# What Characterizes Data Spaces in Industry 4.0? Towards a Better Understanding

## About

This study aims to clarify the defining features of data spaces within the Industry 4.0 context by developing a comprehensive classification system, or taxonomy. The researchers analyzed 19 existing data spaces to identify their common dimensions and characteristics, providing a structured way to understand and compare them.

## Problem

As companies increasingly rely on data sharing for innovation in Industry 4.0, 'data spaces' have emerged as a key solution for secure collaboration. However, the concept is poorly defined, and the existing research is fragmented, making it difficult for businesses, especially small and medium-sized enterprises, to understand and engage with these new data ecosystems.

## Study Outcome

- The study developed a taxonomy to classify data spaces, identifying nine key dimensions (like funding, key purpose, and underlying technology) and 40 distinct characteristics.
- Most Industry 4.0 data spaces are publicly funded, primarily aim to deliver economic benefits, and are based on the IDS Reference Architecture Model.
- Access to these data spaces is typically granted through project membership or participation, rather than direct fees; no pricing models were found.
- The documentation for many data spaces often lacks clear details on whether they are fully operational, what specific types of data are shared, and what technical enablers (like AI or blockchain) are used.

## Keywords

Industry 4.0 • Taxonomy • Data Spaces • Characterization