Privacy-Awareness in Clinical Workflows

Check out the Poster!

Saliha Irem Besik, Prof. Johann-Christoph Freytag, Ph.D.
Humboldt-Universität zu Berlin, Department of Computer Science
{besiksal, freytag}@informatik.hu-berlin.de

Problem

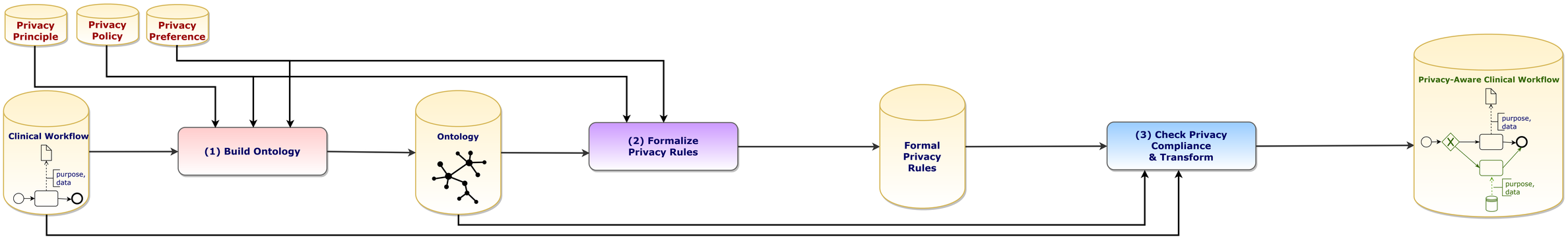
A clinical workflow might have privacy issues due to involving sensitive patient data and multiple healthcare providers.

Privacy-aware Workflows are compliant with:

- privacy principles based on the EU General Data Protection Regulation,
- privacy policies provided by healthcare providers, and
- privacy preferences of data subjects (patients).

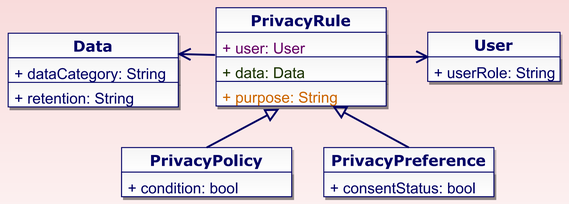
We aim to transform existing non-privacy-aware workflows into privacy-aware ones.

Solution

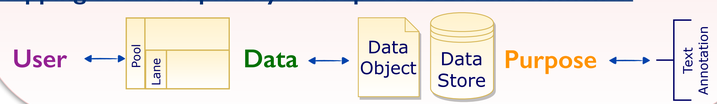


(1) Build Ontology

Ontology for main components of privacy rules:



Mapping between privacy concepts and BPMN elements:



(2) Formalize Privacy Rules

Example of Privacy Rule:

- *Informally:*
  Alice gives consent that only pediatrician Bob can perform hearing screening for 6 months on March 21, 2019.
- *Formally:*
  (Alice, only Bob, hearing-screening, any, 6months, 2019-03-21)
- *Genaral Schema:*
  (dataSubject, user, purpose, data, duration, entryDate)

(3) Check Privacy Compliance & Transform

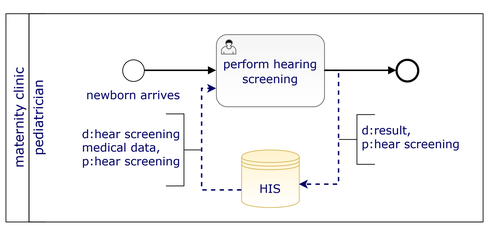
`foreach` data operation tasks with annotation *[Data, purpose]* `do`

`foreach` privacy rules with *purpose* `do`

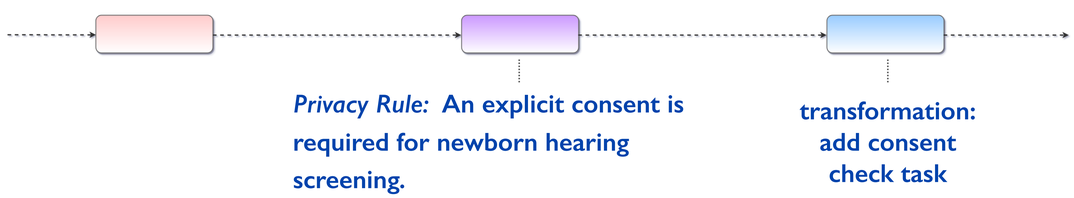
`if` privacy violation `then`

`apply` predefined transformation action

Use Case: Newborn Screening in Germany

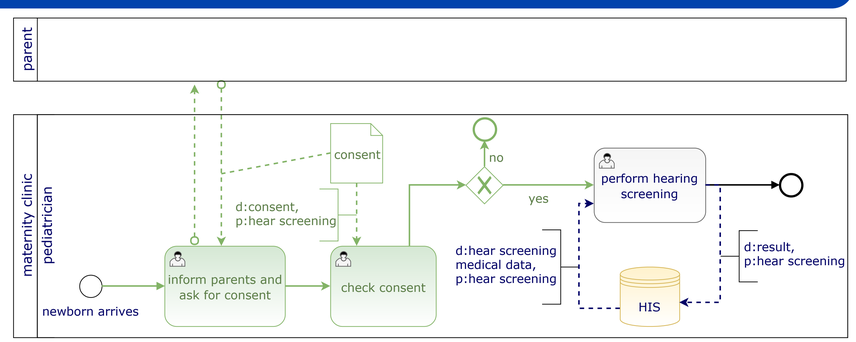


Hearing Procedure Clinical Workflow



Privacy Rule: An explicit consent is required for newborn hearing screening.

transformation: add consent check task



Hearing Procedure Privacy-Aware Clinical Workflow