Topic: Sharing Medical Trial Data in Federated Gaia-X Data Spaces

Data collection in medical trials is becoming increasingly sophisticated through the integration of digital technologies. This enhancement includes wearable devices, electronic health records (EHRs), mobile health applications, and remote monitoring tools, which facilitate real-world, longitudinal data capture.
Gaia-X, an initiative in the realm of data infrastructure, is designed to transform how data is managed, shared, and utilized, not only in the context of medical research. Rooted in principles of digital sovereignty, interoperability, and trustworthiness, Gaia-X introduces a framework that empowers data providers, data consumers, and, critically, patients—the primary contributors of health data [1].
Digital sovereignty and interoperability under the Gaia-X framework [2] enhance patient privacy and data sharing across platforms within European jurisdiction, adhering to GDPR standards [1]. This fusion not only ensures greater control and authority [3] for individuals over their health information but also streamlines access to high-quality information for medical research, accelerating innovation by overcoming compatibility barriers.
A platform for the storage of medical trials and wearable devices data *carecentive* [4] was previously developed. The aim of this thesis is to evaluate the feasibility of Gaia-X by extending the carecentive platforms with a module that allows exchange of this data with third parties like research teams and showing the viability of the proof of concept.
In the light of that objective, this work consists of the following parts:

- Research on literature related to federated data ecosystems
- Implement the *carecentive* module for data exchange compliant with the Gaia-X initiative specifications
- Include automated tests as part of the software implementation
- Assess the feasibility and production-readiness of the Gaia-X framework by publishing data in a federated catalogue
- Show correctness of the implementation by executing at least 5 different tests in the data-exchange workflow
  - Provide at least 2 tests from the standpoint of a data provider
  - Provide at least 2 tests from the standpoint of a data consumer
- Verify compliance using the Gaia-X Digital Clearing House [5]

The thesis must contain a detailed description of all developed and used algorithms as well as a profound result evaluation and discussion. The implemented code has to be documented and provided. An extended research on literature, existing patents and related work in the corresponding areas has to be performed.

Advisors:	Michael Nissen, M. Sc., René Raab, M. Sc., Dr. med. Tobias Steigleder, Prof. Dr. Bjoern Eskofier
Student:	Jan Šimerda
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References

[1] Gaia-X Association AISBL. Gaia-X: A federated secure data infrastructure. `https://gaia-x.eu/`. [Accessed 29-02-2024].

[2] Gaia-X Framework - Gaia-X: A Federated Secure Data Infrastructure — gaia-x.eu. `https://gaia-x.eu/gaia-x-framework/`. [Accessed 03-03-2024].

[3] Prof. Dr. Boris Otto. Gaia-X and IDS, November 2021.

[4] carecentive - The Mobile and Ubiquitous Health Framework — carecentive.net. `https://carecentive.net/`. [Accessed 29-02-2024].

[5] GXDCH - Gaia-X: A Federated Secure Data Infrastructure — gaia-x.eu. `https://gaia-x.eu/gxdch/`. [Accessed 04-03-2024].