should prioritize use cases with high value creation potential and assist in revenue model development. Strategies addressing **data competitiveness** safeguarding have a moderate impact, accounting for 20% of the decision-making process, suggesting the need for trustworthy aggregators or shared control mechanisms. Developing Ecosystem Collaboration Strategies has a similar moderate impact, with **actor relationships** constituting 18% of the decision-making process. Orchestrators can shape partnering constellations to influence data control. Lastly, **privacy risk** reduction has the lowest impact, contributing 14% to the decision-making process, underscoring the importance of robust data governance.

To determine the ecosystem strategies, the methodology described above should be performed to determine the preferences of data providers, leading to a prioritization of the strategies with the highest impact.