Generalising Methods To Implement a Federated Trusted Third Party – the Merge'n'Dice Project

Hinweis: Beitrag angenommen als "Poster" für die GMDS 2026 in Freiburg.

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Introduction

Key to personalized medicine is knowledge of the complete patient journey. Therefore, the combination of data from different sources is paramount. A major challenge is linking data sets without a common identifier in a way that complies with data protection regulations. The Merge'n'Dice project [1] addressed this problem and was funded from 2023 to 2026 by the Federal Ministry of Research, Technology and Space as part of the 'Datentreuhandmodelle' funding programme (grant number 16DTM231). The aim was to generalise technical approaches of the federated Trusted Third Party (fTTP) [2] to enable secure, cross-location data consolidation for various use cases, in compliance with data protection regulations.

Methods

A uniform HL7 FHIR interface for privacy-preserving record linkage (PPRL) and pseudonymisation was designed to implement different use cases. To identify the necessary use cases, a requirements analysis with stakeholders was carried out. A technical evaluation was conducted to validate the interface's practical suitability in a decentralised scenario with a focus on interoperability.

Results

After adding a 'pseudonymizePatient' interface to the 'TTP-FHIR Gateway' all use cases can now be handled uniformly: (1) centralised approaches using identifying data (e.g. in clinical trials); (2) decentralised approaches using coded data (e.g. MII and NUM-RDP); and (3) decentralised approaches using identifiers (e.g. the research data centre of the Federal Institute for Drugs and Medical Devices in Germany (BfArM)). The generic interface [3] was successfully tested with the support of five locations of the Medical Informatics Initiative (MII).

Discussion

The results demonstrate that the generalised fTTP interface can cover a wide range of use cases via a uniform interface. This reduces project-specific implementation efforts and ultimately enables faster location networking and merging of data (record linkage). Merge'n'Dice therefore makes a significant contribution to digital sovereignty in research, offering a model that transcends individual solutions. Future work can build on these generalised interfaces to further advance the networking of national research data infrastructures.

References

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