CHARITÉ
UNIVERSITÄTSMEDIZIN BERLIN

CLINICAL RESEARCH DATA REPOSITORY WITH SAP HANA HERUG 2016 – R-1

Michael Mallach/ Adam Low

IT Charite - Network Overview

Germany

Berlin

Campus Buch

Campus Virchow-Klinikum

Campus Charité Mitte

Campus Benjamin Franklin

CHARITÉ UNIVERSITY HOSPITAL, BERLIN

Campus Buch

Campus Virchow-Klinikum
Campus Charité Mitte

Campus Benjamin Franklin

€1.3 billion in revenues/
€158 million in outside funding

7,300 students

3,200 beds/Avg. stay: 6.4 days

3,700 doctors and researchers

740,000 cases

4 sites/607,200 m²

The Charité University Hospital Berlin is one of the largest University Hospitals in Europe.

It has a yearly revenue of 1.3 Billion Euros of which 158 million euros comes from outside funding.

There are 3,200 beds at the Charité and the average stay is 6.4 days.

There are around 3,700 doctors and researchers and around 740,000 cases per year.

The Charite is spread over 4 sites across Berlin in the center, Mitte and Virchow-Klinikum to the South, Campus Benjamin Franklin and to the North Campus Buch.

Altogether the area of the sites equals 607,200 m^2

Basic science	Gap 1	Clinical Trials	Gap 2	Improvement of public health

Systems Medicine

- Translation into better prevention, diagnosis and treatment of disease
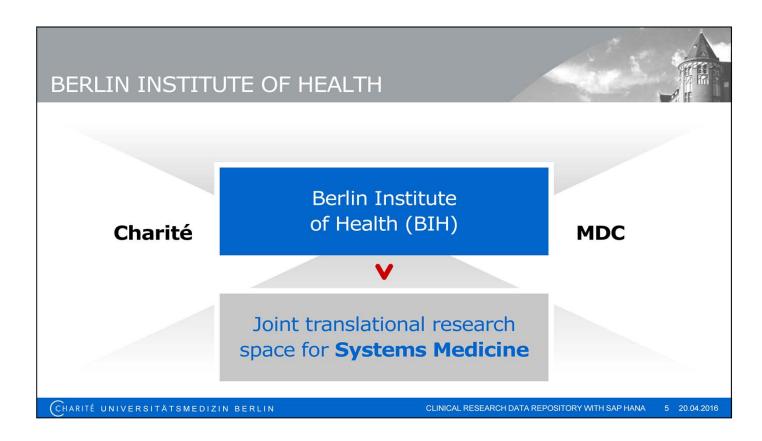- Advent of new technologies (omics, imaging, stem cells, bioinformatics etc.)

I will now present the scenario where big data is becoming both a challenge and a benefit at the Charité

Currently there are two main gaps in the translational chain between basic science to clinical trials and eventually the gap of translating the results from the clinical trials into improving public health.
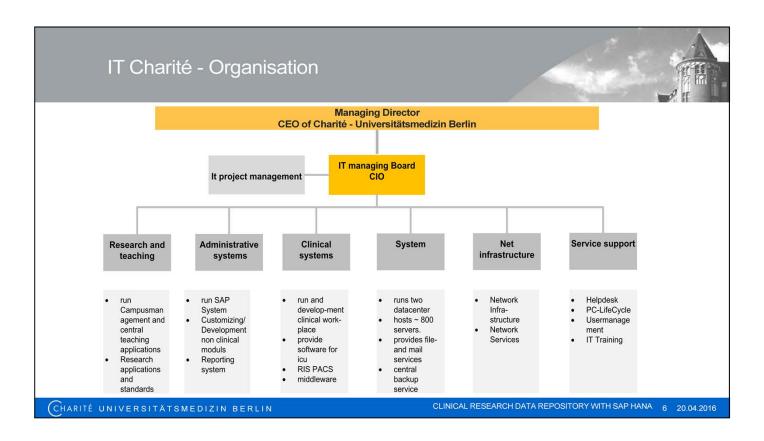
The first gap is interesting at the Charite as we have so many patients that we have a large amount of potential candidates for clinical trials.
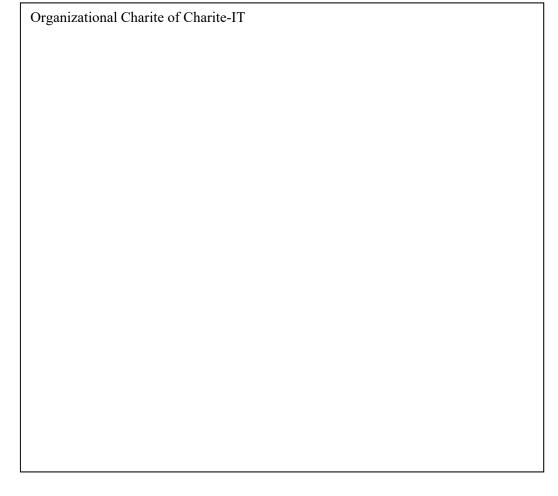
And then second gap is translating these clinical trials in to improving public health

4
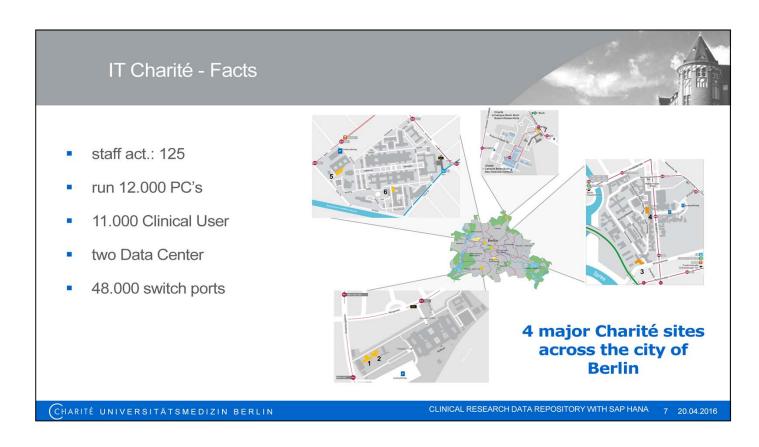
The Berlin Institute of Health (BIH) is one way of closing these two gaps.

It is the creation of a joint translational space for Systems Medicine for researchers from both the Charite and the MDC.
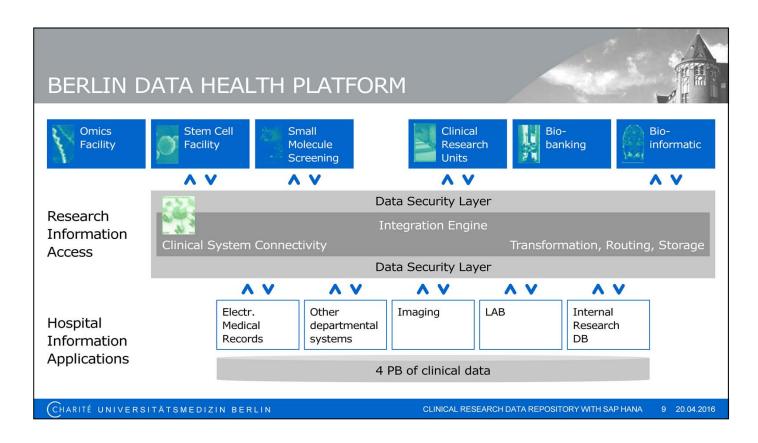
Organizational Charite of Charite-IT

IT Charité - Facts

- staff act.: 125

- run 12.000 PC's

- 11.000 Clinical User

- two Data Center

- 48.000 switch ports

4 major Charité sites across the city of Berlin

KPIs from Charité-IT

User Access InMemory Applications

Add Departmental Systems	Translational Research				Clinical Data			
Biobank	Translational Research							
Death Registry	Genome	Transcriptome	Proteome	Metabolism	Clinical	Diagnostic	Therapeutic	Pathology
Tumor Documentation								
Telemonitoring/Patient								
Medical Device Data								

Public Databases			
e.g. Druglist	e.g. Genom Atlas	e.g. PubMed	e.g. HapMap

Here is the IT architecture at the Charité which shows how all the different data repositories are all brought together in to the InMemory databases on the right hand side is the clinical data, the middle is the new data from research and the BIH and then on the left is the systems which are supported by the individual departments, such as the Bio bank and tumor documentation.
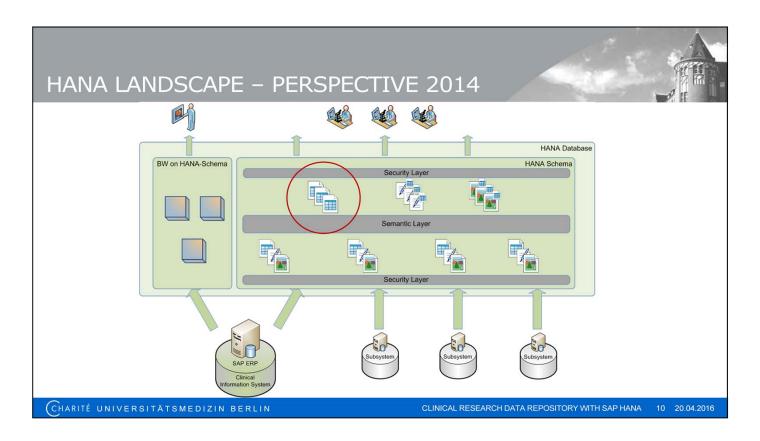
Finally the public databases are added into the InMemory database so that data from the external resources are accessible to researchers and other users of the InMemory applications

The data layer is where the data from the research groups are combined with the data from the clinical side.

This is where you can begin to see the large amounts of data that are currently held within the hospital (currently 4PB) and how this will rapidly increase when the data from the research groups are also brought into the environment.

This middle layer will also be involved in the ciphering of the data, so that data protection standards are adhered to.
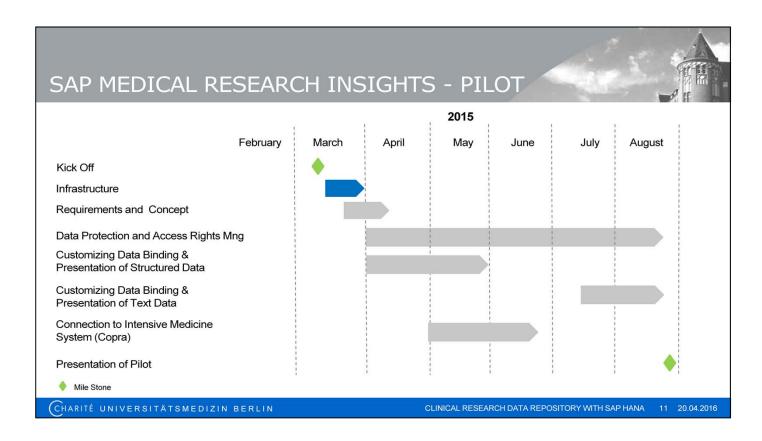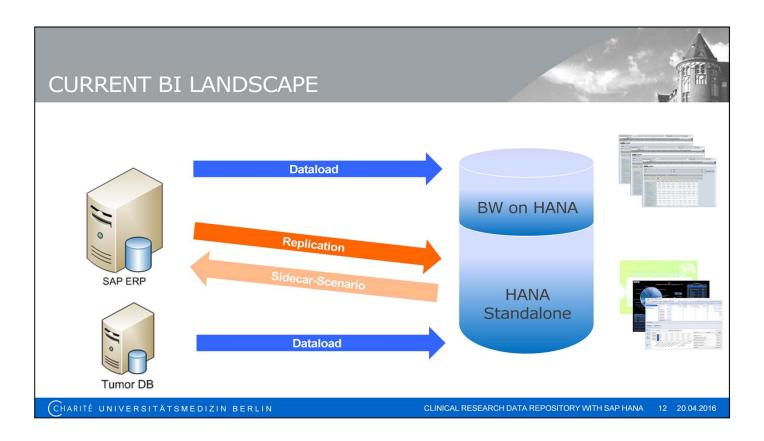
The future HANA landscape at the Charité is that as well as having a BW on HANA schema there will also be another schema for the medical information gateway.

This schema will bring together data from SAP ERP and also the other subsystems we use e.g the tumor DB and the bone bank.

The data will go through a security level where the data is anonymised and then it will be semantically analyzed through implementations such as ones that will be described in the following slides.

This slides leads into talking about MRI and using the road map as a guide

A tool for researchers to find particular groups of patients for studies

Based on SAP HANA technologies, with the goal of providing BI like tools for medical researchers

Dataload

BW on HANA

Replication

Sidecar-Scenario

HANA Standalone

SAP ERP

Dataload

Tumor DB
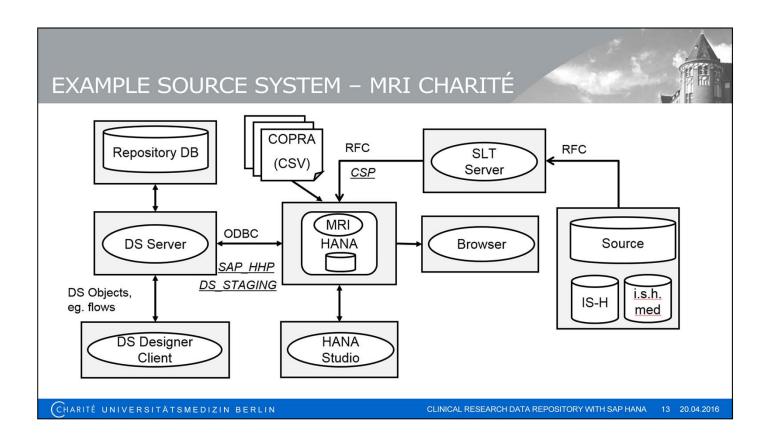
Sidecar scenarios allow for much quicker solutions without completely changing our BI landscape e.g
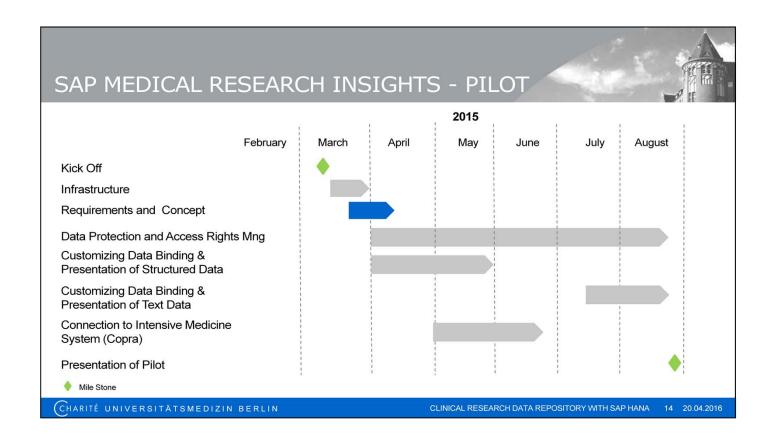
Sidecar-Scenario → Search in 493Mio Datasets → Oracle DB 17,5 hours → SAP HANA DB 5sec
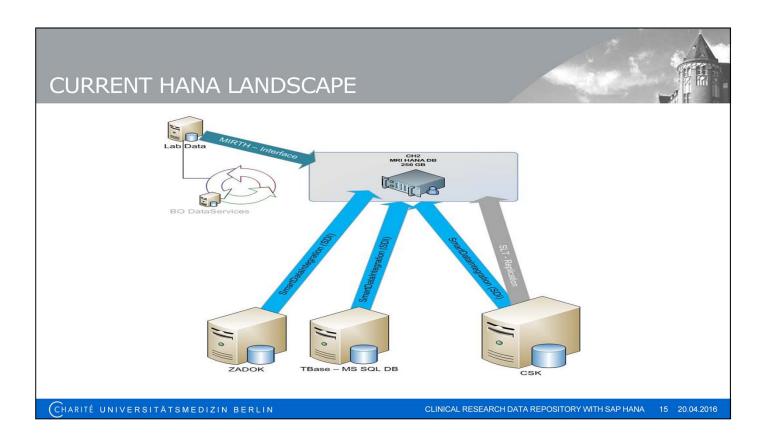
Example via Transaction SE16H:

-like SE16 but much better →selection on all Fields, multiselection, output in ALV

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Data loading from TBASE into HANA

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CURRENT HANA LANDSCAPE

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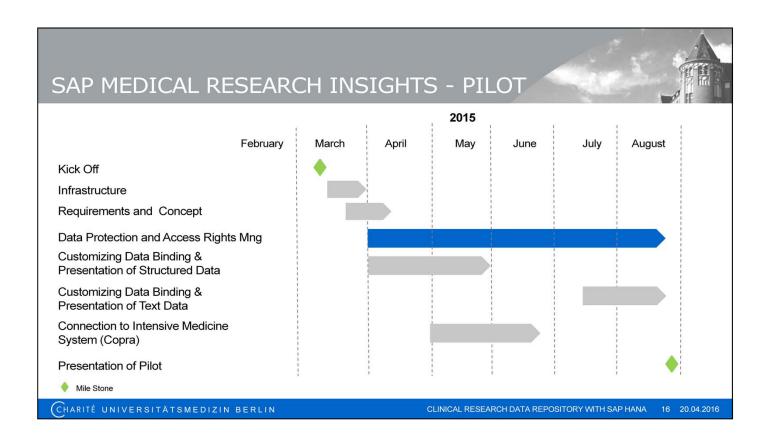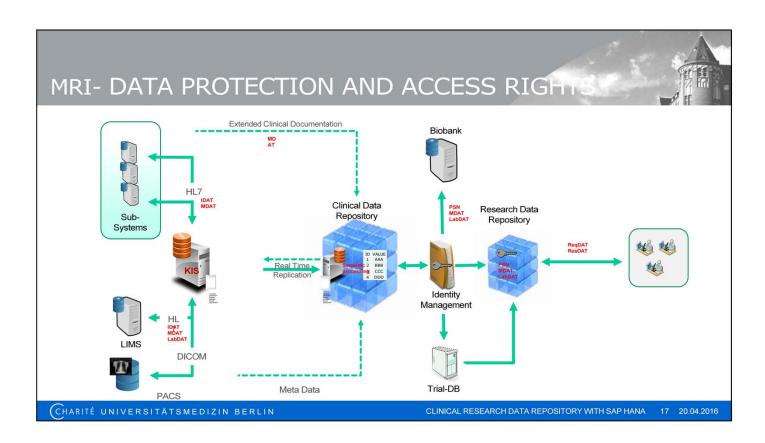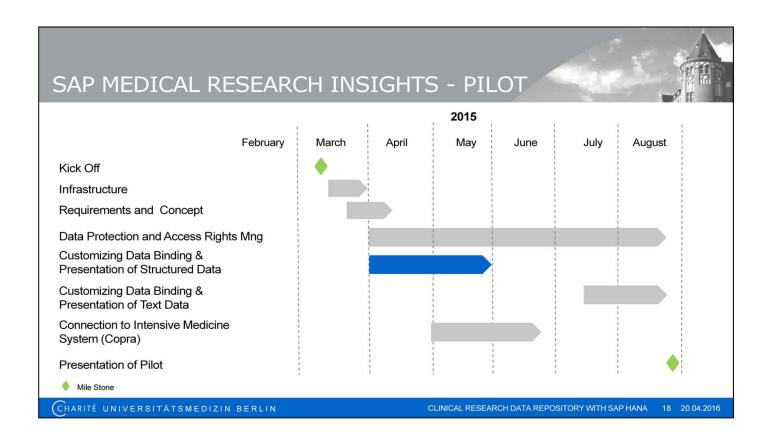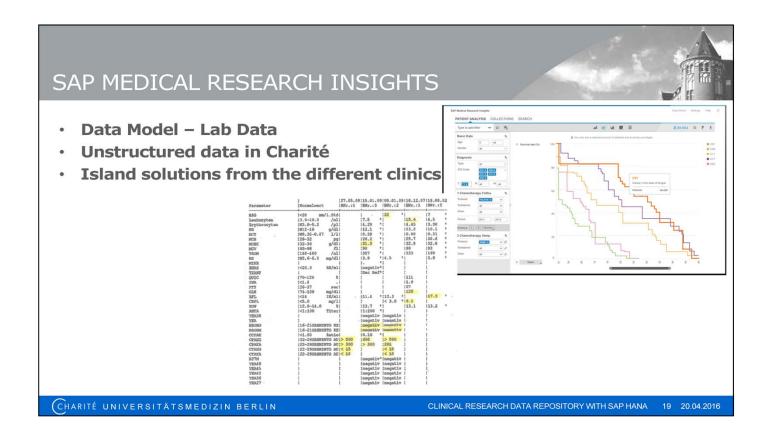
Data loading from TBASE into HANA project 65
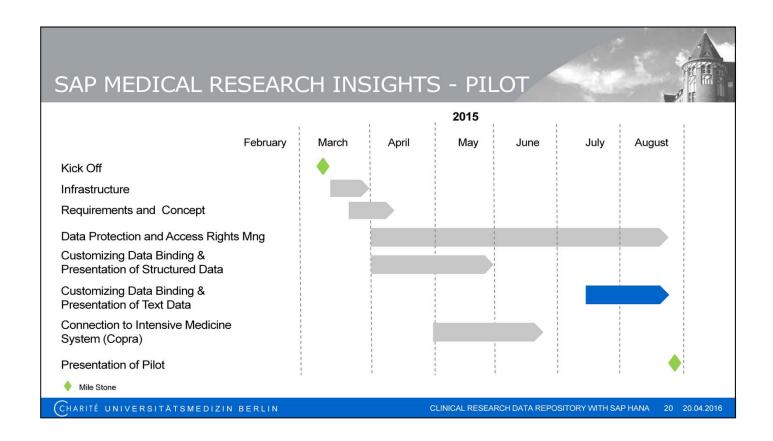
Health Level-7 or **HL7** refers to a set of international standards for transfer of clinical and administrative data between software applications used by various healthcare providers. These standards focus on the application layer, which is "layer 7" in the OSI model.

SAP MEDICAL RESEARCH INSIGHTS - PILOT

2015

	February	March	April	May	June	July	August
Kick Off							
Infrastructure							
Requirements and Concept							
Data Protection and Access Rights Mng							
Customizing Data Binding & Presentation of Structured Data							
Customizing Data Binding & Presentation of Text Data							
Connection to Intensive Medicine System (Copra)							
Presentation of Pilot							

◆ Mile Stone

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MRI- DATA PROTECTION AND ACCESS RIGHTS

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This slide presents how this implementation would work for a searching for candidates in a clinical trial. The data is drawn from the different sources and then certain inclusion or exclusion criteria are added and the patients are presented to the researcher

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- **Evaluation of MRI 2.0 and foundation for health**
- **MRI 2.0 with Genome Mapping**
  - see video from youtube: https://www.youtube.com/watch?v=6vYg2u6wvOQ

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OUTLOOK

Cooperation with SAP

Customer Relationship
Software, Licenses, Service
- Human Resources
- Selfservices / Talent-management
- Qualification /Recruiting
- Risk management
- Maintenance
- Identity-Management

Pilot Projects
„first time in Clinic"
- Immobilienmanagement incl. Energy (SmartGrid)
- Predictive Analysis (BI Analytics)
- Mobile Solution → EMR
- Datenbase Migration from Oracle

Development Cooperation
Product development e.g. PPP
- Medical Explorer
- Development on HANA (BIG DATA)
- Trial Software „ALMANACH
- Development of mobile solutions for clinical use
- …

Based on RFP's etc.   **Based on Collaboration Agreement**

THANK YOU!

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