

## Electronic data capture with re:forms - a web-based and offline-capable solution for large-scale health studies and home-based data collection in rural areas

Penndorf P<sup>1</sup>, Stahl D<sup>2</sup>, Leddig T<sup>1</sup>, Franze M<sup>1</sup>, van den Berg N<sup>1,4</sup>, Thyrian JR<sup>1,3</sup>, Hoffmann W<sup>1,3</sup>, Bialke M<sup>1</sup>

<sup>1</sup> Institute for Community Medicine, Section Epidemiology of Health Care and Community Health, University Medicine Greifswald, Greifswald

<sup>2</sup> Trusted Third Party of the University Medicine Greifswald, Greifswald, Germany

<sup>3</sup> German Center for Neurodegenerative Diseases (DZNE), site Rostock/Greifswald, Greifswald

<sup>4</sup> German Center for Child and Adolescent Health (DZKJ), site Rostock/Greifswald, Greifswald

### Background

Epidemiological studies increasingly rely on multi-site electronic data capture systems (EDCS). However, offline data collection tools remain essential, particularly in clinical or rural environments with limited network coverage.

Collecting patient-reported outcome measures (PROMs) and longitudinal data at home—especially across diverse age groups—presents significant challenges. Research organizations like the German Center for Neurodegenerative Diseases (DZNE) and the German Center for Child and Adolescent Health (DZKJ) require innovative solutions with robust synchronization processes. These are vital to ensure data integrity and availability despite the inconsistent connectivity often found in rural areas.

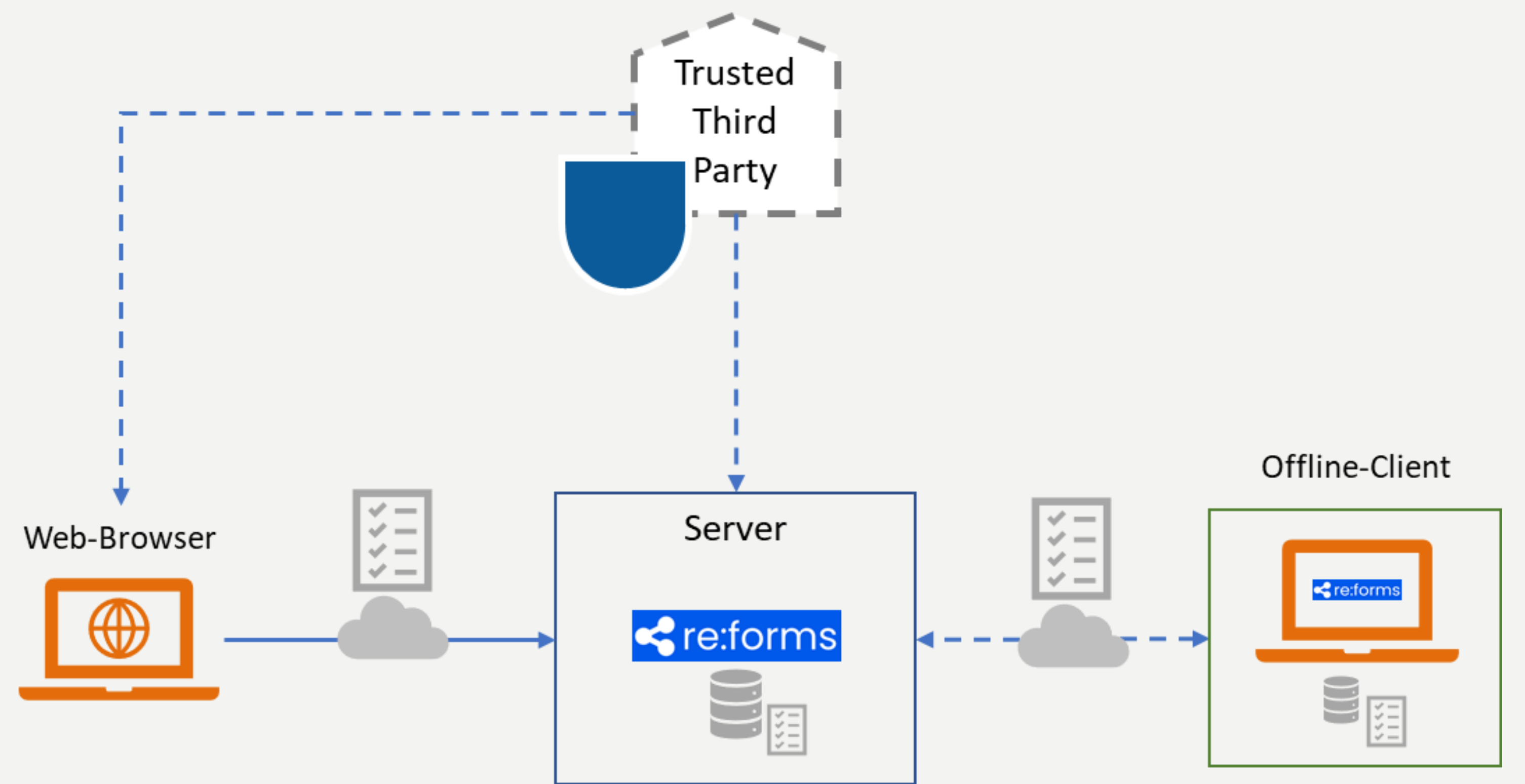


Figure 1: Overview of re:forms use cases and workflows



Figure 2: Current features of re:forms

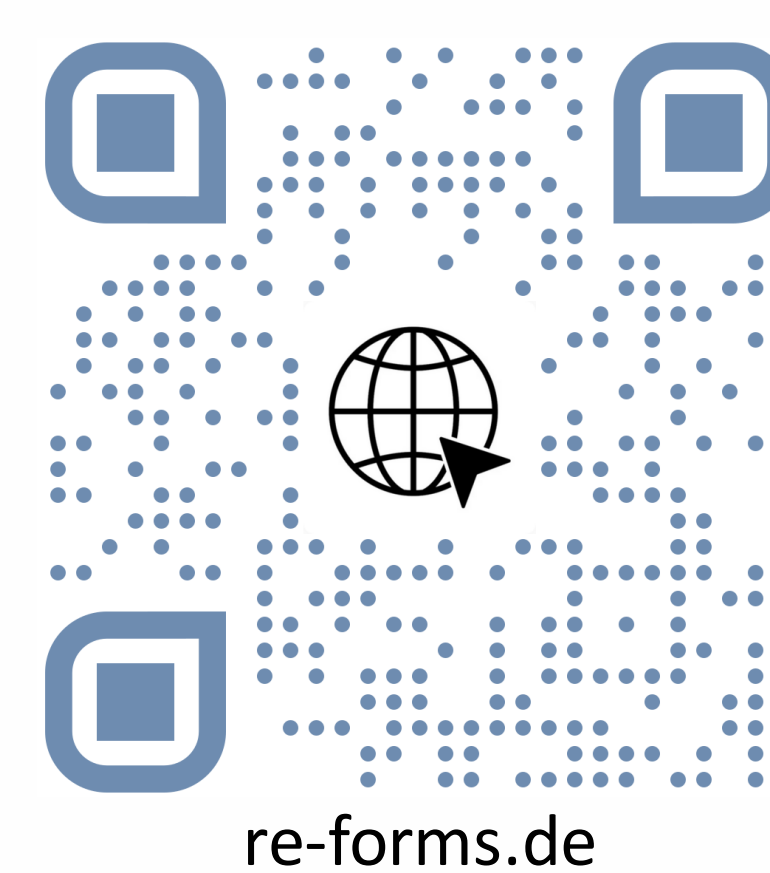
### Scope and Feature Overview

The Institute for Community Medicine at Greifswald University Medicine has developed "re:forms" ("Research Forms"), a software designed for web-based research data collection. re:forms can be utilized both centrally via a web user interface (UI) and as an offline client with asynchronous data synchronization. This EDC solution is primarily intended for research projects that require a user-friendly, high-quality data capture tool without the high costs of commercial software. Use Cases comprise classic surveys, health care research, and intervention studies. It is specifically optimized for rural areas by combining web-based EDC functionalities (comparable to REDCap) with robust online/offline synchronization processes. Re:forms was developed with a strict focus on General Data Protection Regulation compliance and privacy-by-design principles.

Unique features are the graph-based Data Dictionary, as a modern approach to data structuring and support for PROMs, a comprehensive support for patient feedback. Advanced features comprise integrated randomization options and planned participant communication via chat. A full integration of Trusted Third-Party services to support record linkage, pseudonymisation and consent management is implemented. Additional functionalities can be easily implemented through a flexible plugin mechanism.

### First Results and Lessons Learned

As of today (May 2026), we have successfully implemented re:forms [1] in several research projects at the DZNE [2], DZKJ [3], and ICM-VC [5]. Additional projects are currently in the preparation or planning phases. Each ongoing project has already provided valuable practical experience and user feedback. To date, re:forms has supported the creation of 258 forms and the definition of 4,467 survey variables, capturing a total of 30,453 datasets from 10,102 participants.



re-forms.de



Poster Download

### References

1. Institute for Community Medicine. re-forms.de [Internet]. re:forms. <https://www.re-forms.de>
2. DZNE Homepage [Internet]. German Center for Neurodegenerative Diseases (DZNE). <https://www.dzne.de/en/about-us/sites/rostock-greifswald/>
3. Deutsches Zentrum für Kinder- und Jugendgesundheit (DZKJ). DZKJ Homepage [Internet]. <https://dzkj.org>
4. Bialke M, Penndorf P, Wegner T, Bahls T, Havemann C, Piegsa J, et al. A workflow-driven approach to integrate generic software modules in a Trusted Third Party. *J Transl Med* [Internet]. 2015 [cited 2024 July 22];13:176. <https://doi.org/10.1186/s12967-015-0545-6>
5. Franze M, Ernst V, Schade S, Penndorf P, Bialke M, Hoffmann W. Data processing and data quality in a dynamic prospective cohort study in the preschool setting – first experiences from the 'GIF M-V' project with the eCRF solution re:forms. (Poster) 20. Jahrestagung der Deutschen Gesellschaft für Epidemiologie; 2025 Sept. 25; Münster. In: PUBLIC HEALTH FORUM. Band 33 (Heft s1):506-507; DOI: <https://doi.org/10.1515/pubhef-2025-8001>