The Austrian National Tourism Data Space

This case study explores the Austrian National Tourism Data Space, which aims to enhance the digitalisation, resilience, and sustainability of Austria's tourism sector by facilitating secure and efficient data sharing across the entire tourism value chain and adjacent domains such as energy, mobility, culture, construction, and agriculture. The initiative seeks to unlock opportunities for innovation and value creation through the development of new products and business models. The data space infrastructure allows for the merging of data from different federal states into a single asset, significantly reducing the time required to access data. The initiative also addresses challenges related to data competence, data quality, and the novelty of the data space concept. The strategic vision includes integrating the data space with the European Tourism Data Space once operational.

Description and rationale

As in most countries, tourism in Austria is a fragmented sector with many actors having access to limited data connected to their own operations. A combination of these distributed data is a huge leverage for the tourism sector towards digitalisation, resilience, and sustainability. Therefore, digitalisation efforts in Austria have been long guided by the idea to establish a data platform where these distributed data could be shared for the analysis and benefit all tourism actors. With the publication of the Common European Data Spaces strategy and a growing popularity of data spaces in Europe, Austria Tourism identified the data space framework as the most suitable mechanism for fostering collaboration and data exchange within the fragmented tourism landscape.

The primary objective of the Tourism Data Space is to facilitate secure and efficient sharing of data across the entire tourism value chain, as well as with adjacent domains such as energy, mobility, culture, construction, and agriculture, both nationally and internationally. In the times of big data analytics and AI, an interconnected data ecosystem is the biggest asset and the basis for the development of new products and business models. A long-term objective with the data space is to include data services and a marketplace as elements, allowing all interested parties to work with tourism data and develop new applications and products. The initiative therefore seeks to unlock opportunities for innovation, which is expected to lead to significant value creation in the tourism sector.

Recognising that the initiative is a long-term endeavour, the strategic vision of the data space is to integrate it with the European Tourism Data Space once this becomes operational.

Governance

The first pilot project on sharing data using a data space took place in June 2022. In May 2023, the Memorandum of Understanding was signed by the tourism partners, DIO Data Intelligence Offensive, The MODUL University, Standortagentur Tirol and Tirol Werbung, who stated their support for the development of the Tourism Data Space and sharing data using data spaces. The pilot use case was on streamlining visitor flows, but it also included one-time data transfers to test the technical infrastructure of the data space. The data included mobile positioning and crowd movement data, guest card data, weather data, and tourism infrastructure data.

The use case that triggered the development of the Tourism Data Space in Austria was on sharing tourism infrastructure data, which describes the basic infrastructure of the tourism sector. In Austria, this data covers five categories: accommodations, restaurants, points of interest, tours, and events. The data are managed on the regional level, including data input and updates. The data are then accumulated at the federal and national levels. Although the data are physically stored on one server of an IT service company, it comes from six different data management companies in Austria, and the federal states own the data. Getting access to the tourism infrastructure data for the whole of Austria thus required some administrative efforts, as each federal state had to approve the data sharing.

Methods

The data space infrastructure offers the possibility to merge the data from the different federal states into a single asset, agreeing on licensing terms once, and making the consolidated data asset available in the data space. This method of data-sharing significantly reduces the time required to access the data from weeks to minutes, it eliminates processing fees and incurs only a one-time investment into the data space connector. Furthermore, the data space ensures automatic updates of the consolidated dataset, as all

changes at the source automatically are adopted, provided the connections are established within the data space.

Technical infrastructure is a key element of data spaces as this provides the basis of trust. The technical infrastructure provider for the Tourism Data Space is Nexyo, an Austrian tech startup. The project began with one data hub for Austria Tourism in 2022, and nine data hubs for the nine federal states followed in 2023. The setup, participant onboarding and technical support were done by Nexyo. Constant co-ordination in the collaboration with Nexyo was especially important, as new technical issues frequently arose (as for example, integration of data from the knowledge graph used in Salzburg region) Weekly project meetings were organised for the period when the nine federal hubs were set up, and currently the technical support is provided completely by Nexyo, so that federal states can use their data space hubs for data sharing in their projects.

Working with tourism infrastructure data, two needs were identified: a need to align on data standards and licensing at the national level, and a need to improve data competence in the tourism sector. To meet these needs, a network of Data Stewards was established already in 2020. Its members comprise one data steward per federal state, and his or her deputy, project leads from Austria Tourism, and an external service provider specialising in data excellence and AI. Two-hour meetings are organised once every three weeks, and ad hoc data trainings (online and in person) are organised, with keynote speakers on relevant topics such as open data, data standards, and the data landscape. Working groups are organised to address specific issues, such as data licensing, data quality, and standardisation of naming conventions within the data space.

The Data Stewards network already existed when the data space was launched, and it played an important role in the training and onboarding processes. Extra sessions were used to work hands-on in the data space and experiment with different functionalities in the training environment before applying them in operational data space.

The functioning infrastructure is in place, and onboardings in the federal states has been finalised. The next steps include developing further use cases, improving the data quality and strengthening the data space governance.

In addition to the tourism infrastructure data, the data space is hosting a use case involving an AI chatbot developed by the company Goodguys for Austria Tourism and for some federal states (e.g. Carinthia). The setup in the data space allows for sharing the training data and the aggregation of user queries from chatbots in different federal states, facilitating joint analysis within the data space.

Guided by the overarching goal to strengthen the resilience and sustainability of Austrian tourism through the power of data, work is conducted to create dashboards for regions and tourism companies to serve as a tool for their day-to-day decisions. It is expected that the data sharing for these dashboards will take place through the data space in a controlled and trusted environment. For instance, the sharing of mobile network operator data will need to adhere to strict access rules, which makes this case eligible for the data space.

It is worth mentioning that not all data initiatives are suited for the data space. Instead, a targeted approach should be adopted to identify new, specific use cases where data sharing via the data space offers distinct advantages. These include, for instance, the sharing of data with strictly regulated access rights, sensitive data, and cases that include real-time data processing.

The possibility of rapidly scaling a data project is one of the advantages of data spaces compared to other types of data sharing infrastructure, as the data are saved at its source in the data storage of the data owner. Use cases where the advantages of data spaces come into play are strategically selected to avoid overcomplicating the existing data sharing processes and practices.

Data space governance is another important topic. Rules are needed on data space membership, support issues, payment options, etc., and work is being done to transfer Austria Tourism and the federal states' existing content delivery agreements into the data space policies.

Key results and lessons learnt

Insufficient Data Competence and Understanding of Cloud Operations. Two problems common in data projects in tourism are insufficient data competences and data quality issues. Data spaces function in the cloud, and an initial challenge when launching the data space was a lack of specific understanding among stakeholders of how cloud services and APIs operate. This was addressed through several training sessions, following a 'learning by doing' approach complemented by discussions of the common challenges within the Data Stewards network.

Data Quality of Tourism Infrastructure Data. When dealing with tourism infrastructure data, data quality remains both a challenge and a priority. The challenge is rooted in the decentralised nature of data inputs and updates, which are exclusively managed at the regional level. It means the need to raise awareness among numerous stakeholders about the data quality. Data Stewards play a key role in the data governance process acting as primary contacts for all the data providers the regions and encouraging them to provide high quality data inputs.

Need for Quantitative and Qualitative Data Quality Measures. Until the data are actively used, examining the data quality requires extra effort by the Data Stewards. To address this, first a quantitative metric was developed to evaluate data quality based on the fill-out rate of data fields. The Power BI dashboards on quantitative data quality are shared with the Data Stewards and updated weekly. Moving forward, last year a qualitative, content-based data quality indicator was developed based on the experience from the AI chatbot project. Based on the characteristics of the target group (e.g. "individualistic cosmopolitans" for Austria Tourism) the AI runs through all text descriptions of objects and delivers a grade about how good the description addresses this certain target group. Now we are developing a process how to set up the process to improve these text descriptions (with text input in the regions) to reach a higher grade for text quality. The solution will be probably a kind of guideline that data stewards provide to all data providers or an AI prompt improving their texts. A final review by a person will remain a must.

Navigating Developments in European Data Spaces. On top of the typical problems for data projects in the tourism sector comes the issue of the novelty of the data space concept. Many developments are happening in parallel in the field of data spaces at the European level. Constant exchange with European colleagues and other data spaces is required to keep up with the developments and to avoid common issues.

Strategic Approach to Data Space Implementation. The recommendation for all interested in data spaces is to co-operate with a trusted technical partner, focus on concrete use cases, start small, and adopt a 'learning by doing' approach. The topic seems more complicated from the outside than it is in practice.

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