SHARCS

Selective sHARing of aCcredited Solid pod data

SETTING THE SCENE

People generate enormous amounts of data, but most of it remains locked within company systems. As a result, individuals often don't know who holds their personal data or how it is being used. Companies, too, face challenges. Since they can only access data within their own systems, they often work with outdated or incomplete information.

This fragmented approach leads to missed opportunities. To overcome these challenges, new data ecosystems, known as data spaces, are required. However, for these to function effectively, businesses will have to address technological, legal, and governance issues

In Europe, frameworks like International Data Spaces (IDS) support decentralized data control, helping to shift power away from centralized entities. At the same time, growing public concerns about privacy—highlighted by Flemish research—are increasing the demand for transparency. Regulations like the GDPR and the Data Governance Act are accelerating the move towards Web3, emphasizing trust and individual control over personal data. As a result, businesses are under pressure to rethink their data strategies and transition toward a more open, user-focused data economy.

FRAMING THE RESEARCH OBJECTIVE

This project aims to enable the secure and controlled sharing of accredited personal data stored in Solid pods. While Solid provides a decentralized way to manage data, ensuring trusted data exchange remains a challenge.

The focus of this research project is to develop solutions that allow institutions—such as governments, universities, and payroll providers—to store certified data (like diplomas and payslips) in pods while giving users secure and controlled access. Overcoming the technical challenges involved will be essential for the broader adoption and real-world implementation of technologies like Solid.

THREE MAIN OUTCOMES

The SHARCS project has developed groundbreaking extensions to the Solid ecosystem, tackling key challenges in decentralized authentication, access control, and secure data sharing. Some of its key technological advancements include:

Advanced Access Control Architecture
We have developed a decentralized access management framework based on the XACML standard (eXtensible Access Control Markup Language). One of its key innovations is the integration of a semantic reasoning engine, enabling transparent and automated decision-making for access requests. Unlike traditional solutions that rely on rigid, manually maintained access lists, our system supports dynamic, context-aware access control. This approach reduces administrative overhead while enhancing security.

Data Minimization and Selective Disclosure
We have implemented data minimization techniques that ensure only essential information is shared while maintaining the integrity of verifiable credentials. Using selective disclosure algorithms based on the Verifiable Credentials (VC) standard, users can share specific data attributes without revealing entire documents. Unlike commercial identity verification platforms that often require excessive data disclosure, our approach significantly enhances privacy and ensures compliance with GDPR principles.

Beyond technical innovations, SHARCS has provided crucial insights to drive the adoption of Solid-based ecosystems.

User Experience and Adoption Guidelines
To enhance usability and encourage seamless adoption, we have

developed a Solid App Style Guide. This guide outlines key design principles that build trust and improve user experience—addressing one of the major barriers to decentralized technology adoption.

Legal and Governance Framework
We have established a legal and governance framework to clarify regulatory requirements for Solid-based data sharing. This framework ensures compliance while fostering trust among stakeholders.

Sustainable Commercial Opportunities
SHARCS has evaluated data service pricing models that allow companies to engage in Solid ecosystems while remaining financially sustainable. Our approach emphasizes inclusivity, ensuring a diverse range of data consumers can participate and promote data reuse.

By tackling both technical and adoption challenges, SHARCS has established a strong foundation for a more secure, privacy-preserving, and user-controlled data-sharing ecosystem—offering a viable alternative to existing commercial solutions.

NEXT STEPS

The imec.icon SHARCS project has demonstrated its impact through use cases in the HR sector. However, its potential reaches much further.

Looking ahead, SHARCS aims to give individuals greater control over their personal data while promoting a fair and competitive digital economy. In a next phase, the applications should be expanded to other industries, enhancing the technology for wider adoption. Also, it is needed to work with policymakers to create supportive regulations.

By fostering innovation beyond major tech corporations, SHARCS has the potential to transform how people manage and share their data securely and in a user-centric way.

SHARCS project partners:

The SHARCS project was co-funded by imec, with project support from Agentschap Innoveren & Ondernemen and Innoviris.

FACTS

NAME	**SHARCS**
OBJECTIVE	Secure and selective sharing of accredited personal data and permission data
TECHNOLOGIES USED	Solid, Verifiable Credentials, XACML, N3, EYE, OIDC
TYPE	imec.icon project
DURATION	01/01/2023 – 31/12/2024
PROJECT LEAD	Paul Henon, Docbyte
RESEARCH LEAD	Ben De Meester, imec – IDLab – UGent
BUDGET	€ 1,142,112
PROJECT PARTNERS	Docbyte, Enhansa, Randstad Group Belgium, Trustbuilder, Datanutsbedrijf.
RESEARCH PARTNERS	Flanders Make
RESEARCH GROUPS	imec – IDLab – UGent, imec – MICT – UGent

WHAT IS AN
IMEC.ICON PROJECT?

The imec.icon research program equals demand-driven, cooperative research. The driving force behind imec.icon projects are multidisciplinary teams of imec researchers, industry partners and/or social-profit organizations. Together, they lay the foundation of digital solutions which find their way into the product portfolios of the participating partners.

CONTACT US
WWW.CONTACTIMEC.COM

imec ● Kapeldreef 75 ● 3001 Leuven ● Belgium ● www.imec-int.com