

MIRACUM: Sharing Data for a Learning Health System

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The German Medical Informatics Initiative

Goals

Innovative IT solutions to improve research & patient care

- starting at university hospitals & extending to smaller sites

Intensify the exchange and sharing of data

- between research and the health care delivery system

Re-establish medical informatics as a progressive field

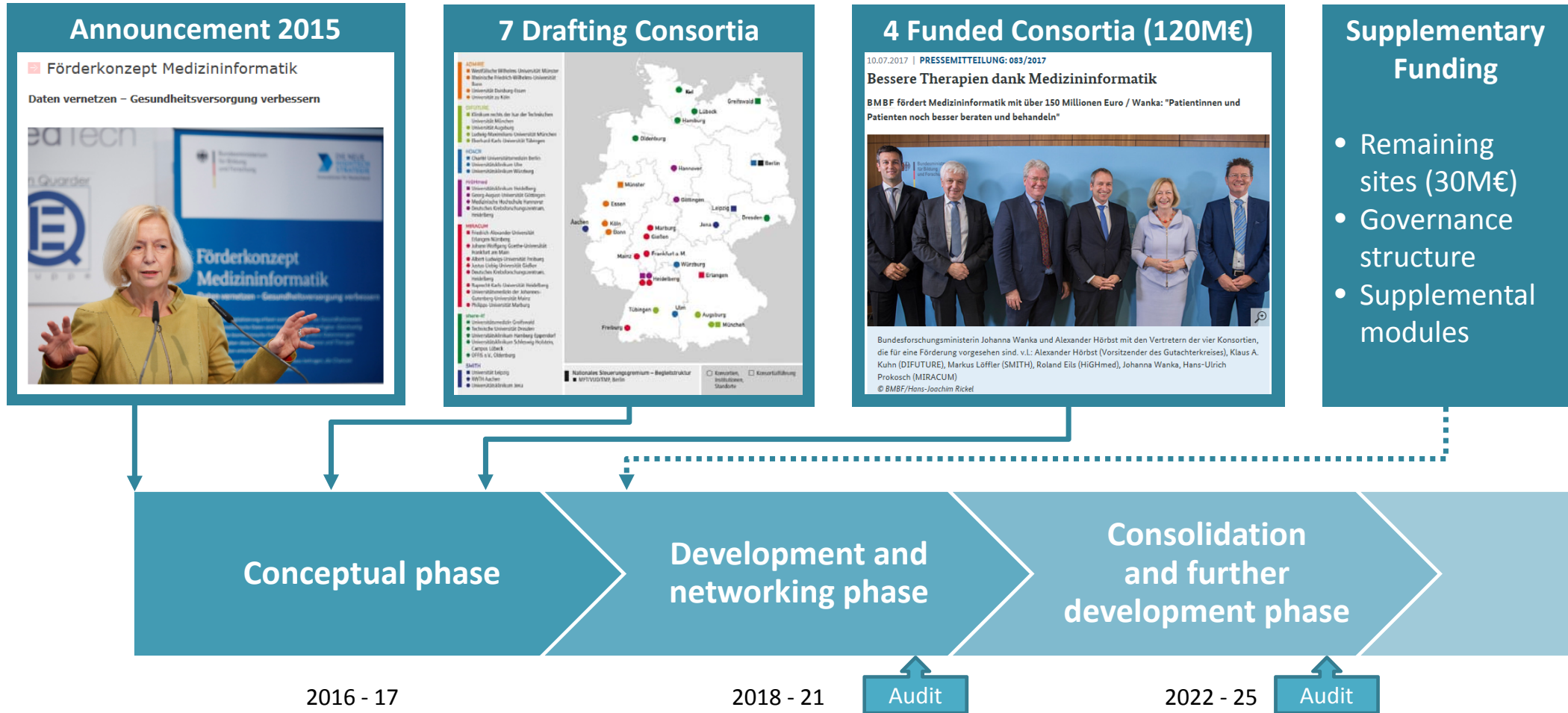
- in research, teaching and continuing education

Set up data integration centers (DIC)

- to pool local data resources and network with other sites



The German Medical Informatics Initiative Timeline and Current Status



The MIRACUM Consortium

Medical Informatics in Research and Care in University Medicine

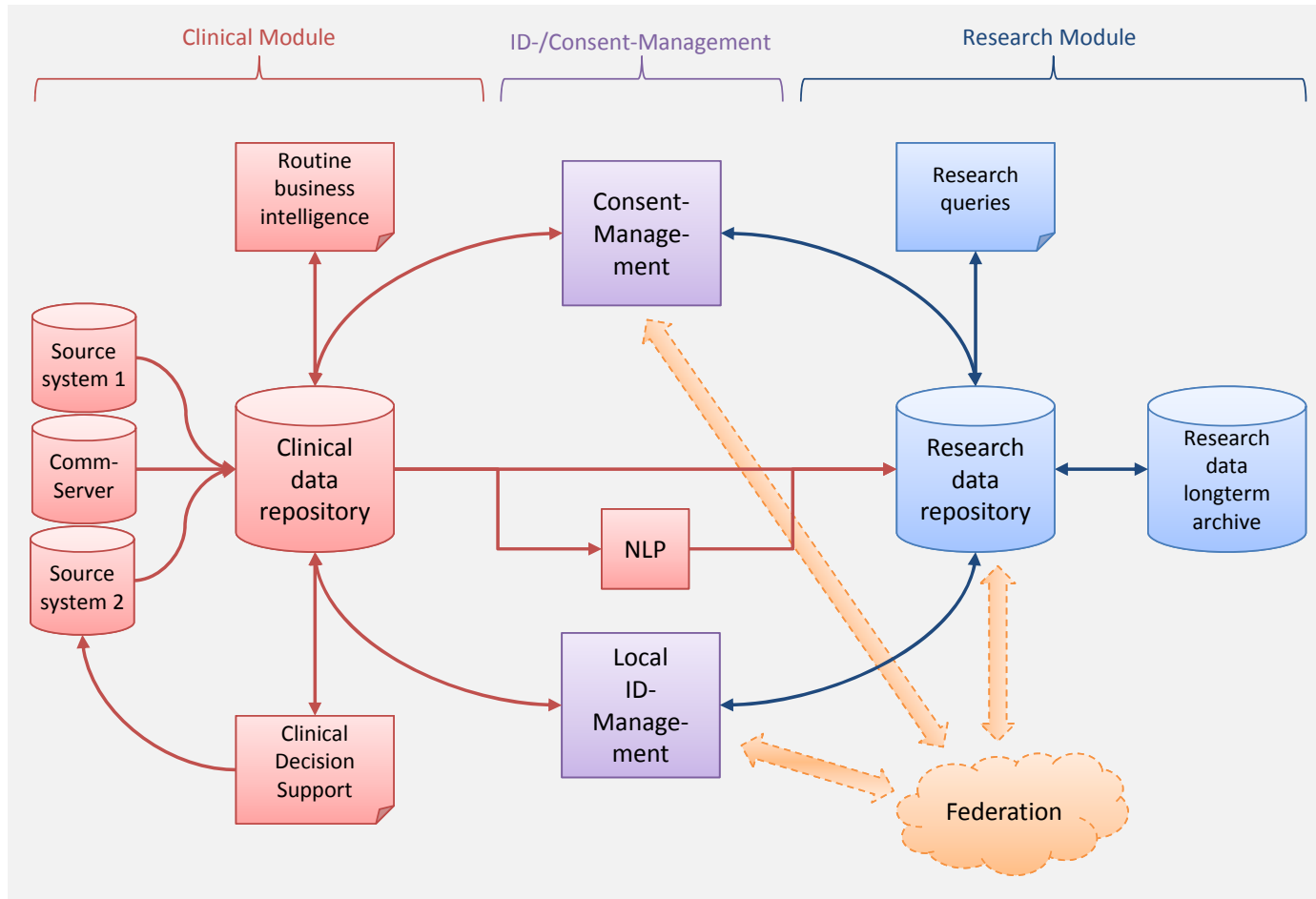
- 8 University Hospitals and Medical Faculties, 2 Universities of Applied Science, and 1 industrial partner
- across 5 German States
- associated with 4 German Health Research Networks

Comprising $\frac{1}{4}$ of all German university hospitals

Handling clinical and research data
of more than 10 million patients



MIRACUM DIC Architecture & MIRACOLIX Toolbox



**Medical Informatics
 ReusAble eCo-system of
 Open source Linkable and
 Interoperable software
 tools + X**

MIRACOLIX

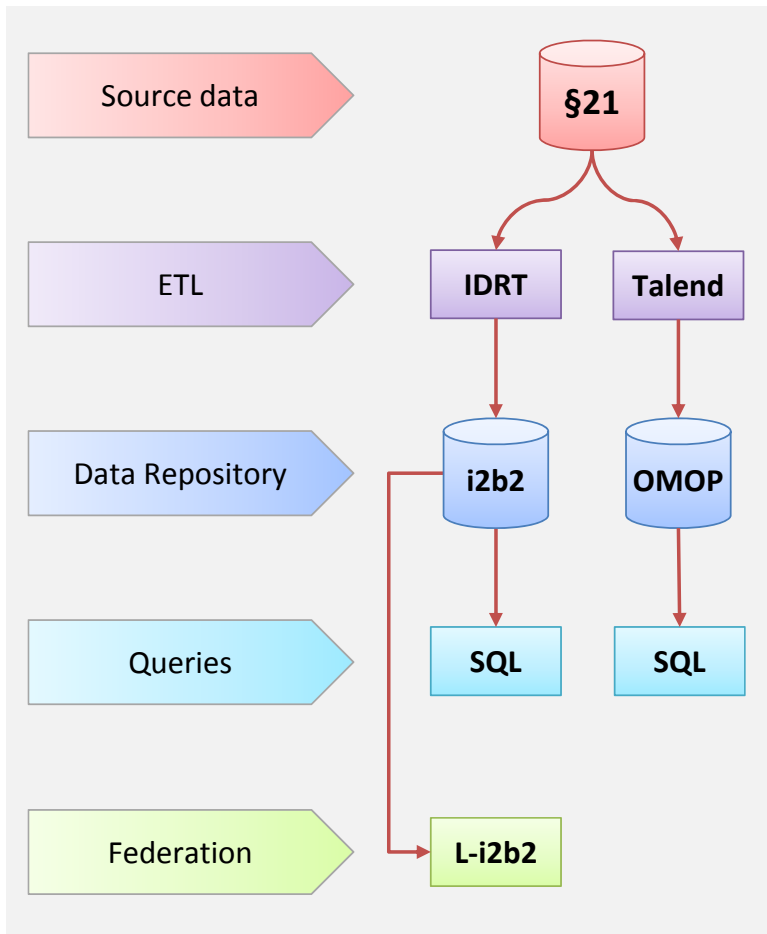
Tools: Talend, ARX, RELMA, ...

Platforms: i2b2/tranSMART,
 XNAT, ...

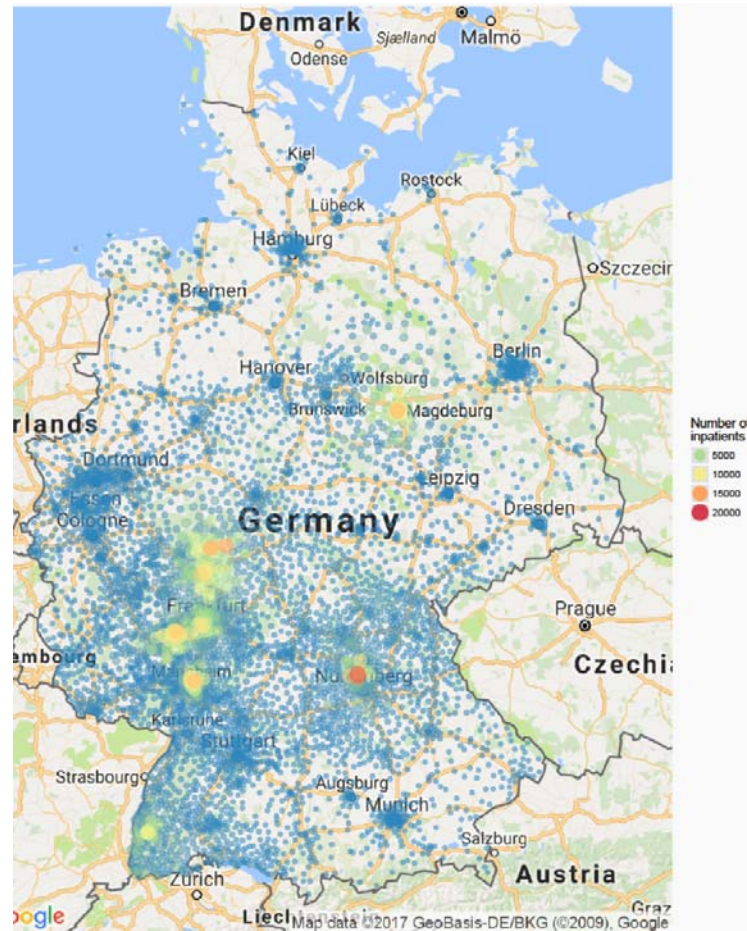
Data Models: OMOP/OHDSI

Standards: IHE, HL7 FHIR

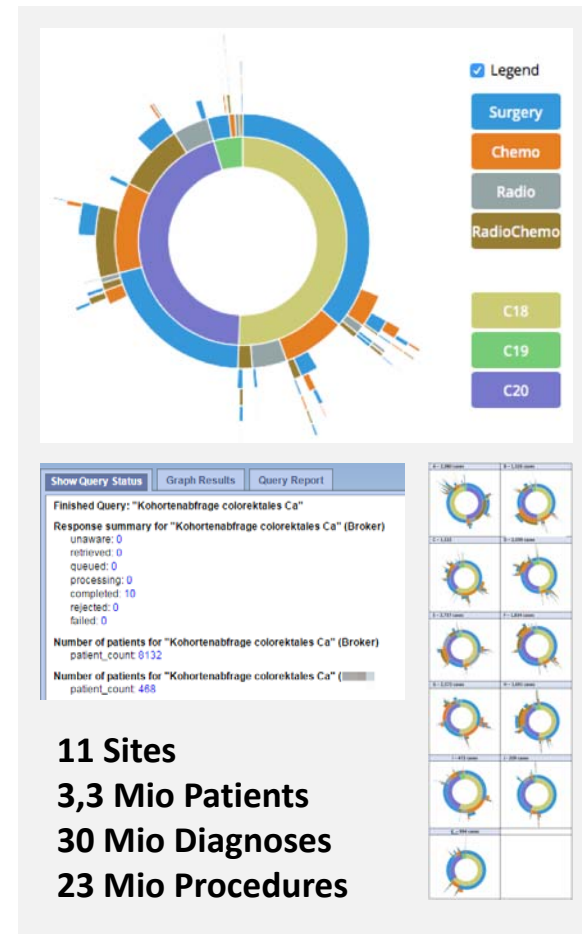
MIRACUM DIC v0.9 Pilot Integration



Pilot Architecture



Geovisualization of Catchment Area



Analysis of colorectal cancer cohort

Lessons Learned from Pilot & Outlook

Successful "Kickstarting" of MIRACUM

- rapid implementation through
 - use of established platforms
 - centralized deployment & support
- low barrier to entry due to local aggregation

Limitations

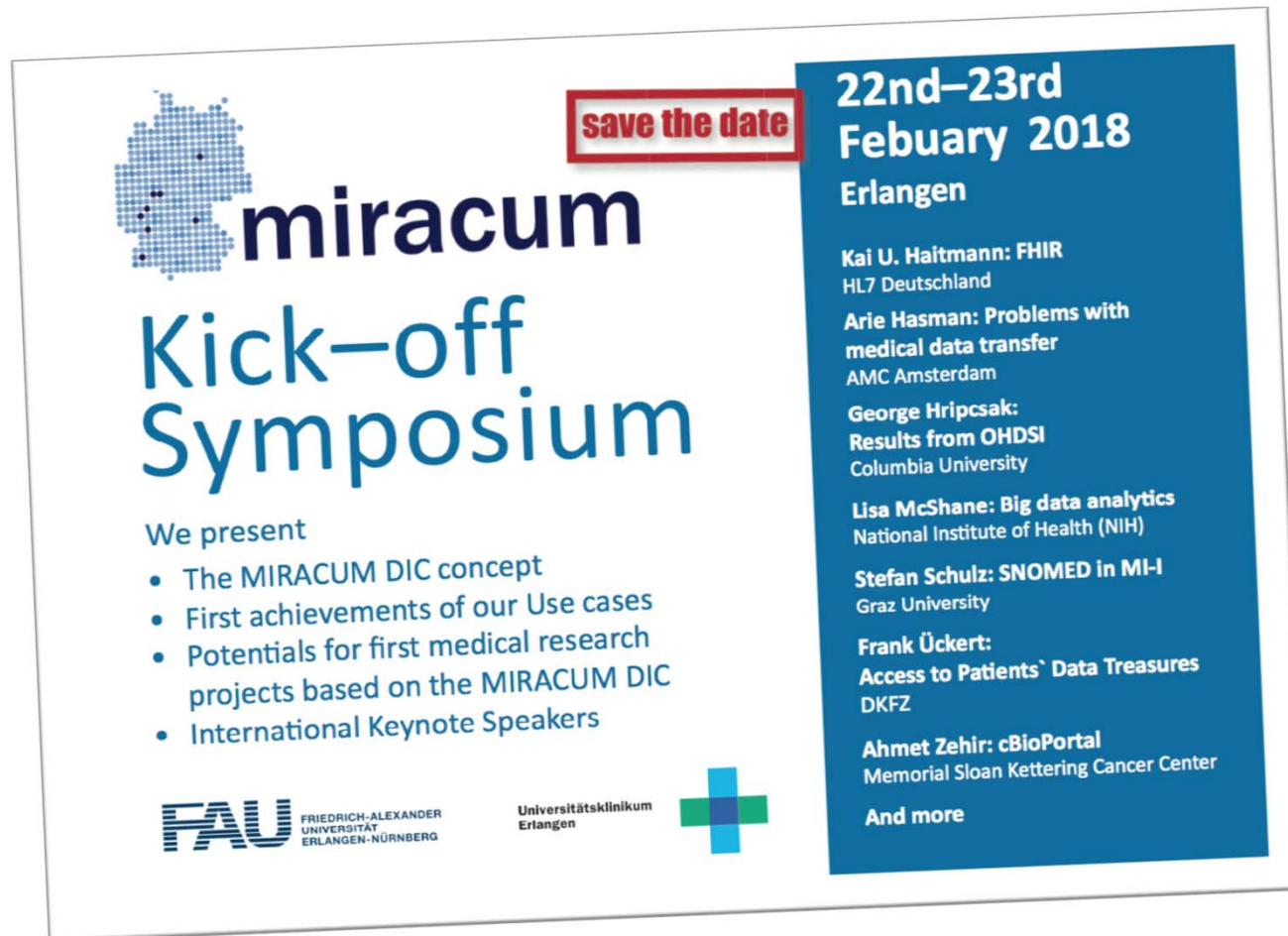
- format changes and discrepancies in §21 dataset (regardless of standardization in German law)
- "circumvented" many challenges in pilot
 - no mapping & harmonization required for §21 data => but will be for further data & international collaboration
 - data quality & validity was not assessed

The Road ahead


- focus on conversion to OMOP/OHDSI
 - schema & terminology constraints vital for cross-site/cross-consortia collaboration
 - currently lacks an international procedure terminology [available in Germany]
 - query and federation tools currently still inferior to i2b2/tranSMART
- i2b2/tranSMART remain relevant
 - support for OMICS data
 - integrated analysis functions
- experience from parallel i2b2/tranSMART/OMOP setups highly appreciated

Visit us online or in person!

www.miracum.de



save the date

 **miracum**

**Kick-off
Symposium**

We present

- The MIRACUM DIC concept
- First achievements of our Use cases
- Potentials for first medical research projects based on the MIRACUM DIC
- International Keynote Speakers

**22nd–23rd
February 2018
Erlangen**

**Kai U. Haitmann: FHIR
HL7 Deutschland**

**Arie Hasman: Problems with
medical data transfer
AMC Amsterdam**

**George Hripcsak:
Results from OHDSI
Columbia University**

**Lisa McShane: Big data analytics
National Institute of Health (NIH)**

**Stefan Schulz: SNOMED in MI-I
Graz University**


**Frank Ückert:
Access to Patients` Data Treasures
DKFZ**

**Ahmet Zehir: cBioPortal
Memorial Sloan Kettering Cancer Center**

And more

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