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

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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 m².
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 into improving public health.
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 Chart of Charite-IT

- Research and teaching
  - Run Campus management and central teaching applications
  - Research applications and standards
- Administrative systems
  - Run SAP System
  - Customizing/Development of non-clinical modules
  - Reporting system
- Clinical systems
  - Run and development of clinical workplace
  - Provides software for ICU
  - RIS PACS
  - Middleware
- System
  - Runs two datacenters
  - Hosts ~800 servers
  - Provides file and mail services
  - Central backup service
- Network infrastructure
  - Network infrastructure
  - Network services
- Service support
  - Helpdesk
  - PC LifeCycle
  - User management
  - IT training
KPIs from Charité-IT

- staff act.: 125
- run 12,000 PC’s
- 11,000 Clinical User
- two Data Center
- 48,000 switch ports
Here is the IT architecture at the Charité which shows how all the different data repositories are all brought together into 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
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
Data loading from TBASE into HANA
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
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.
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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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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
- Database Migration from Oracle

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

Based on RFP’s etc.
Based on Collaboration Agreement
THANK YOU!

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