Privacy in e-Health

- Enforcement of Privacy-compliant Disclosure of Personal Data -

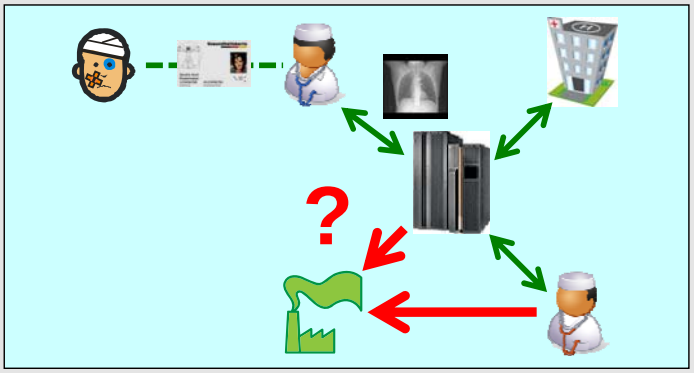
Dr. Sven Wohlgemuth Prof. Dr. Isao Echizen Prof. Dr. Noboru Sonehara Prof. Dr. Günter Müller

National Institute of Informatics, Tokyo, Japan University of Freiburg, Germany

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

Service providers act as data consumers and data providers

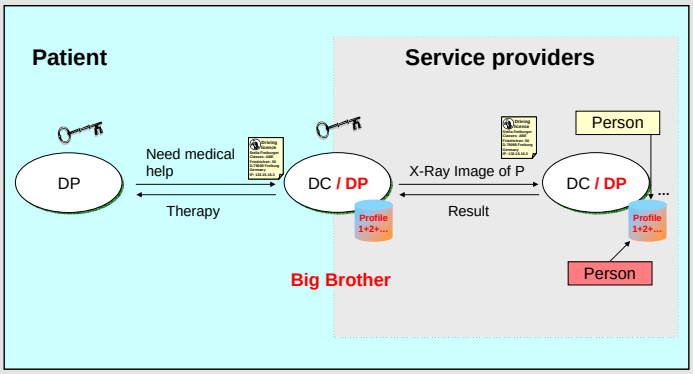
- Availability of patients' health data by electronic health records
- Service providers (e.g. company) provide electronic health records
- Data consumers collect, use, and store the patients' personal data
- Data providers disclose / delegate personal data to service providers
- Privacy promise: Service 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

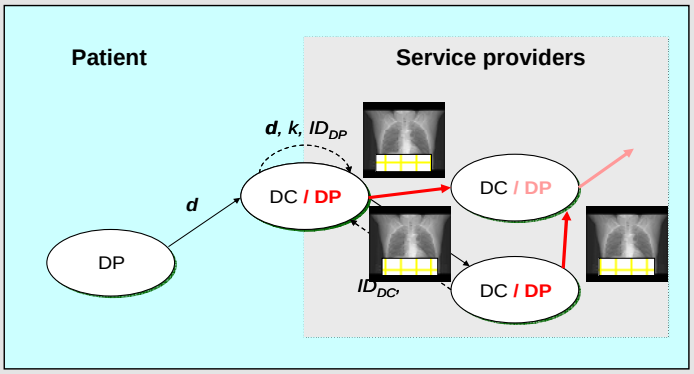
Identity Management and Delegation

- 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

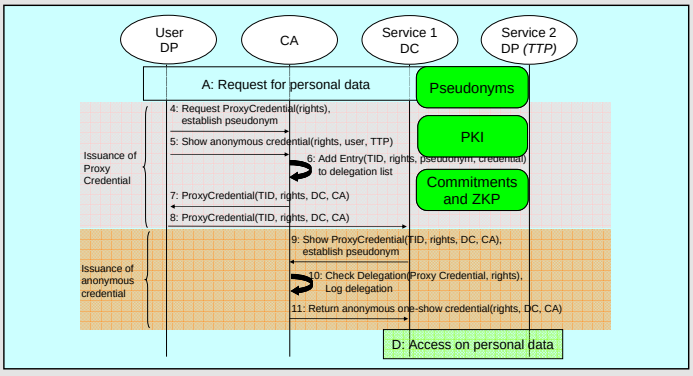
- Copyright protection by labeling digital content
- Symmetric watermarking scheme: Both service providers get the same watermark → **Non-distinction of last data provider**



Controllable Disclosure of Patients' Health Data by DREISAM & DETECTIVE

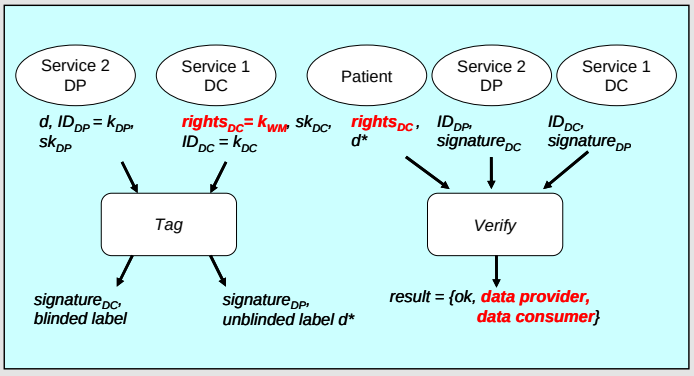
DREISAM: Non-linkable Delegation of Rights

- 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)

Contact: Dr. Sven WOHLGEMUTH – DAAD Postdoctoral Scholar at the Digital Content and Media Sciences Research Division
TEL : 03-4212-2594 FAX : 03-3556-1916 (c/o Prof. Dr. Echizen) E-mail : wohlgemuth@nii.ac.jp WWW: www.nii.ac.jp