

Implementing  
The Evolving  
Globally Integrated  
Data Space

# Robert Kahn Prize 22

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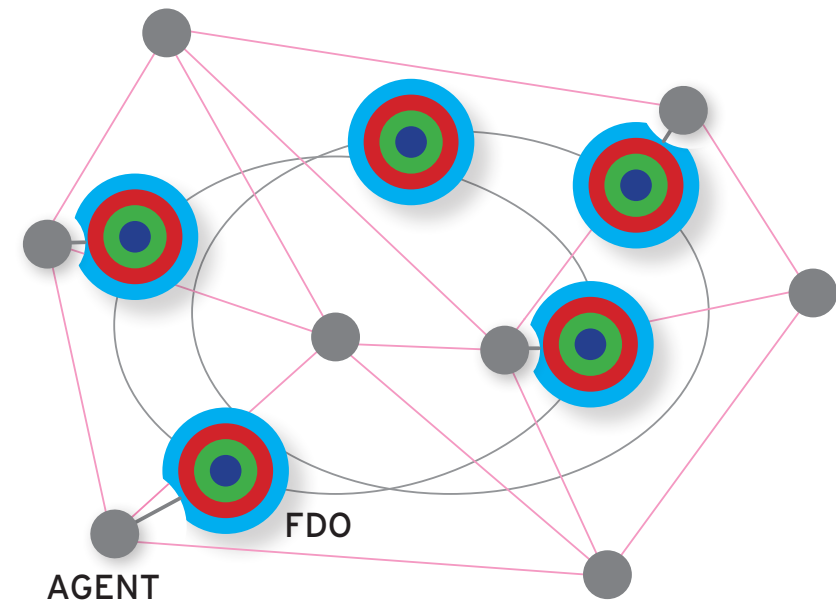
# Support the Robert Kahn Prize 2022

## ESTABLISHING THE GLOBAL INTEGRATED DATA SPACE

THE UNDERSIGNED WILL ORGANIZE A BROAD INTERNET CAMPAIGN IN 2022 TO ENGAGE MANY YOUNG SOFTWARE DEVELOPERS AND RESEARCHERS ACROSS ALL DISCIPLINES WITH THE GOAL OF ESTABLISHING THE GLOBAL INTEGRATED DATA SPACE BASED ON THE CONCEPT OF FAIR DIGITAL OBJECTS.

### VISION

The Global Integrated Data Space will be populated by standardized, autonomous and persistent entities, which contain the information needed about different kinds of digital objects (data, metadata, documents, software, semantic assertions, etc.), to enable both humans and machines to Find, Access, Interoperate, and Reuse (FAIR) these digital objects in highly efficient and cost-effective ways. These entities are independent of continuously changing technologies and the many different ways that are and in future will be organized and structured. In addition, they have built-in mechanisms to support data sovereignty. This all will help to manage data in a more sustainable and secure way.



These entities are called FAIR Digital Objects (FDOs). The Digital Object Interfacing Protocol (DOIP) is an extant minimal unifying mechanism that supports the interaction with FDOs, and it can be compared to the effect the TCP/IP protocol had for the Internet. The systematic introduction of FDOs into daily practice will stepwise lead to optimized management and use of digital data without the need to replace existing big software systems such as repositories. Many of the basic specifications for FDOs are already in existence and have been in use for some time. The FDO Forum is currently extending these specifications to make FDOs machine actionable and the German Institute for Standardisation (DIN) is engaged in turning these specifications into standards.

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### MOTIVATION

Larger and larger amounts of data are being generated every day. The complexity of the data space is increasing exponentially. According to surveys, it is already the case that about 80 percent of the effort in data driven projects is spent on data wrangling rather than on analysis and understanding, and the situation is getting worse. Therefore, there is an urgent need to change practices drastically.

Internet pioneer George Strawn expects that by 2030 we will have built one global integrated data space, all of which will efficiently support those data driven projects in industry, research, and public services that require data to be seamlessly integrated from different sources. His prediction derives from a historical perspective and the belief that intensified discussion about data management standards to overcome the heterogeneity of data will converge quickly. Since the 1950s computers made their way into all areas of life, but they were as isolated as

1950s

ISOLATED COMPUTERS AND DATA

1990s

ONE INTEGRATED COMPUTER SPACE WITH STILL ISOLATED DATA

2030s

ONE INTEGRATED COMPUTER AND DATA SPACE

the data stored on them. In the 1990s the slogan “the network is the computer” became popular as the many isolated computers were integrated into a virtual computer space thanks to the unifying TCP/IP standard. Subsequently, additional protocols such as HTTP enabled access to globally distributed documents and other data but not yet in a way that allows different types of information to be effectively recombined and reused.

An extension of these existing mechanisms to a virtually integrated data space is urgently needed and will be developed. It is now time to address the challenge of efficiently reusing relevant digital data in the pursuit of knowledge. This must include the use of suitable rights management solutions using mechanisms such as blockchains to securely manage FDO transactions. Globally harmonized data infrastructures based on FDO standards will allow the extraction of new knowledge from large data collections, supporting efforts to maintain a stable society, a healthy natural environment, and a flourishing data economy.

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### ROBERT KAHN PRIZE

The Robert Kahn Prize is named after the co-designer and developer of the TCP/IP protocol, in honor of his efforts to establish the Internet and his great contributions to computer science. Robert Kahn is also the main designer of the Digital Object Architecture, including its overall conceptual framework and, along with his colleagues at CNRI, key aspects of its identifier resolution system based on Handles (PIDs) which are used in many applications around the globe. A widely used example of such identifiers are DOIs, which are used worldwide in the publishing, movie and other industries.

The Robert Kahn Prize 2022 is meant to accelerate the progress towards the evolving data space through a set of programming challenges such as the efficient federation of existing repositories, the development of smart FDO validators, easy to use FDO collection aggregators, plus an open challenge which could, for example, focus on optimizing (public) workflow management. The prize campaign will start in April 2022 and its deadline is September 1st, 2022.

Based on a shortlist of submissions, teams will be invited to a hackathon co-located with the 1st International FDO conference in October 2022 where

participants and the prize committee will select the prize winner. The details of the campaign will be defined by the experts of the international FDO Forum, which is advancing the FDO specifications and coordinating implementations.

Responsible for the management of the Robert Kahn Prize campaign:  
Prof. Dr. Hans-Günther Döbereiner (U Bremen), Prof. Dr. Oya Beyan (U Köln), Edit Herczog (V&V Brussels), Dr. Christine Kirkpatrick (SDSC), Prof. Dr. Malte Lochau (U Siegen), Prof. Dr. Philipp Wieder (GWDG), Dr. h.c. Peter Wittenburg (FDO Forum)

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## ESTABLISHING THE GLOBAL INTEGRATED DATA SPACE

### SPONSORING

BY SPONSORING THIS CAMPAIGN, YOU CAN

- Actively help shape the FDO standard and participate in building the evolving data space,
- Take profit from the knowledge of FDO experts in the form of training courses,
- Get in contact with participants of the programming campaign and benefit from their solutions,
- Create visibility for your company or organization by being mentioned as sponsors and being present at the hackathon (if desired), and
- Gather experience in the optimization of data formats and workflow processes.

Additional wishes can be discussed. Further information about the International FDO Forum and this initiative can be requested at:

<https://fairdo.org>

[secretariat@fairdo.org](mailto:secretariat@fairdo.org)

[robert-kahn-prize@uni-bremen.de](mailto:robert-kahn-prize@uni-bremen.de)

## FDOS BENEFITS

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- Improving the sustainability of the societal and scientific memory and simplifying data management by a transparent structuring of the continuously expanding data space into modular hierarchies in a unified space of machine-actionable objects.
- Manage the increasing complexity of the data space by using persistent and inherently typed relations between digital objects and in doing so opening a path to structuring the emerging knowledge clusters and their numerous relations.
- Open the path towards automatic processing of huge amounts of data by associating procedures with types of data.
- Supporting efficient and persistent public, administrative, and analytic workflows and documentation of data provenance by systematically applied mechanisms, thus achieving a higher degree of transparency and ease for users or citizens.
- Increase the trust of users in data sovereignty by built-in mechanisms to increase data security.
- Safely storing critical legal documents such as contracts, certificates, and verdicts in FDO repositories, documented in registries, and recorded in transaction registers.
- Categorizing data semantically. Semantic metrics will quantify the qualitative via physical measurements, defined as higher order data and context correlations between the agent and the data. This will enable true semantic search, as opposed to filtering for combined keywords only.

## PARTICIPATE IN THIS ENDEAVOUR AND CONTACT US

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**THE ROBERT KAHN PRIZE** is administered at the University of Bremen and will be managed by a Steering Committee of seven experts. The details of the prize will be set by the Robert Kahn Prize committee, which will include experts from the FDO Forum and from other initiatives already engaged in using FDOs. They will specify the prize conditions and take care that appropriate services will be available.

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Dr. h.c. Peter Wittenburg (FDO Forum)

The international FDO Forum is the organization that is driving the FDO specification work and coordinating implementation activities. It consists of an increasing number of experts from many countries. The forum will closely collaborate with DIN e.V. on standardization efforts. The FDO Forum invites all experts who are actively involved in FDO work to join activities.

Visit the website

**<http://fairdo.org>**

Contact the FDO Forum:

**[secretariat@fairdo.org](mailto:secretariat@fairdo.org)**







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FAIR DIGITAL OBJECTS  FORUM