Case study: Dataspace super-app for new mobility – Award-winning RealLab Hamburg

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How data sharing in a dataspace with data sovereignty protection can create the datachains required for a novel mobility super-app to speed up travel and reduce CO2 emissions.

The problem: Bad data

Climate change requires innovation to reduce the CO2 emissions caused by mobility with gasoline cars. We would also like to get faster from A to B, particularly in cities, where trips are ever longer, expensive (for details and metrics, see Schlueter Langdon 2021a, for example). Cleaner and faster trips require more seamless travel chains, which in turn need data chains for better connections across different modes of transportation and companies.

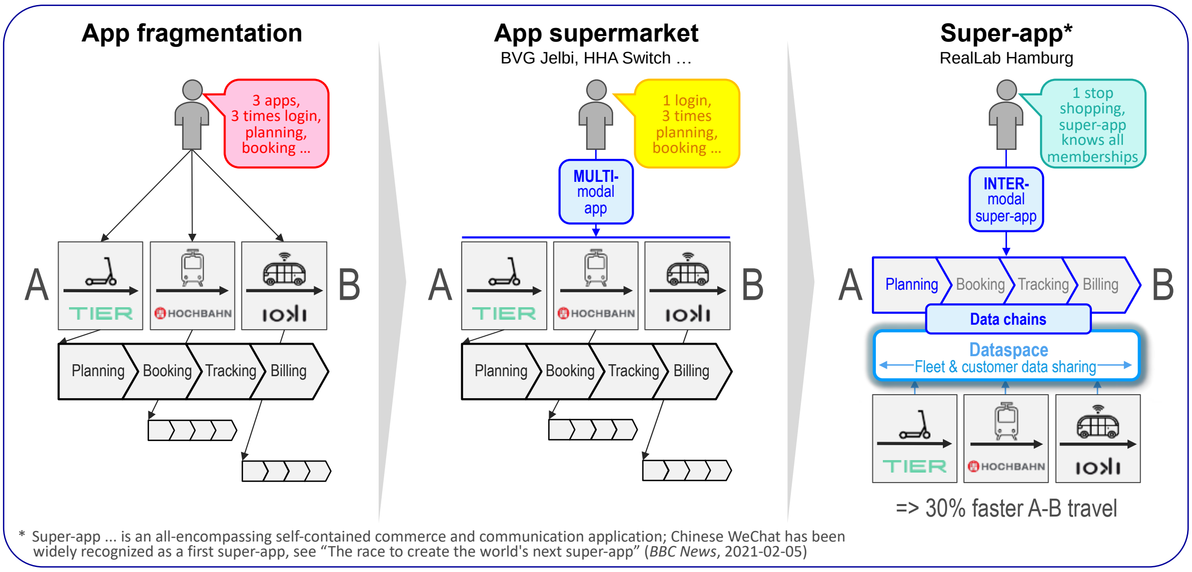


Figure 1: The dataspace difference – Facilitating data sharing for seamless A to B planning

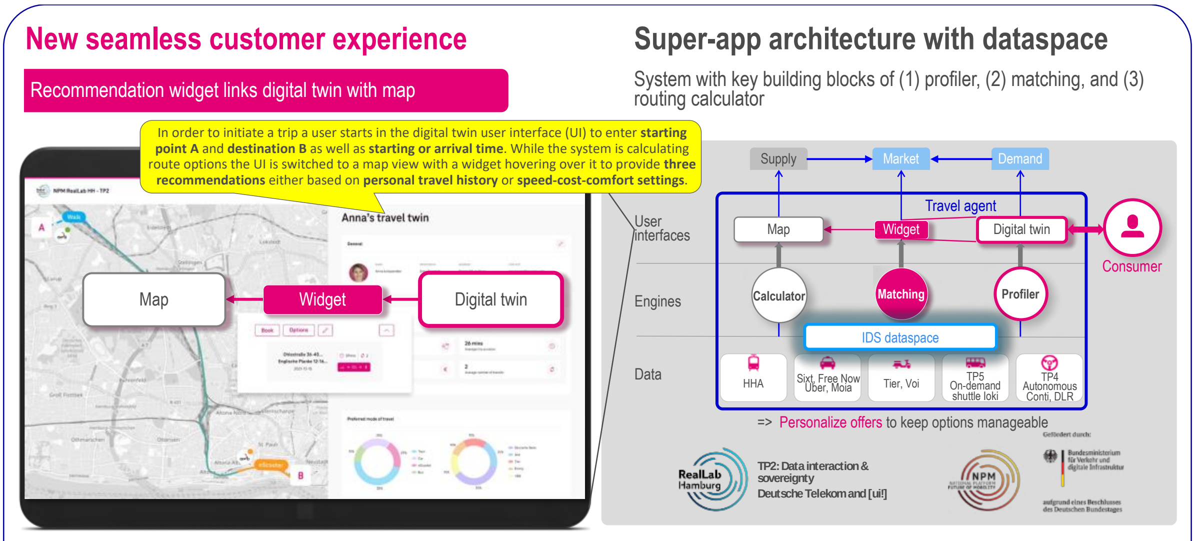
The solution: Better data

Deutsche Telekom's T-Systems IT unit has combined two innovations (TSI 2023):

1. A **dataspace** for trustful data sharing with data sovereignty protection across various transportation providers, including micromobility options like electric scooters and shuttles. The dataspace utilized first generation International Data Space (IDS) technology that complies with DIN Spec 27070.
2. A **software agent system** that leverages these cross-organizational data chains to orchestrate intermodal travel chains, facilitating a modal shift from personal car use to intermodal travel by integrating public transport with micromobility options.

Figure 1 illustrates how our solution improves mobility services, reducing the need for logins from three separate apps to one, providing a seamless one-stop-shop solution with end-to-end A-to-B routing. What is the customer experience when interacting with our mobility super-app? Figure 2 shows the user interfaces (UIs) on the left side and the underlying system architecture with the UI layer on the right side. To initiate a trip, a user starts in the digital twin UI, entering the starting point A, destination B, and the desired departure or arrival time. While the system calculates route options, the UI switches to a map view, displaying route recommendations via a widget. These recommendations can either be based on the user's travel history or on customizable speed-cost-comfort preferences.

—> Deep dive info on: Customer journeys, **system architecture**, link (Schlueter Langdon & Eckert 2022)



Adapted from: Schlueter Langdon, C., and Eckert, J. 2022. Intermodal travel super app with agent system and data space: RealLab Hamburg implementation. Scientific Paper ID 1225984, 28th ITS World Congress, Los Angeles: Figures 1, 3 and 4.

Figure 2: User interfaces and underlying system architecture with dataspace

Real world test and results

This app demonstrator was realized as part of the Reallabor Hamburg or RealLabHH as a lab of the German Federal Government's National Platform for Mobility (NPM) with funding from the German Federal Ministry for Digital and Transport. It was tested with live data from mobility providers in RealLabHH, including Hamburger Hochbahn AG, Continental, Deutsche Bahn's Ioki, Sixt, and Tier Mobility, and at the launch of the system by visitors to the ITS World Congress in Hamburg. The result of better data?

- Better mobility with **30% faster travel** speeds and less CO2 emissions.
  —> Deep dive information on **better performance**: Faster travel, easier to use, link (Schlueter Langdon et al. 2021)
- RealLabHH was awarded the "Real Laboratory Innovation Prize" by the Federal Ministry of Economics and Climate Action in 2022 (link)
  —> **Official report** RealLab Hamburg, link (RealLabHH 2022)
  —> **Business model shift**: Selling public transport by the seat, link (Schlueter Langdon 2021b)

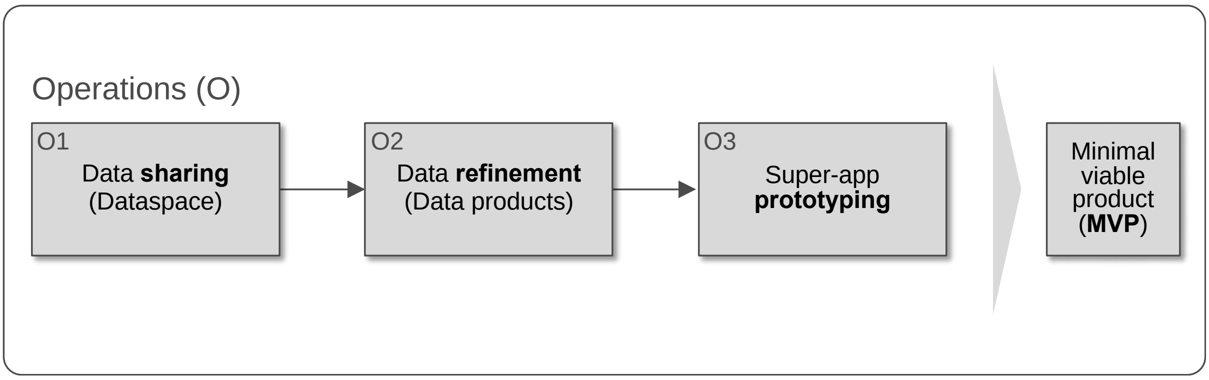


Figure 3: 3 steps for monetizing dataspace investments

Lessons for success: Slicing the challenge into 3 steps

For a quick minimal viable product (MVP) success story, lessons learned suggest (a) focusing on an initial use case, as any monetization of data ultimately requires automating a use case (Desai et al. 2022), and (b) following the famous quote, "There is only one way to eat an elephant: one bite at a time," by tackling MVP development incrementally. Figure 3 illustrates the three fundamental steps for a proven path to quick MVP success:

1. **Dataspace network**: Prepare to utilize a dataspace with sovereignty protection to share, exchange supply chain and market channel data —> **Dataspaces 101**: Link
2. **Data products**: Refine raw data into ready-to-use data accessible to various software applications, such as combining static bus schedules with dynamic micromobility location information for integrated routing —> **Data products**, digital twins: Link
3. **Super-app**: Upgrade existing apps, such as routing engines, with agent capabilities to handle both data chains and enhanced user journeys —> Dataspace super-apps: Link

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