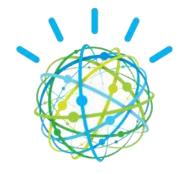




## **IBM Watson's Next Step: Health**

All About the Data
January 21<sup>st</sup> 2016, Groningen



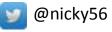




## **Introduction speaker**













44 zettabytes

### Data is growing exponentially

It demands new approaches in both technology and strategy

Non-standardized data and numbers, free text, speech, video, images, pictures, ... 80% unstructured data We are here 20% structured data

Numbers (birth date, lab values, days in hospital, financial, ...), spreadsheets, standardized data or datamodels (SNOMED, LOINC, ICD-9, DICOM, ...), etc...





### Healthcare and Lifesciences professionals are suffering from Infobesity



- Medical information doubles every 5 years. By 2020 it is expected to double every quarter.
- 80% of the healthcare professionals spends at most 5 hrs/month to keep abreast of his/her domain
- 80% of the information is unstructured
- Only 20% of the knowledge doctors use is evidence based: 1 out of 5 diagnoses are wrong or incomplete.

### **IBM Watson**





# Big Data & Analytics

Data Mining, Optimization, Text Analytics



# Artificial Intelligence

Machine Learning, Natural Language Processing, Algorithms & Theory



# **Cognitive Experience**

HCI, Speech, Translation, Machine Vision, Visualization



# **Cognitive Knowledge**

Knowledge Representation, Ontologies, Semantics, Context



## **Computing Infrastructure**

High Performance Computing, Distributed Systems, Programming Models & Tools



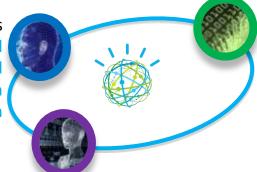






### Watson is an example of cognitive computing

1 Understands natural language and human speech



2 Generates and evaluates hypothesis for better outcomes

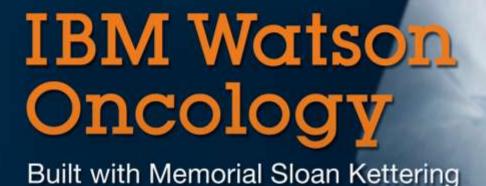


3 Adapts and Learns from user selections and responses



## Watson wins Jeopardy – February 2011









### **Watson Cognitive in Medicine**





### **Ongoing Training Partner**



Memorial Sloan Kettering Cancer Center..

Watson for Oncology, trained by Memorial Sloan Kettering available in clinical use in lung, breast, colon and rectal cancer



### Bumrungrad International Hospital

5 year agreement for Watson for Oncology



Making Cancer History

### **MD** Anderson

Introduced proprietary solution with Watson for clinical use for Leukemia and Molecular Targeted Therapies



### **Mayo Clinic**

Completed testing with Clinical Trial Matching for lung, breast, colon and rectal cancer



### **Baylor College of Medicine** *Published results of use with*

Published results of use with Watson Discovery Advisor – identified 7 targets for P53 activation within weeks



### **Watson Genomics Advisor**

Secured 13 Cancer and academic medical centers for beta testing



### Department of Veterans Affairs

Selected Watson to analyze EMRs in a demo project



### **Mayo Clinic**

Selected Watson to analyze EMRs for Clinical Efficiency and Effectiveness Program



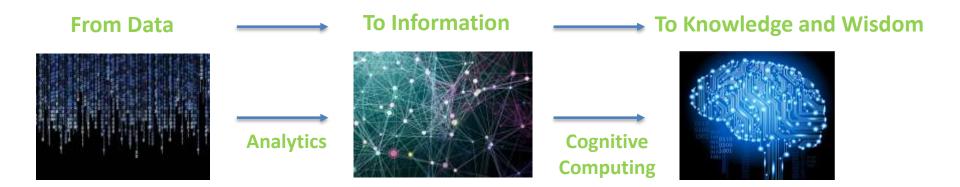
### **Manipal Hospitals**

Selected Watson for Oncology to identify evidence-based treatment options among 200.000 patients/year.





## Watson helps healthcare professionals

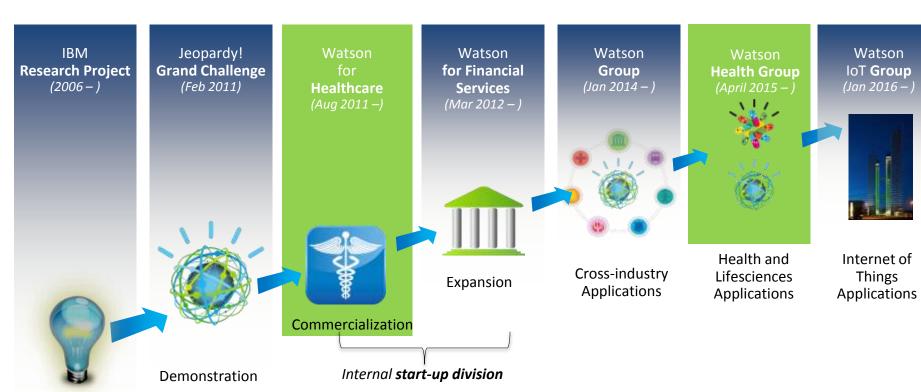


Observe --> Interpret --> Evaluate --> Decide





### **Brief history of IBM Watson**



R&D



### IBM.

## When was this invented?







### IBM.

### Wearables





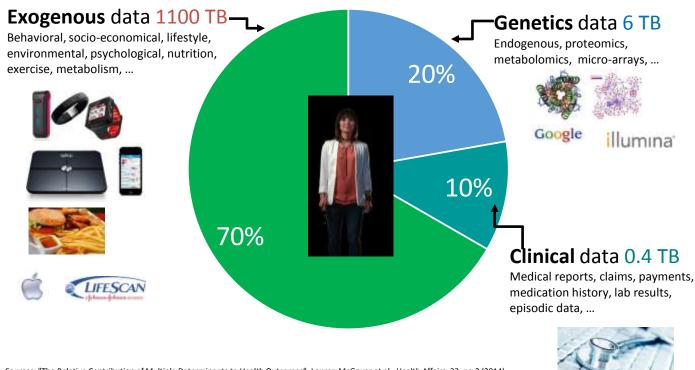


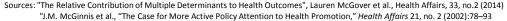




### Determinants of health – the holistic view

During our lifetime



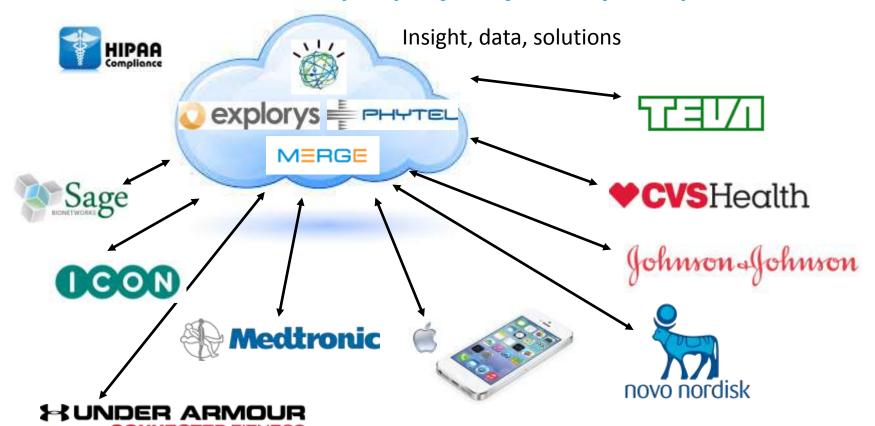








### IBM Watson Health – an open platform for ecosystem partners







## **Crowd-sourced personalization of health and wellness**





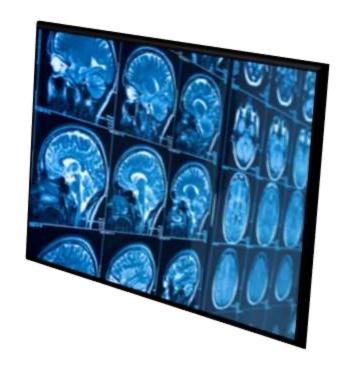




### Watson gains ability to "see"

Acquisition of Merge Healthcare, on October 13<sup>th</sup> 2015

- Planned acquisition of Merge brings 7500 new healthcare sites along with a growing body of medical images to Watson Health.
- The IBM vision is that organizations could integrate medical images with other sources of health data to generate new insights to help physicians with optimal, more personalized patient care decisions.







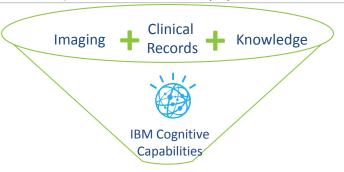


# Applying cognitive tools to medical imaging will help assist medical experts

Current diagnosis based on imaging alone or with limited context



IBM combines multiple data sources and cognitive capabilities to assist the physician



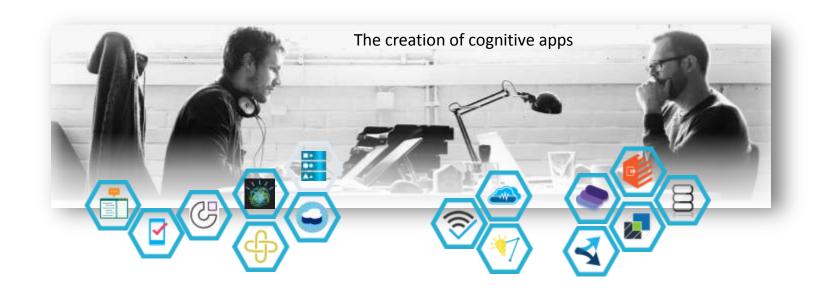
**Providing evidenced based options** 





## **Watson Developer Cloud**

APIs, Bluemix, Softlayer

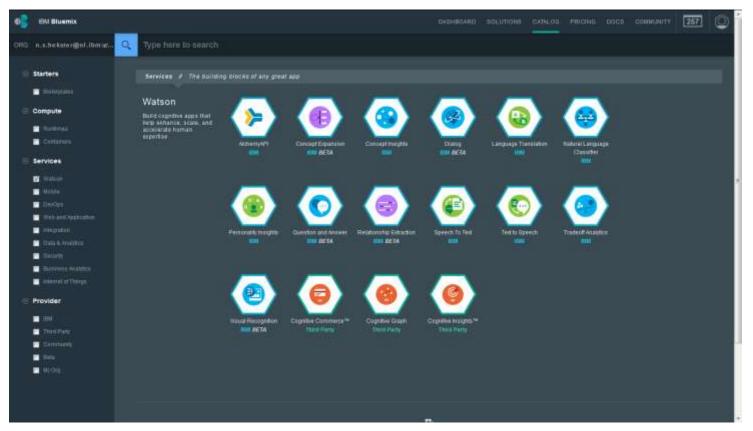








### **IBM Bluemix PaaS platform**





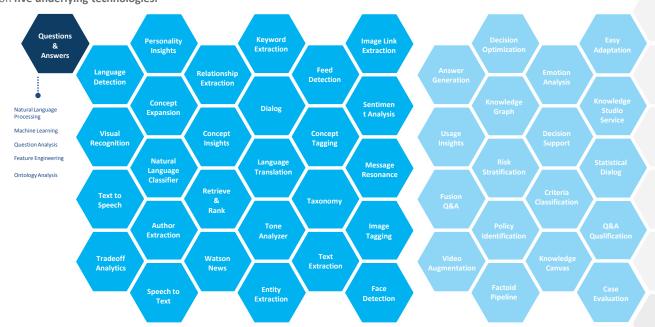


### Catalog will grow from 28 to 50 APIs (2016)

The Watson that competed on *Jeopardy!* in **2011** comprised what is now a single API—**Q&A**—built on **five underlying technologies.** 

Since then, Watson has grown to a family of **28 APIs.** 

By the end of 2016, there will be nearly **50 Watson APIs**—with more added every year.









### **Some Watson Ecosystem Partners in Healthcare & Lifesciences**



























# **IBM Watson Health**



