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i2b2 impemented over SMART-on-FHIR

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- i2b2 has more than 200 implementations over the world
- Multicenter research produces more powerfull results
- Federation tools such Shrine, Insite, Trinetx federate multiple i2b2 instances

$\rightarrow$ What about institutions without i2b2 ?

Data Velocity

ETL processes are time/space/humans consuming

i2b2 needs a dedicated informatic team

Data Variety

Terminology Mapping tools in their infancy

Big Data i2b2 star schema cannot handle

Data Volume

Big Data i2b2 star schema cannot handle
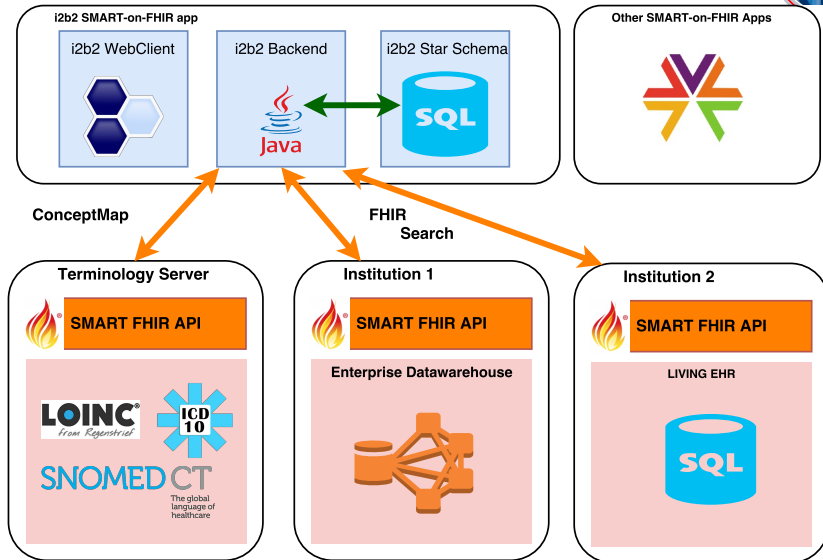
Dedicated technology

- ▶ FHIR specifies how EHR should share data
- ▶ FHIR specifies both a *Search* & a *Terminology Mapping* API
- ▶ EHR vendors are more & more FHIR conformant
- ▶ SMART-on-FHIR specifies how Apps should consume data

$\rightarrow$ Let's i2b2 be a SMART-on-FHIR app !

Methods
i2b2-FHIR

Change made to CRC cell

- ► New pm_cell_data entry to point to URL of FHIR
- ► By using the project_path can configure to use different FHIR API for different projects
- ► Easy to change without restarting i2b2
- ► Limited to one FHIR API per project

Change made to PM cell

- ► New class written that extends Panel Items
- ► Any ontology item that begins with FHIR is sent to the new class
- ► The Item Code, constraint value and date contraints are sent to the FHIR API
- ► . . .

→ Mixed Query is Working (star schema/FHIR endpoint)
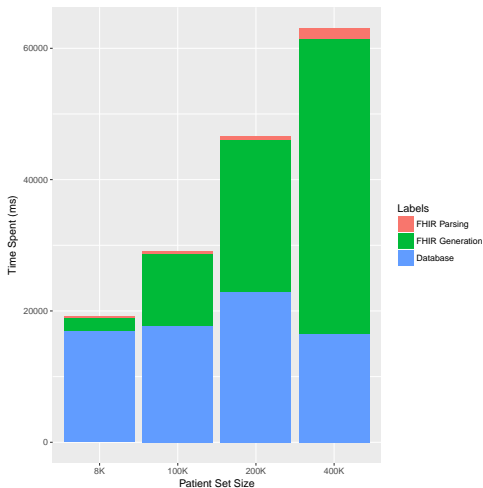
5B   physiological   table

- ▶ FHIR generation step bottlneck
- ▶ under the minute
- ▶ sub-linear performances

→ Bridging the gap (i2b2 / big-data platforms)

Work done:

- Ontology Model
- Querying FHIR API
- Mixed star schema & FHIR API & No-SQL DBs

Roadmap:

- Oauth2 securisation
- Multiple FHIR endpoint
- Performance optimisations (parallel FHIR API calls)
- Release as a SMART-on-FHIR app

- ▶ Proof of concept done
- ▶ New area for Data federation
- ▶ New area for Massive data handling in place
- ▶ Work in progress to release in future i2b2 version

Thank you

Core i2b2 www.i2b2.org/software
FHIR API https://github.com/parisni/i2b2-fhir-search
FHIR i2b2 https://github.com/mikemendis/i2b2-fhir-search