

EUROPE BIOBANK WEEK

SEPTEMBER 13-16, 2016
VIENNA - AUSTRIA

Clemens Suter-Crazzolara: "Big data analytics of medical data - contributions from industry experts"



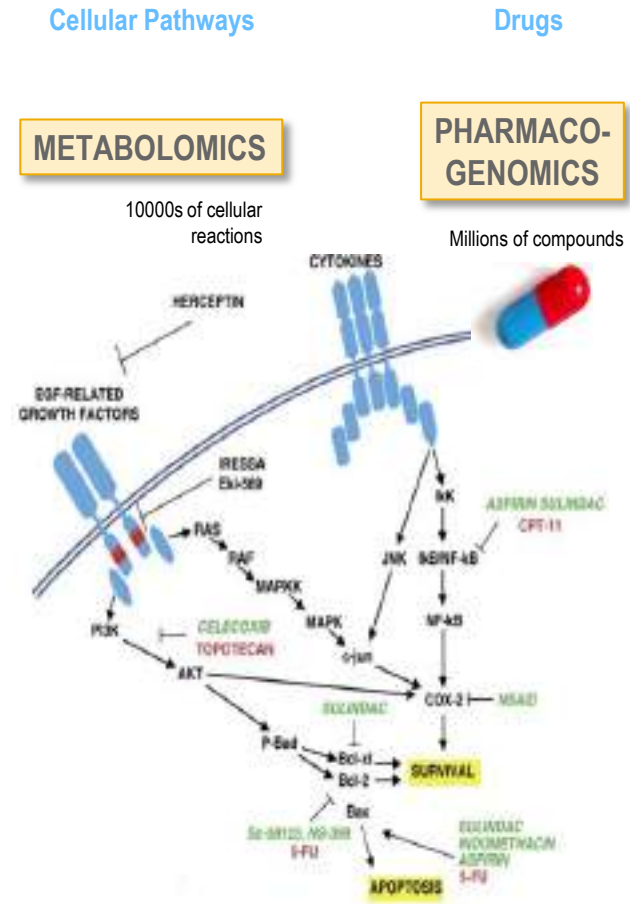
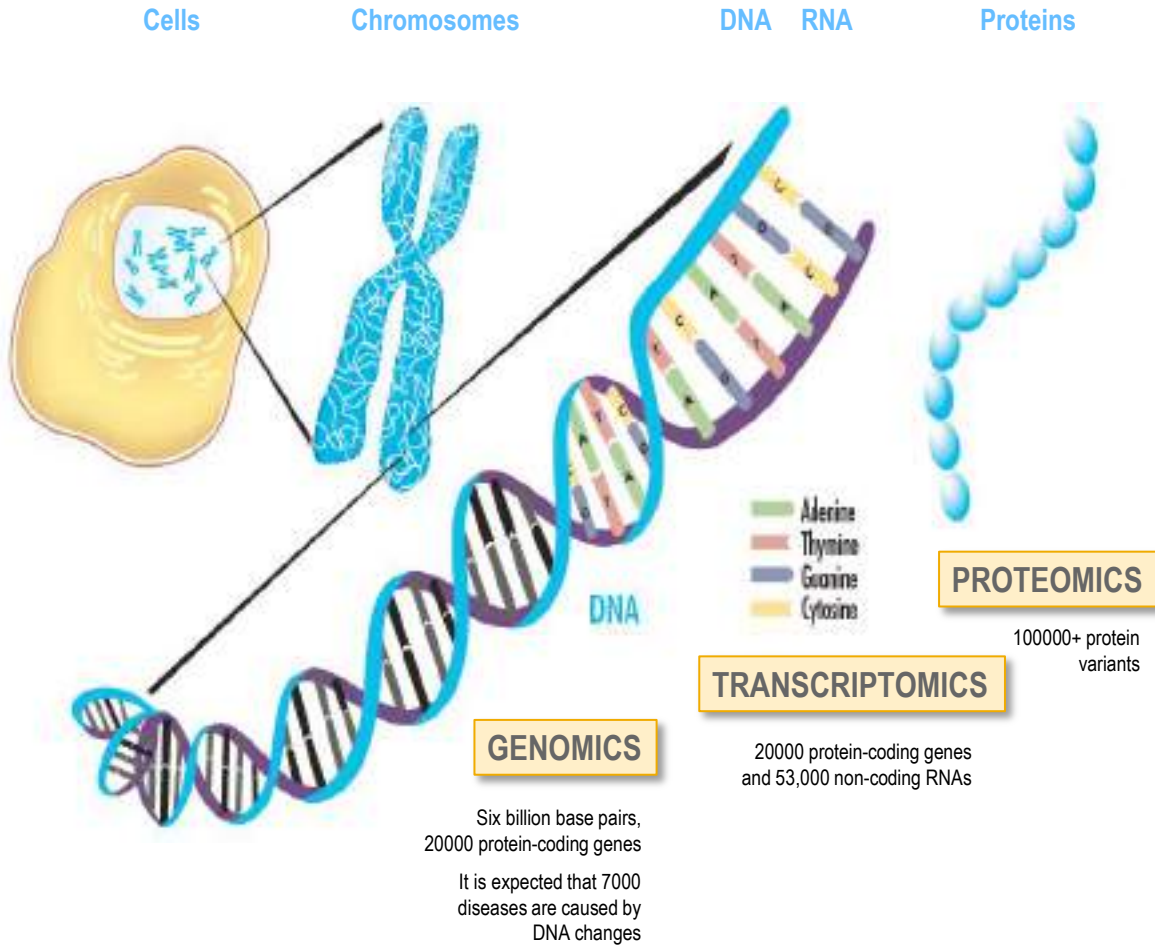
www.europebiobankweek.eu

Big Data Analytics of Medical Information

Dr. Clemens Suter-Crazzolara, SAP SE
July, 2016



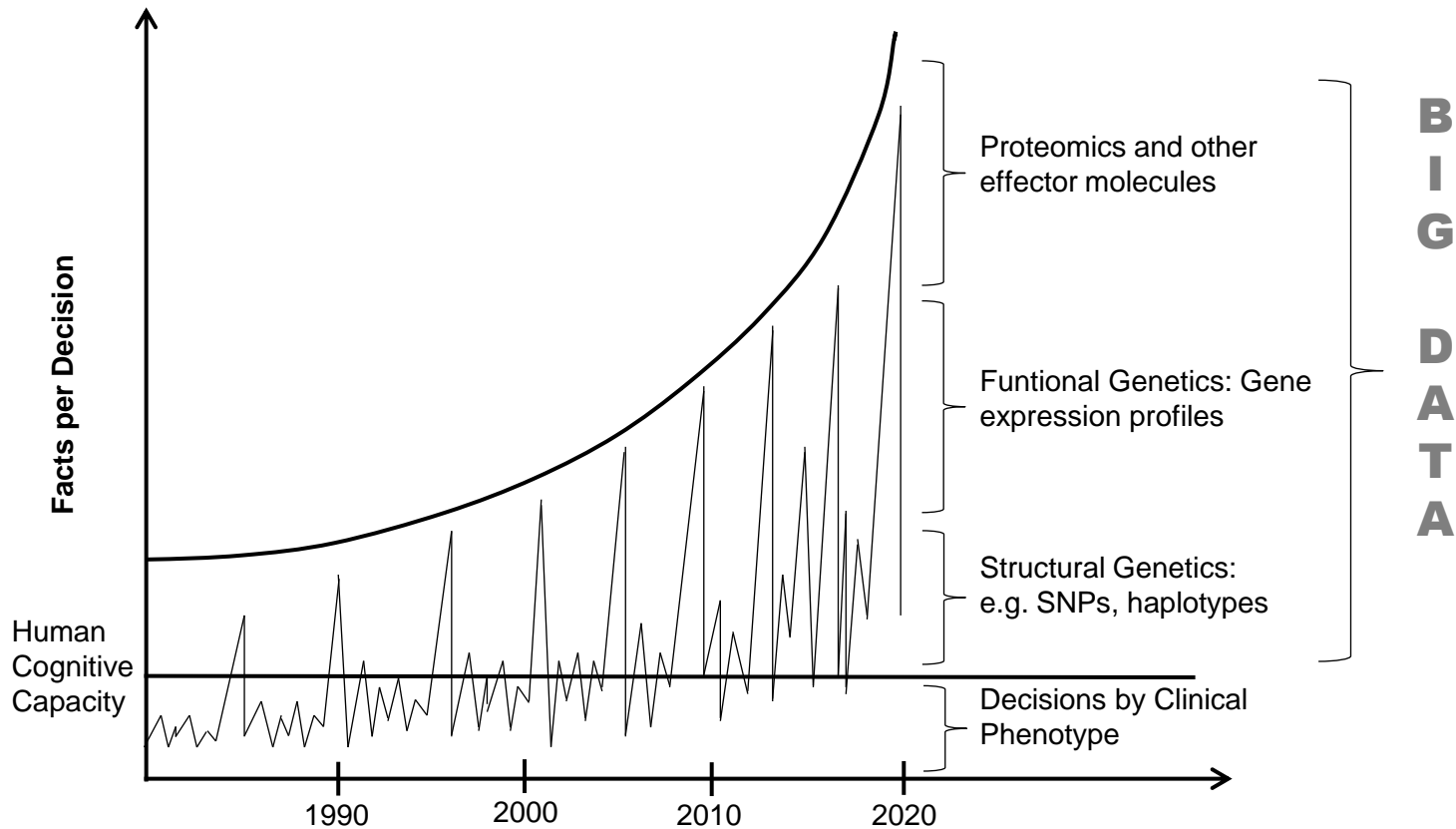
Challenge - from Genomes, to Diseases, to Drugs



Amount of Data and Value of Information



Challenge – Decision Making in the Context of Abundant Data

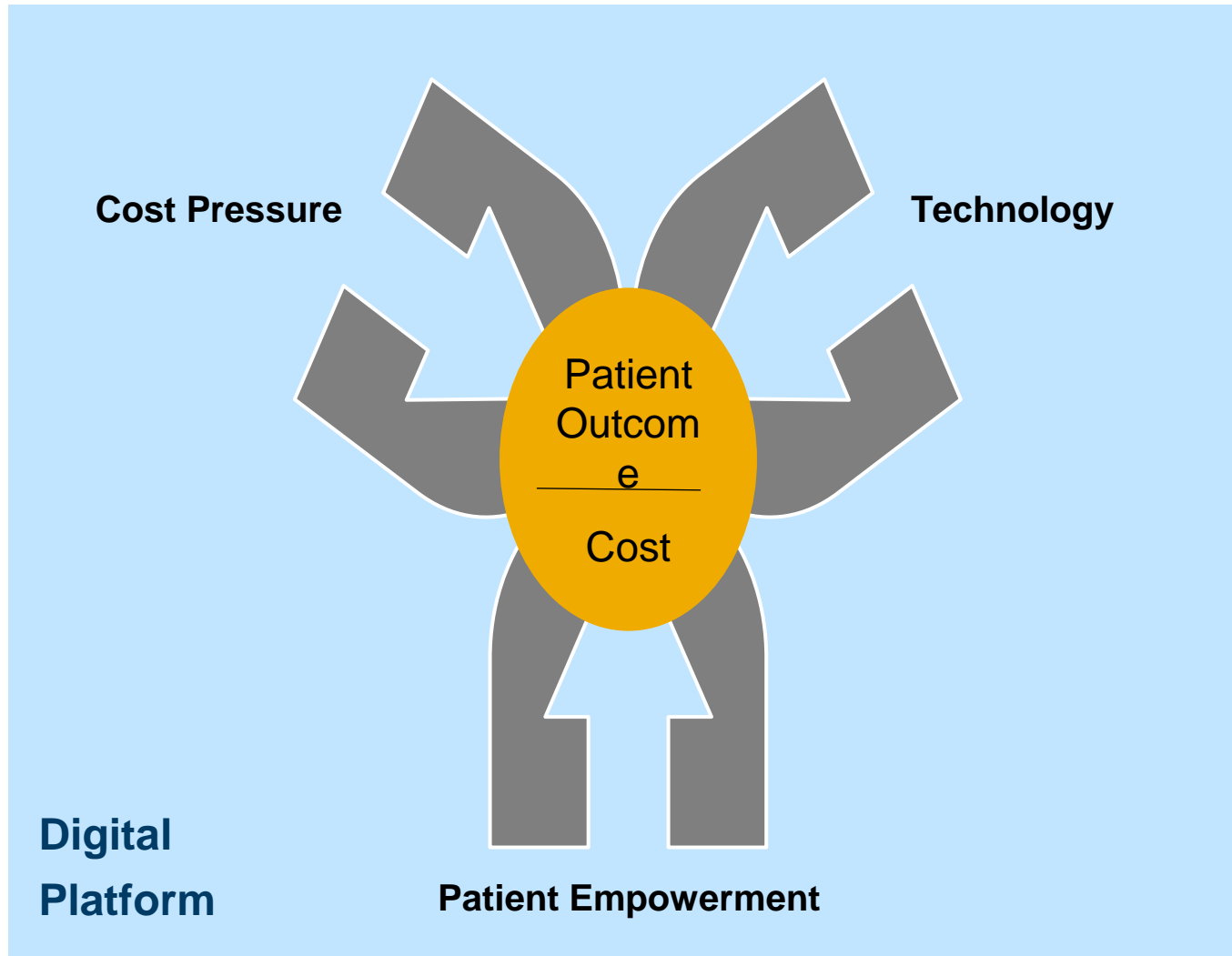


Source: The Strategic Application of Information Technology in Health Care Organizations (Third Edition 2011) by John P. Glaser and Claudia Salzberg

Unprecedented need for Decision Support will drive the need for Clinical Warehouses

Enter: Precision Medicine

Unique market forces drive the creation of a digital platform

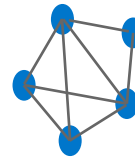
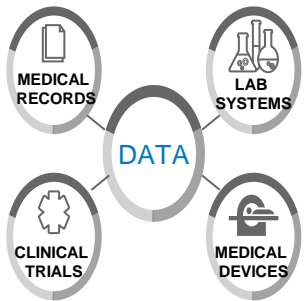


SAP Connected Health platform

Applications and Services



Toolkits

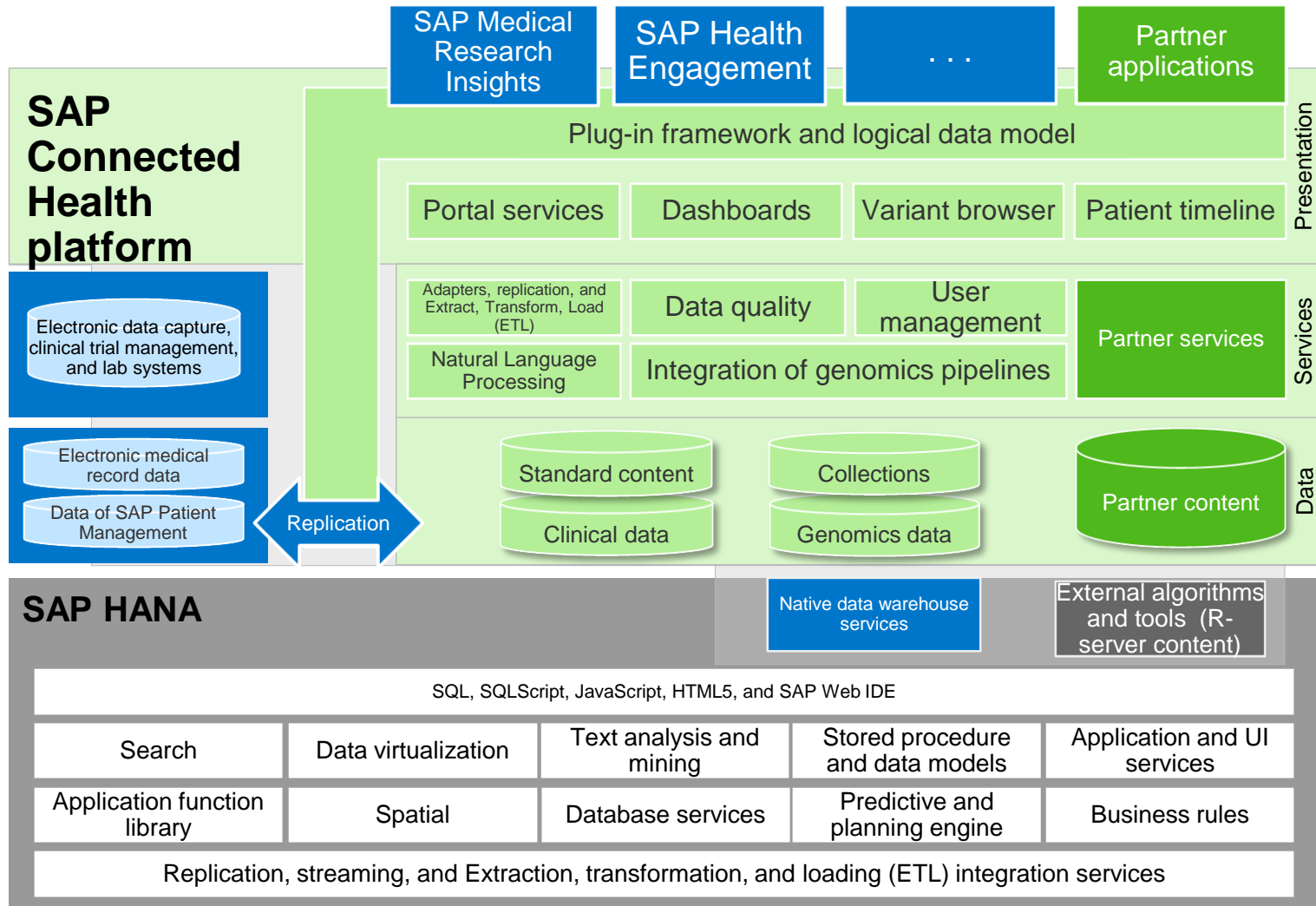


SAP HANA



SAP Connected Health platform

All your content in one place; analyzed in real-time through 21st century analytics



SAP & Stanford – High speed analytics at work

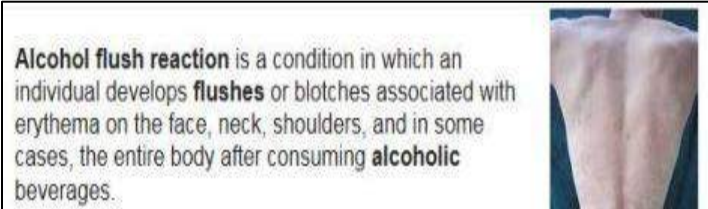
Find associations between genetics, health & disease in large cohorts



Carlos D. Bustamante
Professor, Department of Genetics,
Stanford University, Inaugural Chair,
Stanford Biomedical Data Science
Department



**Euan A. Ashley MRCP
Dphil,**
Clinician & Director, Stanford Center
for Inherited Cardiovascular
Disease; Director, Stanford Clinical
Genomics Service

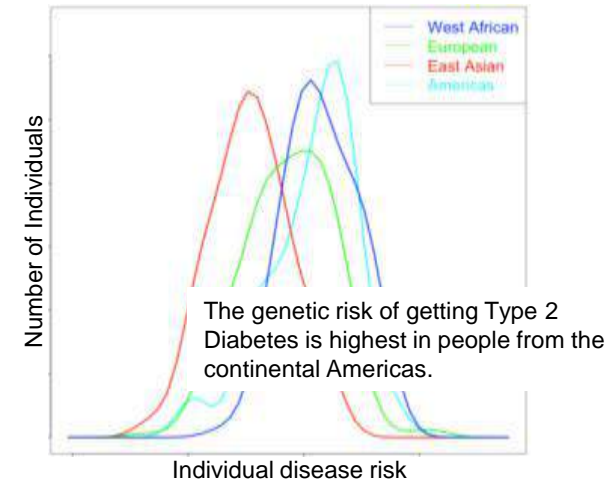


Alcohol flush reaction is a condition in which an individual develops **flushes** or blotches associated with erythema on the face, neck, shoulders, and in some cases, the entire body after consuming **alcoholic** beverages.

Single Nucleotide Polymorphism in ALDH2 (12p24.2). Population analysis of integrated annotation data across 2504 individuals: 2.1 TB of data, 212 billion rows
→ Time needed: 2.5 seconds

Type II Diabetes genetic risk

- 1000 Genomes Project, 629 Genomes, 125 associated with T2D; corroborates a study from 2012 published in PLoS Genetics with 12 SNPs across 49 individuals; 136 billion records 1.2TB
- Reproducing these results without SAP HANA not feasible due to manual overhead

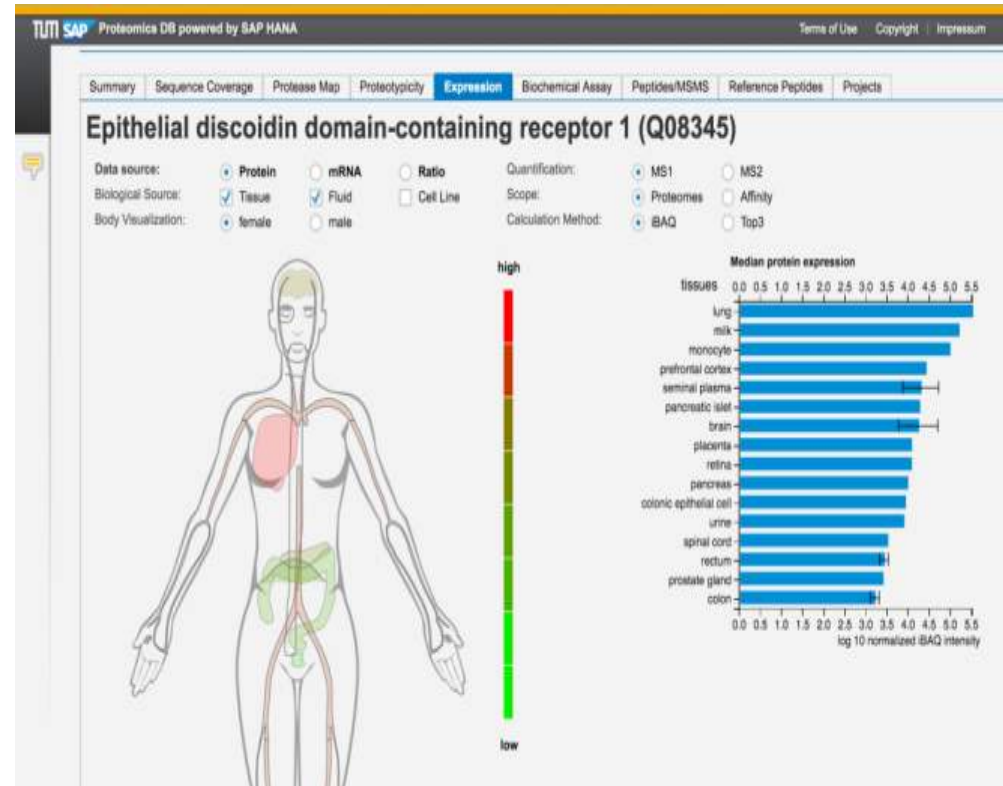


Preliminary Results. Winston Haynes and Atul Butte (Stanford). Anja Bog, Enakshi Singh, Srin Kumar, and Kannan Avudai (SAP).

Proteomics DB <https://www.proteomicsdb.org>

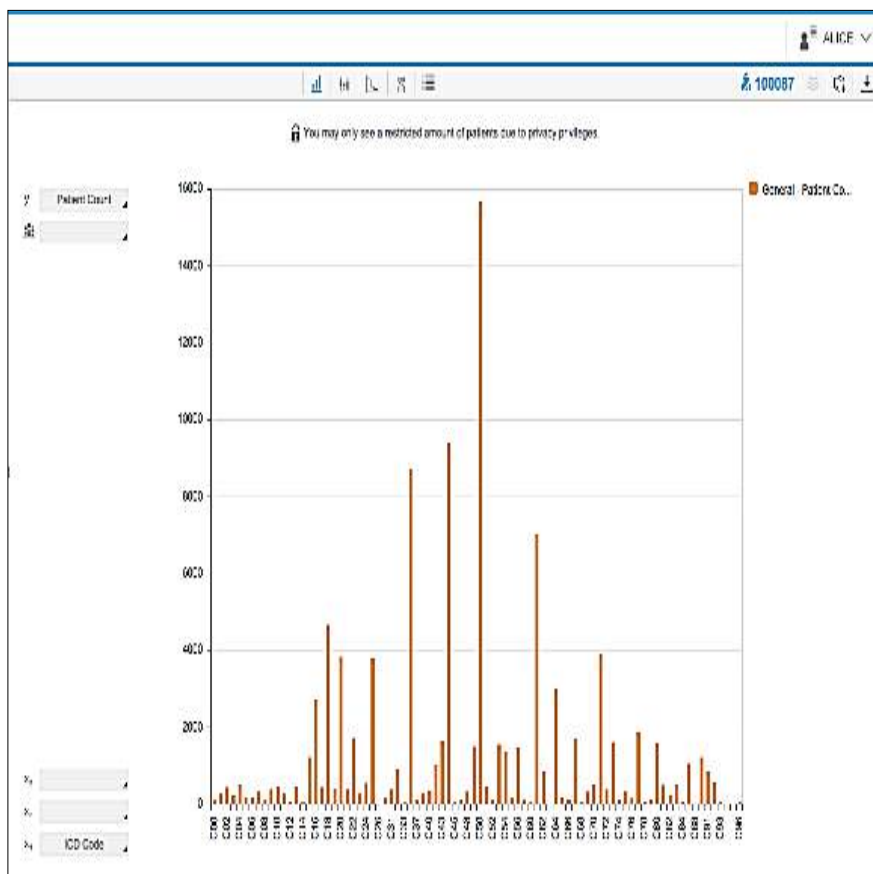
Browsing and analyze proteome data

- Offers a complete map of human proteins (proteome) to improve the understanding of physiological processes
- A public, free-of-charge platform powered by SAP HANA managing terra-bytes of human proteomics data
- Published in **Nature** May 2014 (selected as cover story)
- Collaboration with TU München, JPT, Cellzome
- 2015 release added experimental planning, drug potency analysis, experiment planning



Cohort analysis with SAP Medical Research Insights

Secure application to understand, predict, and decide



- **Analyze data and run scenarios for hypotheses building and validation:** shape (pre)clinical studies and delivery of new drugs, devices, and care



- **Analysis of Big Data:** Structured and unstructured data, including omics data; in real time through user-friendly interface
- **Real-world data analysis:** Capture and explore longitudinal patient data with real-world evidence
- **Ad hoc reporting:** Harmonization of data from many sources and representation with easy visualization

Customer Case: American Society of Clinical Oncology

CancerLinQ Is Based on SAP Technology



- Clinical decision support for 40000+ oncologists globally, to improve patient outcomes
- A real-time big data analytics platform to incorporate patient cohorts with many data fields
- Actively extended with functionality needed by the customer
- Fast, reliable cloud solution
- Allows oncologists to learn and collaborate
- Surprising, novel insights

1 million patient records from 60+ practices (mid 2016)

Customer Example: Roche Diagnostics

see http://www.sap.com/customer-testimonials/healthcare/roche_diagnostics.html



Customer Journey: Roche Diagnostics

[Customer Snapshot](#) »

[Success Strategy](#) »

[The Challenge](#) »

[Enter SAP](#) »

[Better Business](#) »

[Benefits](#) »

[Journey Ahead](#) »

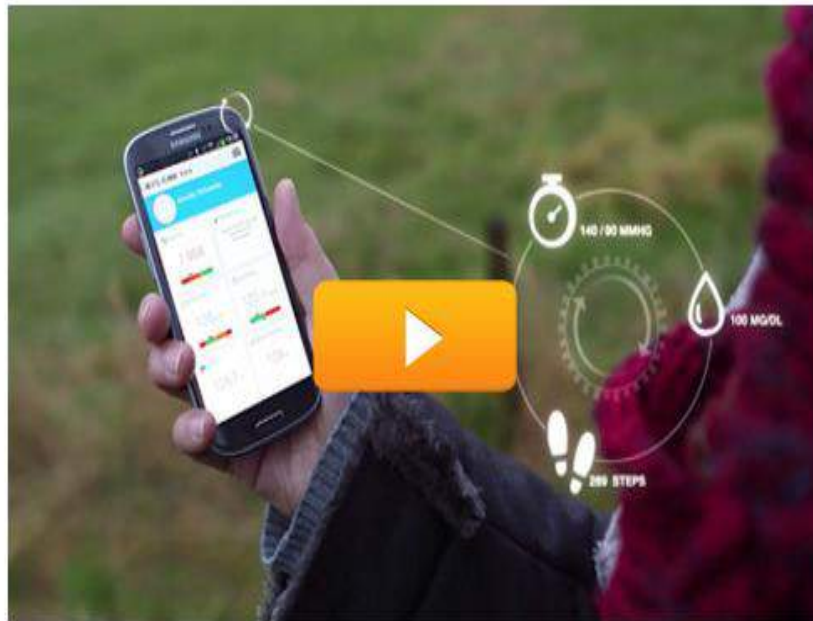
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Explore how other customers are generating value with SAP technology.

[More customer stories](#) »

Enter SAP

Where there's a mobile app, there's a prevention



What makes this unique

Called Accu-ChekView, Roche's new package combines a blood glucose monitor, a wearable fitness tracker, and an App developed by SAP that are integrated together. Specifically targeted to meet the individual needs of patients and doctors, now a patient's vital signs and blood sugar level can be watched in relation to their physical activity level, in real-time. The doctor can monitor the patient remotely, and the patient can communicate with the doctor's office.

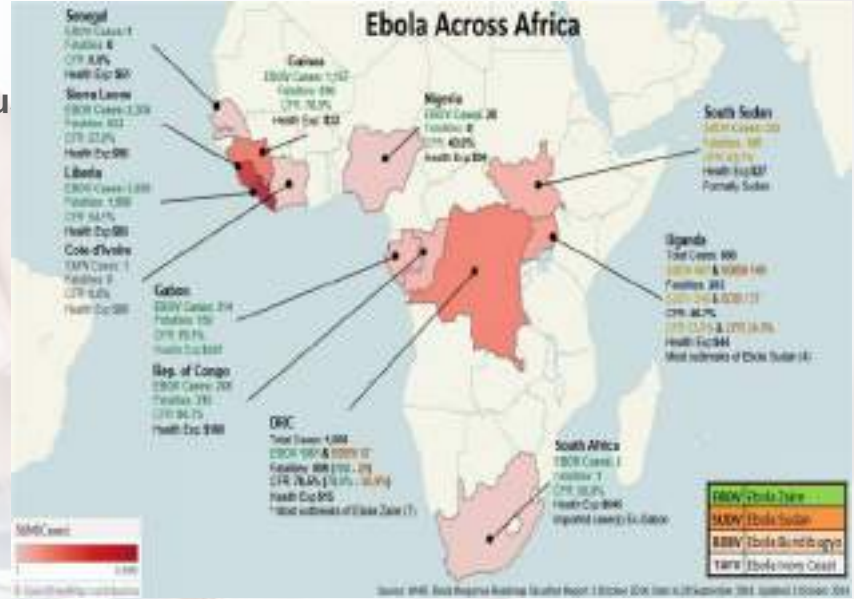
Customer Example

Sormas



A Management Tool for Containing Infectious Disease Outbreaks

- All in-take done on in-field mobile devices that can work off-line when needed
- Real time visualization of outbreaks
- Allows immediate response with right resources at the right locations
- Leverages several engines in HANA



Economic Impact

- Lower number of workers infected, more of the population live through event
- Can provide up-to-date facts on where outbreak is occurring
- Targeted response teams can reduce spread of disease early on with less resources
- WHO and NGOs can see when extra resources and funding are needed in real-time
- Transparency of outbreak available to Ministry Heads to speed decisions on

- Developed by simplifying processes to manage outbreak of Ebola.
- Added Cholera, Measles and H5N1 (Avian flu).



The SAP Strategy in Precision Medicine

SAP Connected Health network



The SAP logo is located in the top left corner of the image. It consists of the letters 'SAP' in a bold, white, sans-serif font, set against a blue background that is a right-angled triangle pointing towards the top right. A small registered trademark symbol (®) is positioned to the right of the letters.

SAP

®

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Connected Health

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