Privacy in e-Health
- Enforcement of Privacy-compliant Disclosure of Personal Data -

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Medical Services and Disclosure of Patients’ Health Data to 3rd Parties

- Service providers act as data consumers and data providers
  - Availability of patients’ health data by electronic health records
  - Service providers (e.g. company) provide electronic health records
  - Data consumers collect, use, and store the patients’ personal data
  - Data providers disclose/delegate personal data to service providers
  - Privacy promise: Service providers handle personal data according to the agreed upon privacy policy between patients and service providers

No Control on the Disclosure of Patients’ Health Data

- Identity Management and Delegation
  - Privacy by non-linkable credentials
  - All credentials and pseudonyms are based on secret key
  - All-or-nothing delegation → Loss of control

- Digital Watermarking and Disclosure to 3rd Parties
  - Copyright protection by labeling digital content
  - Symmetric watermarking scheme: Both service providers get the same watermark → Non-distinction of last data provider

Controlable Disclosure of Patients’ Health Data by DREISAM & DETECTIVE

- DREISAM: Non-linkable Delegation of Rights
  - Authorization: Delegation of access rights to user’s data
  - PKI-based protocols with cryptographic commitments and zero-knowledge proof for non-linkability
  - Proxy credentials instead of sharing secret key

- DETECTIVE: Documenting Delegations of Personal Data
  - Ex-post enforcement by identifying last data provider
  - Linking the identities of data provider and consumer to disclosure by cryptographic commitments and digital watermarking
  - Verification by patient due to delegated rights as watermarking key

Evaluation: Proof-of-concept implementation for medical services with electronic health records (x-ray images)

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