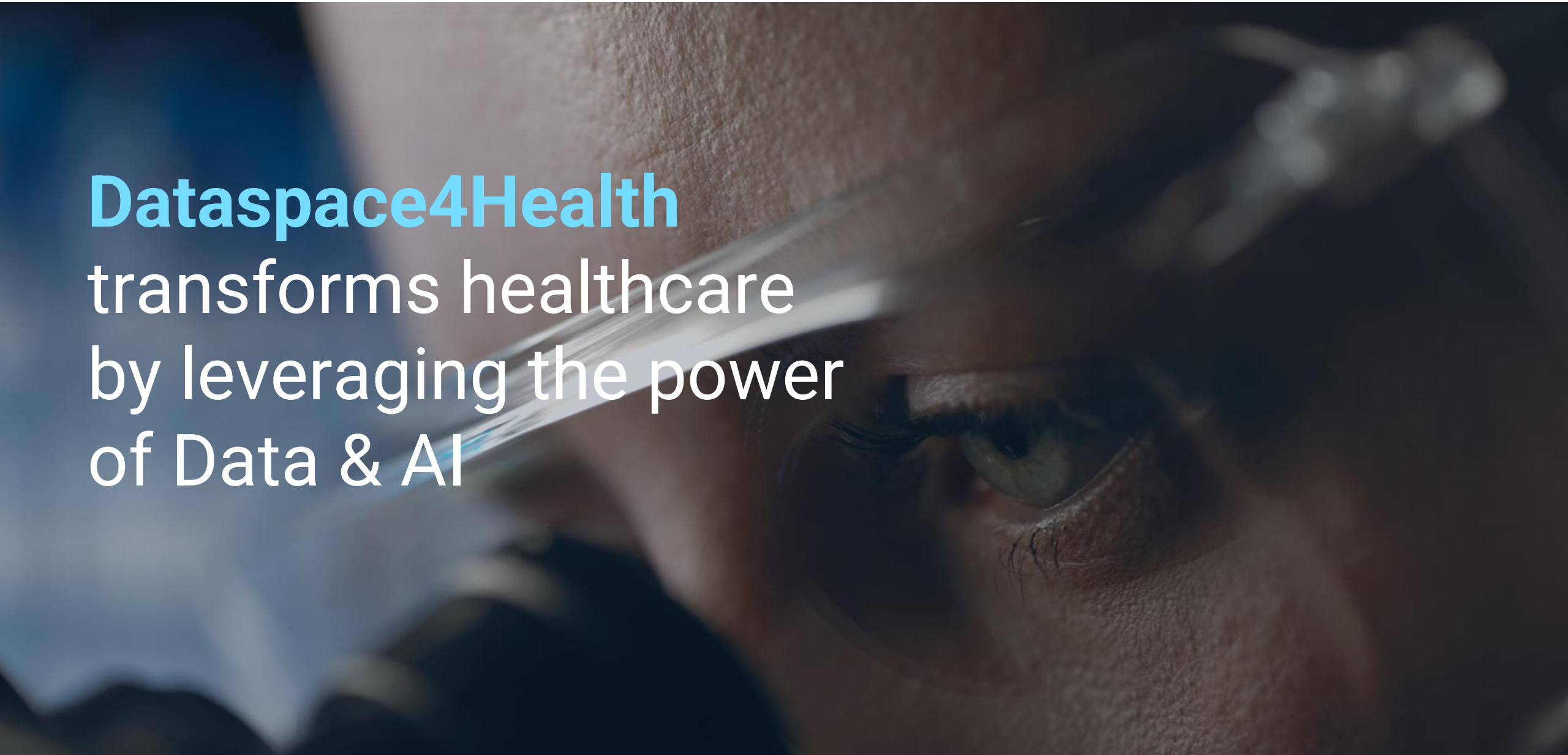


Dataspace4Health transforms healthcare by leveraging the power of Data & AI

DATASPACE 4HEALTH
LUXEMBOURG

NTT DATA

THE GOVERNMENT OF THE GRAND DUCHY OF LUXEMBOURG
Ministry of the Economy

What is Dataspace4Health?

- Dataspace4Health is **an open healthcare data exchange ecosystem**, focusing on innovation in medical treatments built on secure data sharing

- This project consortium consisting of 10 partners is **led by NTT Luxembourg and is co-financed by the Luxembourg Ministry of Economy**, as part of the national strategy based on EU regulations.

- Artificial Intelligence (AI) is a transformative technology that can significantly enhance healthcare and advance our research efforts. By leveraging AI, we can address both business and patient needs more effectively. This technology enables us to harness the potential of data, leading to the development of innovative treatment options and improved healthcare outcomes

The WHY

- The project is motivated by the need for a new approach to health data sharing that respects the GDPR and the patients' rights.
- Currently health data is often siloed, fragmented and underutilized, which limits the potential for innovation and research.
- The project will explore how to leverage the Data Space concept in combination with Gaia-X technology to ensure the interaction between healthcare stakeholders on the basis of common standards.
- It will also demonstrate the benefits of data-driven innovation and AI for healthcare and research, such as improving diagnosis, treatment, and prevention of diseases, enhancing patient outcomes and quality of life, and advancing scientific knowledge and discovery.
- This initiative aims to address both business and patient needs by ensuring compliance with regulations, unlocking the value of health data through responsible monetization, and exploring the potential of data and AI to develop new treatment options.

NTT in Luxembourg stepping in the healthcare sector

Key milestones throwback

2019

NTT run a **Digital Advisory** mission for **the hospital** that was part of the first program “Bases de la stratégie digitale”, and where the goal was to document **the digital maturity of the hospital**, define **the Data strategy** and to build a **Digital Platform Blueprint** for HRS.

2020

Large Scale Testing for Covid-19
During the 1st wave of Covid-19, **together** with **the support of the Government and the Healthcare sector in Luxembourg, NTT Luxembourg and Laboratoires Réunis**, developed a **system** to reduce the impact of the pandemic. We processed **20,000 tests** per day.

Read the case study

2021

5G IOT Healthcare platform project
NTT partnered with **Hopitaux Robert Schuman**, to leverage Public 5G for use case in Hearth disease and Stroke.

Read the case study

2024

Launch of the Dataspace4Health project
Enables a **health data exchange platform** for health data exchange in Luxembourg but also across Europe. It defines how health data is stored and exchanged. By that it allows new treatments or new drug research following EU regulation. The project is validated by two major use cases which are **Diabetes and Oncology.**

Read the Press Release

Use cases

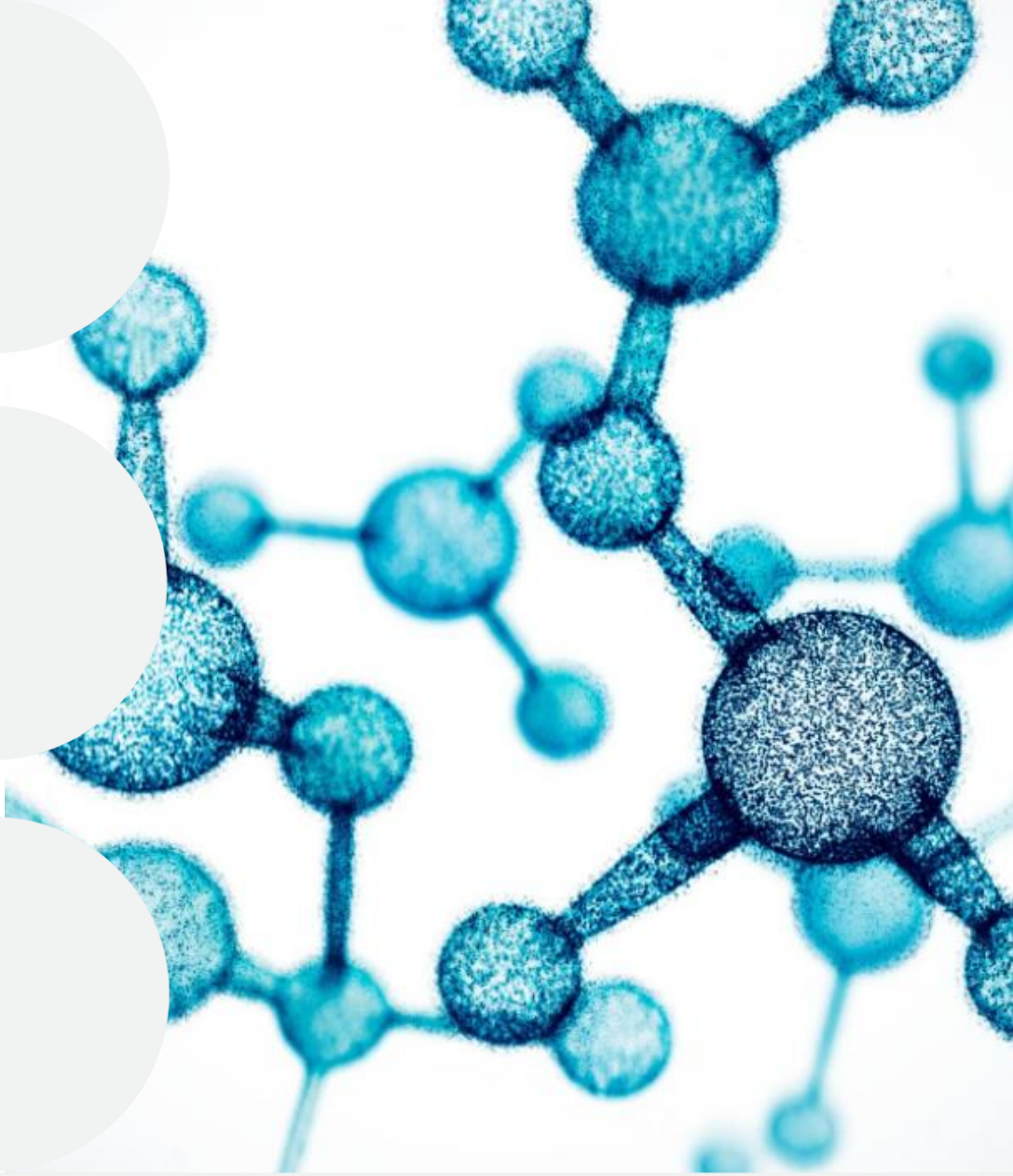
1

Diabetes affects **over half a billion people** globally, and this number is projected to increase to 783 million by 2045. Diabetes is not a uniform disease (there are type 1, type 2…), causing different complications that need individualized care. AI is seen as a potential technology to prevent them. A decision support system based on **AI** we're creating **can prevent diabetes complications** and might be a key step in the treatment of Diabetes. In one use-case, that reliable decision support system uses thousands of anonymized patient records linked to a Digital Twin of patients from LIH to provide personalized treatment.

Use cases

2

Cancer is the second leading cause of death in many countries, after cardiovascular diseases. Every year, cancer affects **tens of millions of people worldwide**, and more than half of them die from it. While hospitals are in charge of diagnosis and therapy, researchers bring novel solutions, treatments, and insights on disease mechanisms to the oncology field. The primary goal of this use-case is to **implement a precision oncology program and a federated data architecture that enables better data interoperability** and **exchange between healthcare providers and research institutions**.



What are the Data Space principles?

- **Trust** – compliance to common governance

  There are different rules to comply with, both from Gaia-X and the ecosystem itself.

  Every participant in the ecosystem must adhere to the regulations to be part of it.

  Compliance must be proven during Onboarding.

- **Interoperability** – adoption of common standards and semantic

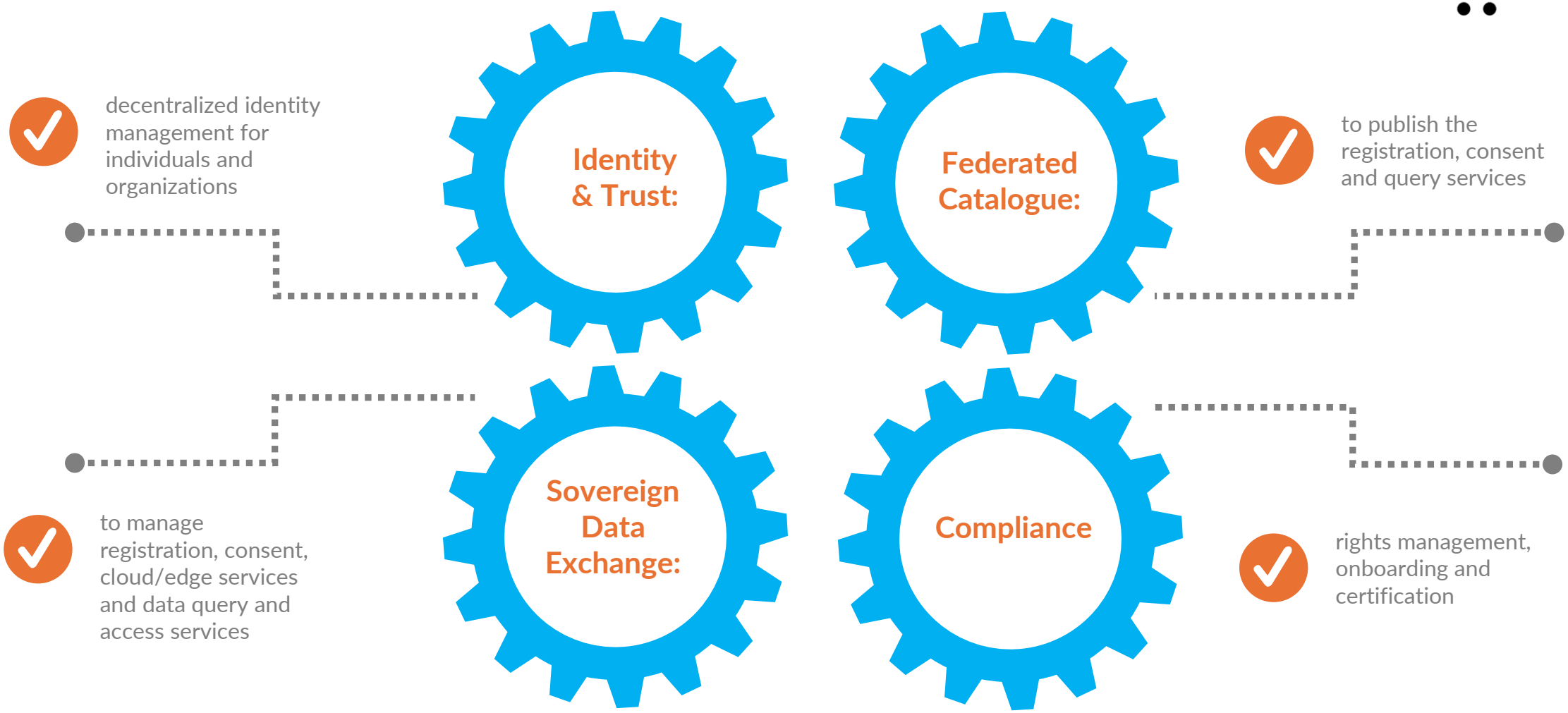
  Some of the standards are dictated by Gaia-X, like the adoption of W3C Decentralized Identifier, W3C Verifiable Credential, OIDC4VCI / OIDC4VP. Other are introduced by the ecosystem itself like OMOP / OpenEHR.

- **Data Sovereignty** – every participant keep ownership of their data

  Data exchange shall be regulated by a **contract**, stating the conditions and policies applicable to the involved parties.

  - Personal Data → Consent
  - Business Data → Digital/Smart Contract

Gaia-X Components



DATASPACE 4HEALTH LUXEMBOURG

Our collaboration system: consortium

Provides the national patient record

AGENCE eSanté LUXEMBOURG | Agence nationale des informations partagées dans le domaine de la santé

Regulates access to the data for research

LNDS LUXEMBOURG NATIONAL DATA SERVICE

Financial support

GOUVERNEMENT DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de l'Économie

LUXINNOVATION #MakingInnovationHappen

Active research for Oncology use case

LUXEMBOURG INSTITUTE OF HEALTH
RESEARCH DEDICATED TO LIFE

LNS LUXEMBOURG

INSTITUT NATIONAL DU CANCER

CHL Centre Hospitalier de Luxembourg

NCTCR National Centre for Translational Cancer Research

Project Lead

1. Technology Stream Lead
2. Business Stream Lead
3. Legal Stream Lead
4. Dissemination Stream Lead

NTT DATA

Active research for Diabetes use case

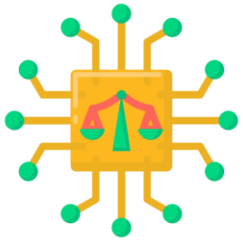
HÔPITAUX ROBERT SCHUMAN

uni.lu UNIVERSITÉ DU LUXEMBOURG

LUXEMBOURG INSTITUTE OF HEALTH
RESEARCH DEDICATED TO LIFE

Better decision making for patients

Collaboration



Legal foundation for AI in healthcare

Informed Decision Making

Innovation

Monetization of health data

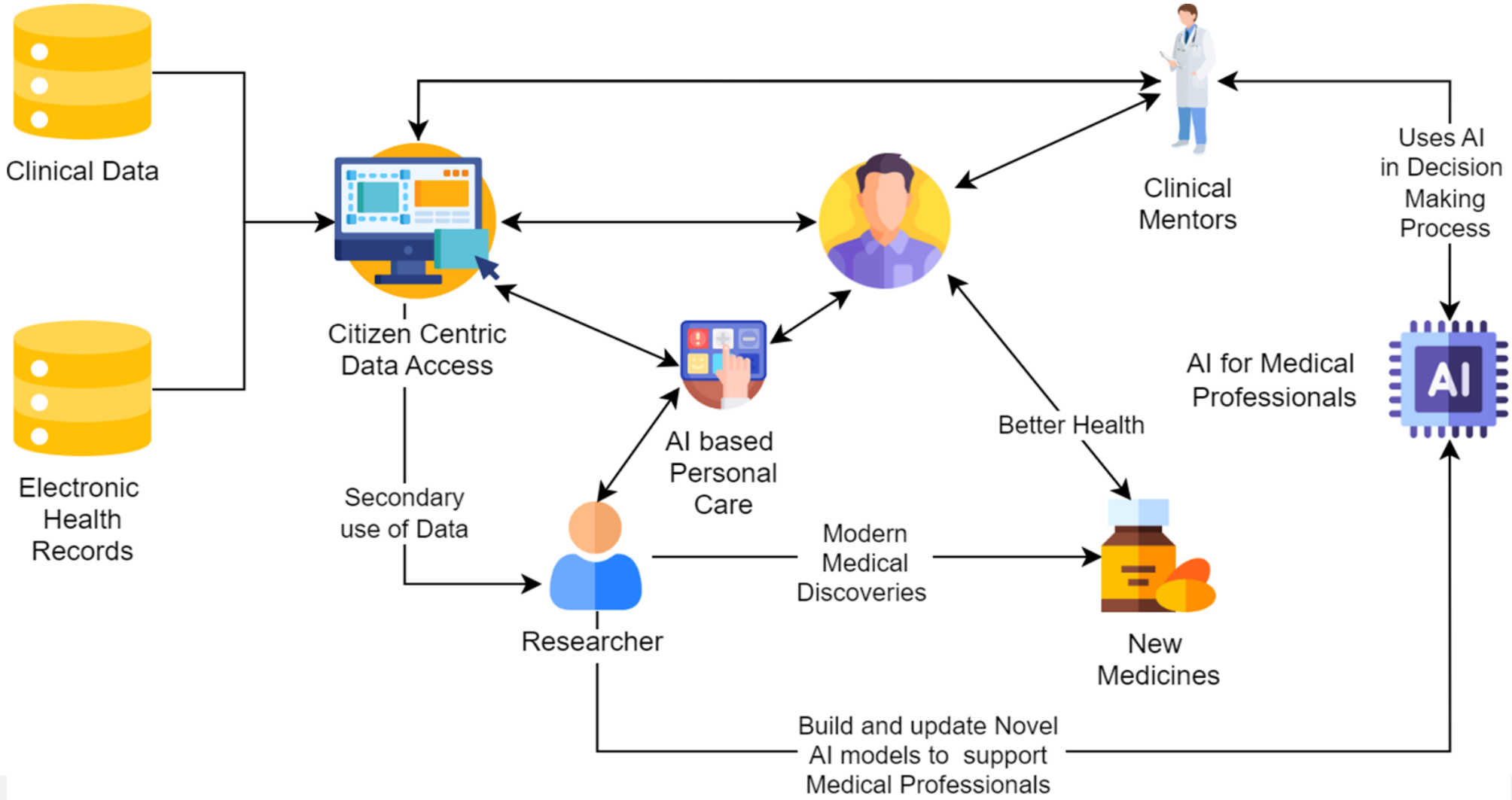
Business opportunities

Secure processing environment

Data Brokerage Services for commercial use of data

- European Health Data Space legislation allow nominal charges for providing secure processing environment and data brokerage and data a preparation services
- Combining data from healthcare and paramedical devices will really boost development of modern medicine and healthcare devices

Modern Healthcare Ecosystem



New ways to build AI for sensitive data

Easy and decentralized consent management

Processing sensitive data into secure processing environment

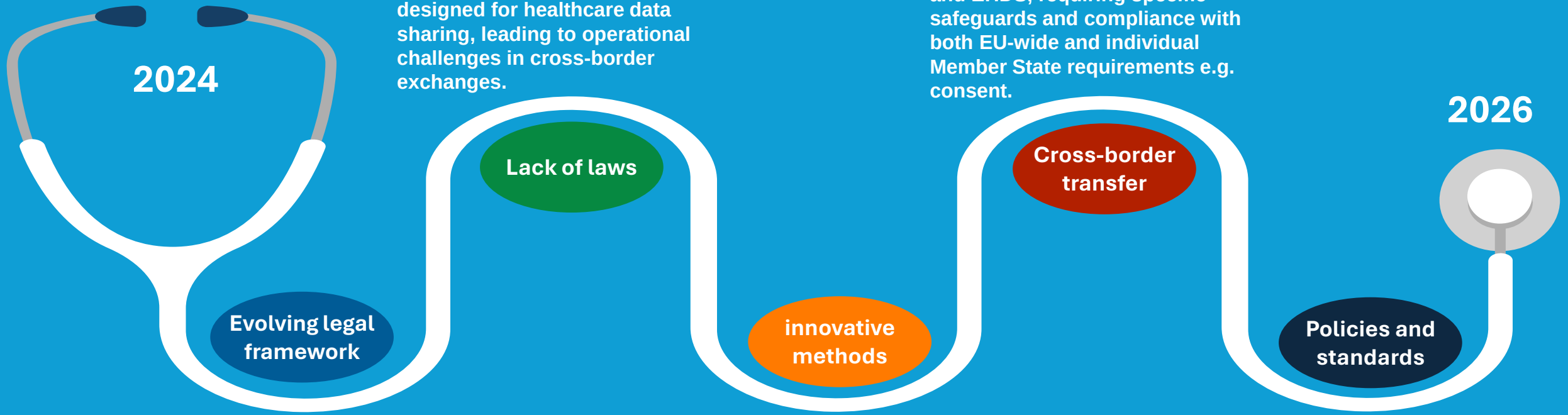
Develop and test dataspace-based AI ecosystem

The importance of this project

- **INNOVATION & SUSTAINABILITY**: The goal is to **improve diagnosis**, **treatments, and prevent diseases**. The platform also foster **research and innovation** by providing a secure access to health data
- **BUSINESS**: Dataspace4Health represents **a multi-million investment** in the future of healthcare in Luxembourg. Together with LIH as a world leading Research Institute for Healthcare is the foundation for the leading role of Luxembourg in Healthcare in Europe. By that we generate new international Healthcare business for Luxembourg.
- **PEOPLE**: Key for the success of the project is the expertise of the team in their domains. Over 70 people from the partners are working on DS4H.

A challenging project: legal framework

DATASPACE 4HEALTH LUXEMBOURG



Current regulatory frameworks create a complex web of requirements that weren't originally designed for healthcare data sharing, leading to operational challenges in cross-border exchanges.

International health data transfers face strict limitations under GDPR and EHDS, requiring specific safeguards and compliance with both EU-wide and individual Member State requirements e.g. consent.

The EU is implementing multiple overlapping regulations (EHDS, DSA, DA, DGA, AI Act) by 2024-2028, with EHDS being the first sector-specific data space requiring compliance by 2028.

Dataspace4Health, has pioneering innovative data exchange methods that current regulations didn't anticipate, necessitating adaptation of existing legal frameworks to accommodate these emerging collaborative approaches.

Those are required to sets the rules within dataspaces between the members e.g. Data Sharing Agreements, DPA, new contract structure, AI policy.

Looking forward to 2025

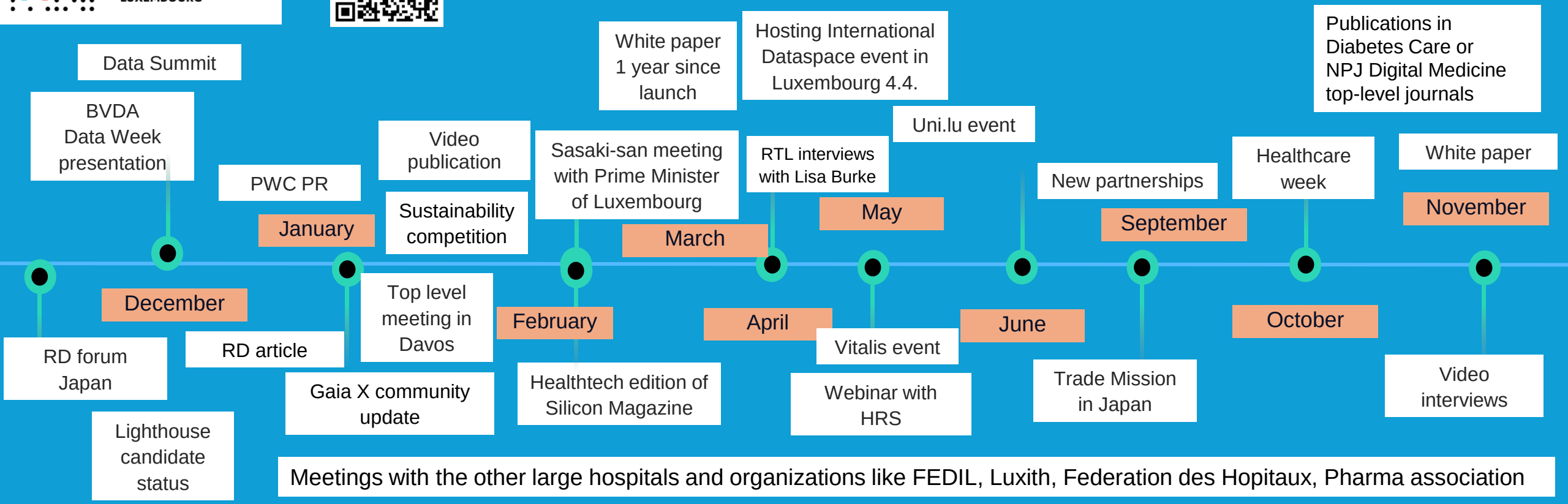
ensuring the project vision reaches audiences and drives meaningful change.

Tech for Life award winner
Nov 24

DATASPACE 4HEALTH LUXEMBOURG

1. Raising awareness so the healthcare ecosystem of providers, policy makers, researchers are aware of the project's objectives and potential
2. Encouraging adoption to maximize impact
3. Building Trust and Collaboration
4. Driving Policy and Standardization
5. Accelerating Innovation by sharing the project's methodologies
6. Highlighting social impact, foster understanding
7. Ensuring sustainability and support from the ecosystem

3 GOOD HEALTH AND WELL-BEING



Meetings with the other large hospitals and organizations like FEDIL, Luxith, Federation des Hopitaux, Pharma association

International collaboration

The Dataspace4Health team is actively collaborating with other dataspace projects from around the globe and in the scope of the Data Space ONE NTT DATA team

The Imperative of International Cooperation in Health-Related Data Spaces: A Case for Collaboration between Europe and Japan

Read the Blog

Co-authored by Michael Mossal (NTT DATA), Ralf Hustadt (Luxinnovation), Bert Verdonck (Luxembourg National Data Service), Koki Mitani, (NTT R&D), Masaru Dobashi (NTT DATA Group (HQ)), Noboru Koshizuka (Professor, The University of Tokyo) and Hiroshi Mano (Executive Director / General Secretary" of DSA)

Outcomes

- Use case driven data space platform that allows easy **deployment of new healthcare use cases**
- Validated in the first two use cases based on **Diabetes and Oncology**
- Provides the **foundation** in Luxembourg **for Data Spaces** in other verticals
- **International initiative** leveraging the **LNDS testbed** for secure health data exchange between Luxembourg and Japan.

Uschering in a New Era of Healthcare

The Future

- The EU has published the list of the first seven European "AI Factories", to which one and a half billion euros of European and national funding will be devoted. At the top of the list is Luxembourg's **Meluxina AI** project
- **Dataspace4Health** paves the way for NTT in Luxembourg to become part of the AI Factory
- The goal is that our DataSpace competences together with the University's develop the compliant Data Layer for the **Meluxina AI** in Luxembourg.
- We further see a potential collaboration in the field of IOWN APN

- Based on projects like **DataSpace4Health** and Avatar, NTT Luxembourg and the **University of Luxembourg** developed jointly competences in **Responsible AI.** The plan of the University is to build a world leading **AI Research Factory**.
- First Discussion happened already with Karasawa-san in Tokyo and (specifically on the encryption layer) with Gomi-san in Sunnyvale.

- DS4H in the context of Osaka 2025. We are currently working with the government to present **Dataspace4Health** at the Pavilion of Luxembourg at the World Expo Osaka 2025. This initiative is supported by Sato-san and Nakasawa-san who are in charge of the global NTT program around Osaka 2025

Dataspace4Health paved the way for NTT Luxembourg and **Luxembourg Institute of Health** teaming up in a upcoming **Clinical Trial** with the **NTT Research Center in Musashino** (Karasawa-san) in the Field of **Diabetes** (Microwave Glucose sensor)

The collaboration between Japan and Europe on **International Health Data Exchange** with testbed and lead in Luxembourg as extension of Luxembourg **DataSpace4Health** in line with the **AI Factory in Luxembourg.** New use cases focusing on elderly people and disease like Parkinson are in the spotlight between Europe and Japan. We plan to leverage IOWN technology like the Secure Sandbox and new stakeholders in Japan like the University of Tokyo and Medical Data Vision in Tokyo.

This visionary project paves the way for secure and compliant health data exchange, ultimately leading to a healthier future for all.