



Watson in Healthcare

Reykjavik, 22.2.2017



A break through



Our mission

We, Watson Health, aspire to improve lives and give hope by delivering innovation to address the world's most pressing health challenges through data and cognitive insights.

There's a gap in the accuracy of treatment decisions.

As many as **44% of all initial cancer treatments** are modified on the second course of treatment. ¹

Less than 50% of medicine is evidence based.²

An epidemiologist would have to read **167 hours a week** to keep up with new professional insight. ³

Aging populations can't be served.

25% of Japan's population is over 65, growing to 40% by 2060. ⁴



IBM Watson // ©2015 IBM Corporation

IBM Watson Health // SOURCES:

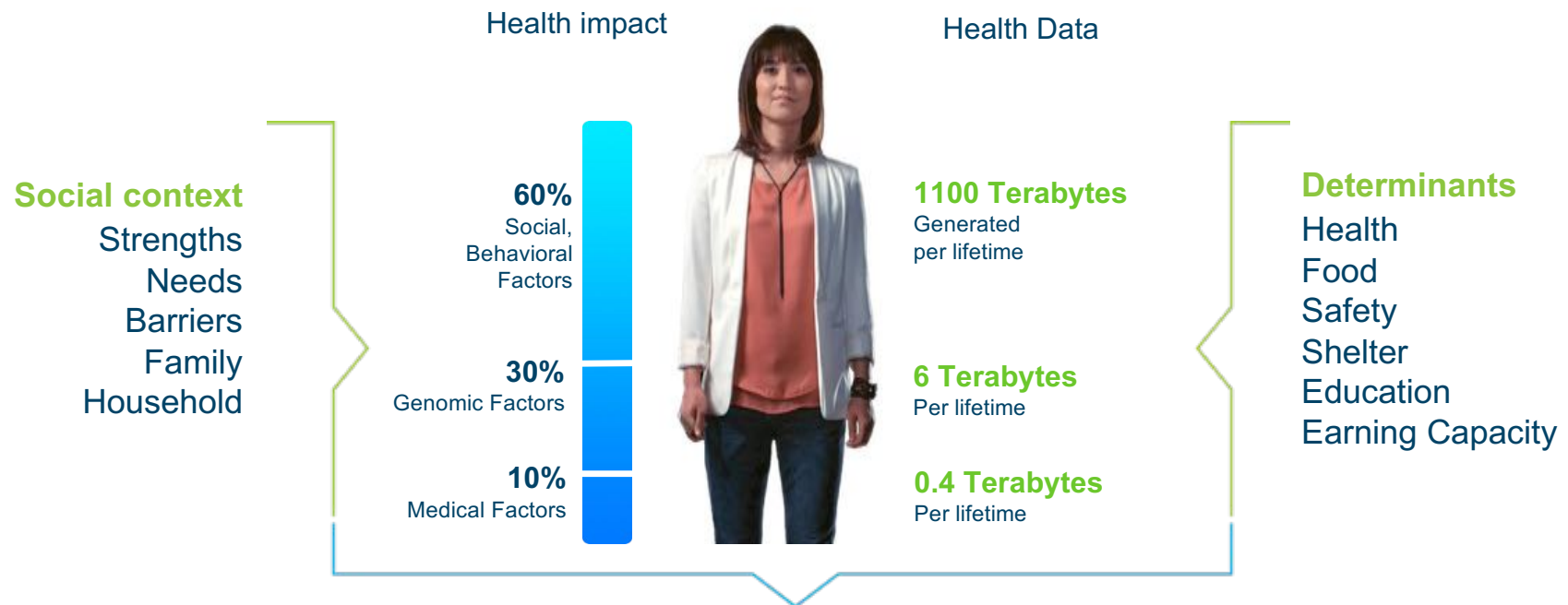
1. Journal of Clinical Oncology, Talk about Health Blog, Sept 2011

2. www.washingtonmonthly.com/features/2007/0710.brownlee.html

3. <http://www.economist.com/blogs/babbage/2013/02/computer-aided-medicine>

4. "Population Statistics of Japan 2012". National Institute of Population and Social Security Research. January 2012.

Why we need more than 0,1% of data that could improve our health to be analyzed



So how can Watson and Cognitive Computing help?

Cognitive: of, relating to, or involving **conscious mental activities** (such as thinking, understanding, learning, and remembering)¹

Cognitive computing is a new computation paradigm that...



learns and builds knowledge from various structured and unstructured vast sources of information;



understands natural language and interacts more naturally with humans;



captures the expertise of top performers and accelerates the development of expertise in others;



enhances the cognitive process of professionals to help improve evidence based decision making; and



elevates the quality and consistency of decision making across an organization

Source[1]: Merriam-Webster Dictionary. [Online]. Available at: <http://www.merriam-webster.com/dictionary/cognitive>

Our goal is to provide insights beyond human cognition

From published knowledge

Proliferation of
medical literature



Institutional
Knowledge

~700 K new
scientific
articles / year



To insights for the individual

Data Generated (per life)

Exogenous data
(Behavior, Environment)
1,100 Terabytes

Genomics
6 Terabytes

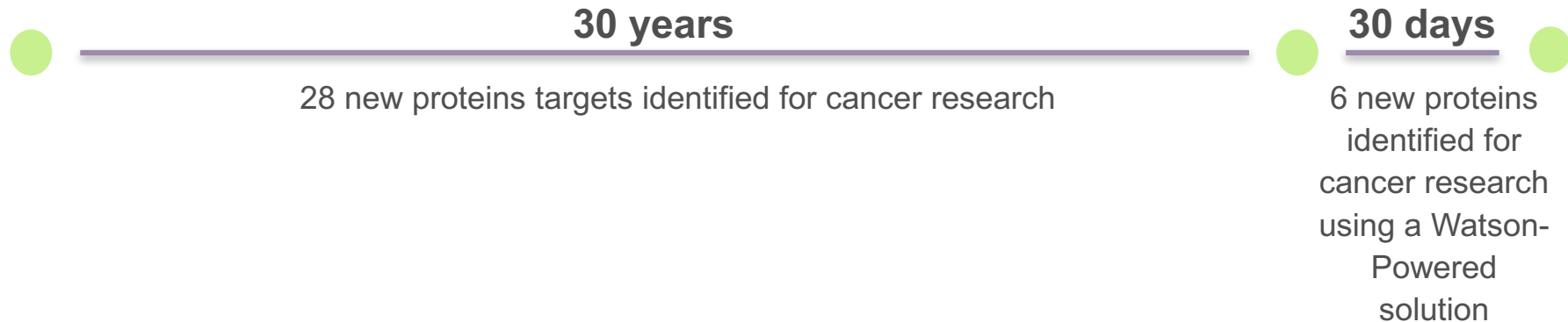
Clinical data
0.4 Terabytes





Case study: Accelerating discovery

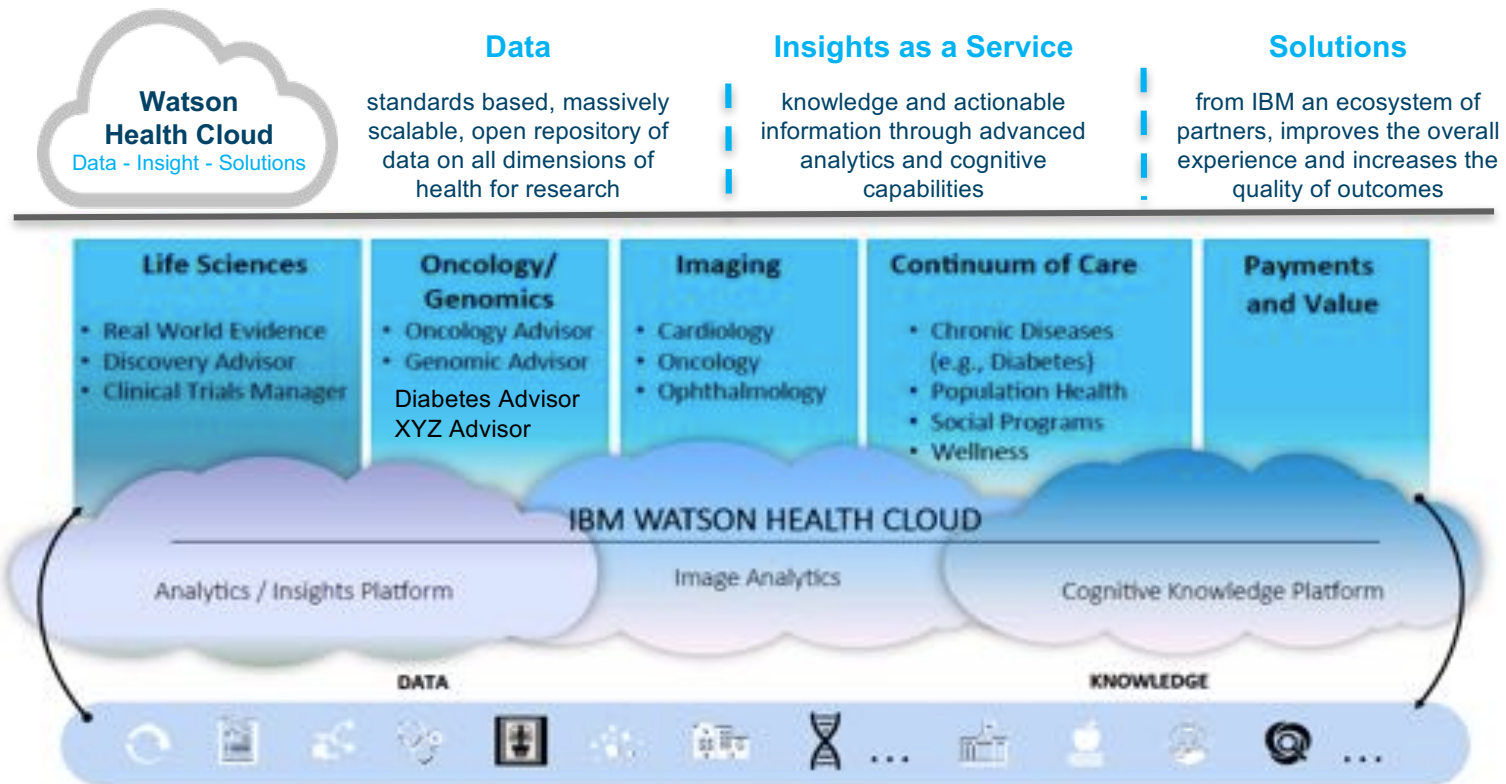
- Using a Watson–powered solution developed with with Baylor College of Medicine to reads and analyzes millions of scientific papers and suggests to researchers where to look and what to look for
- In the last 30 years, scientists have uncovered 28 protein targets.
- The Baylor team found 6 in around 30 days.



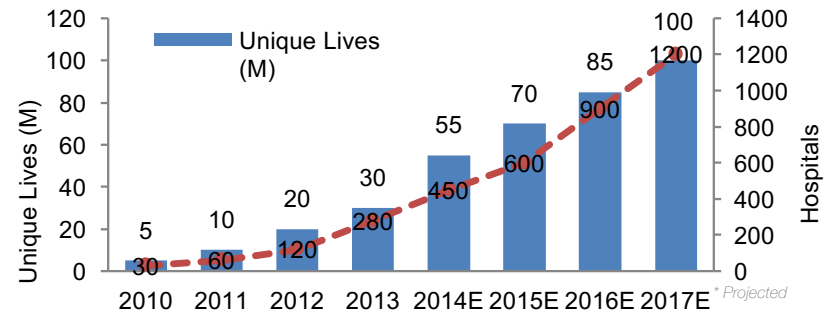
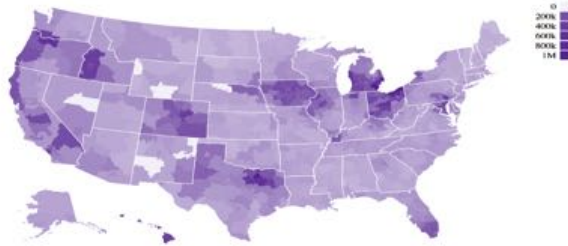
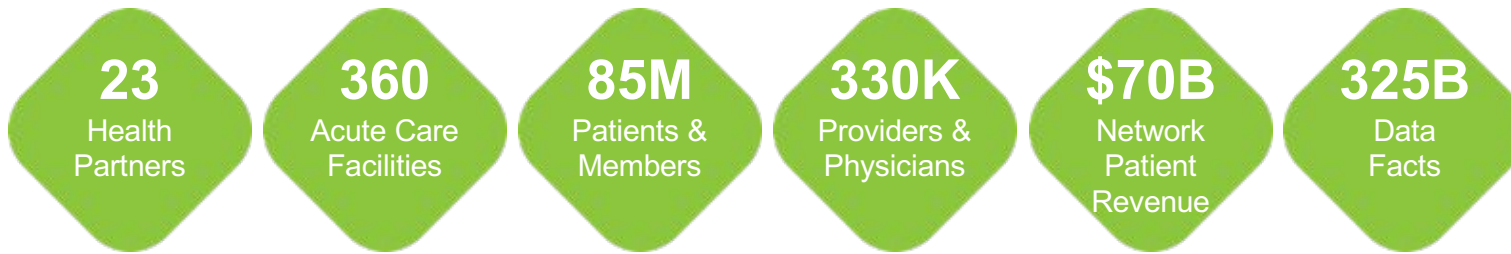
Dec 14, 2016: IBM's Watson supercomputer discovers 5 new genes linked to ALS



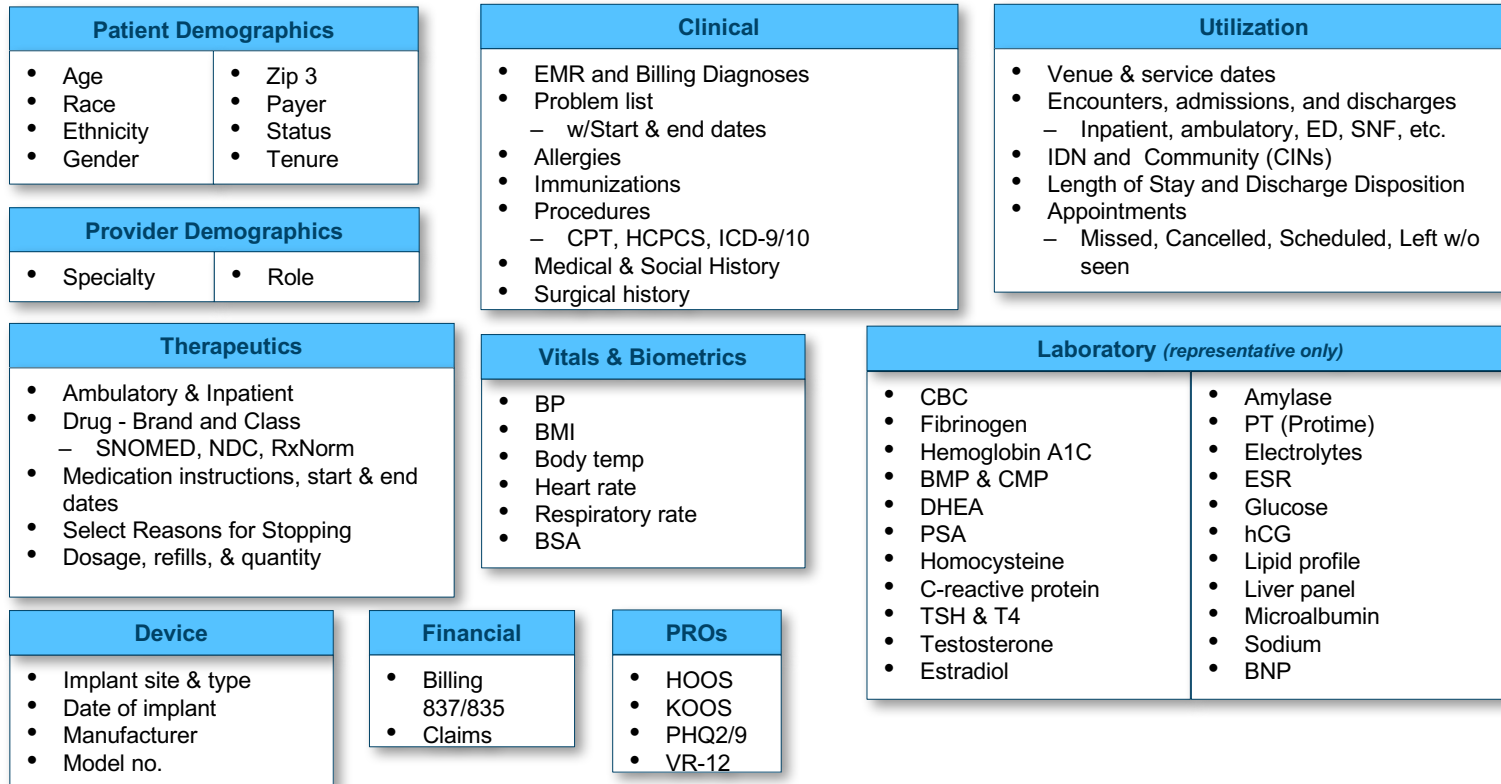
Watson Health is built upon a secure platform of data, knowledge, analytics and industry specific solutions



Watson Health derives overnight data primarily from a large network of clinicians (Explorys) and payers (Truven). Some data points for Explorys



Explorys data represents an unmatched breadth & depth



Example: Diabetics within Explorys

Disease Description

A group of diseases that affect how the body uses glucose (Source: Mayo Clinic)

Search Parameters

- Diagnosis: Diabetes mellitus (Aligned to SNOMED CT terminology system)

Explorys Population

3,053,960 patients ever diagnosed

1,751,210 patients diagnosed in the last 3 years

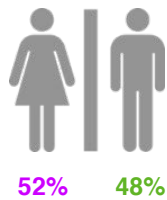
977,130 patients diagnosed in the last year

Comorbidities¹

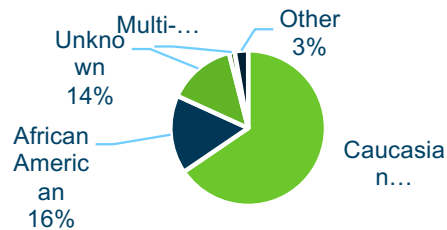
- Heart disease (48%)
- Inflammatory disorder (65%)
- Vascular disorder (50%)

Patient Demographics

Gender



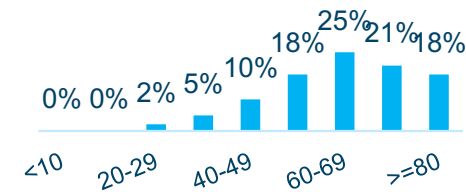
Ethnicity



Insurance

Type	%
Private	41%
Medicare	40%
Medicaid	9%
Unknown	12%
Self Pay	5%

Age



¹(xx%) represents the percentage of patients in Explorys with the featured disease that are diagnosed with the co-morbidity / concomitant condition

Source: IBM Explorys Data pulled November 4, 2015

Population Health Management is becoming critical in most societies - Diabetes is one of our focus areas

- Analytics to identify care opportunities and interventions for individuals in healthy populations that need preventative measures
- Provider-led intervention and engagement of patient populations, from preventative wellness through disease management
- Applications to manage outreach, engagement and on-going interactions with patients
- Over 50 measures and 45 protocols for assessing diabetic and pre-diabetic patients
 - HbA1c testing (1/6mo, 1y, 2y)
 - Nephropathy Screening
 - Missing Foot Exam
 -



IBM Watson (Health) is open for participation & partnerships across the entire value chain

Solutions

Population Health Management

Condition Specific Care

Health and Wellness

Social Programs

Discovery Solutions

Real World Evidence

eHealth Solutions





Medtronic

Medtronic build glucose monitoring devices with Watson that can predict hypoglycemia up to 3 hours in advance of onset.

Café Well , Welltok – powered by IBM Watson



Partnership with Finland

Improve wellness, precision healthcare & create growth



Sep 14, 2016, 07:00 ET - News provided by

HELSINKI and CAMBRIDGE, Mass., Sept. 14, 2016 /PRNewswire/ -- TEKES – the Finnish Funding Agency for Innovation (TEKES) and IBM (NYSE: IBM) today announced a partnerships.

- Central Health cloud for all data (Biobank, Genomics, Hospital)
- Collecting data from wearable devices for citizens
- Spark innovation around their data using Watson Health AI and predictive analytics capabilities on top of health cloud
- With Finnish citizens at the center as the ultimate beneficiaries. This partnership with IBM Watson Health will position Finland to be a forerunner in digitalizing healthcare in the Nordics, Europe and the rest of the world.



TEKES - the Finnish Funding Agency for Innovation and IBM sign a landmark collaboration that will enable Finland to utilize Watson cognitive computing across its health ecosystem. From left to right: Maarit Palo (IBM), Tuomo Haukkovaara (IBM), Pekka Soini (TEKES) and Mika Lestanen (TEKES)

Potential benefits: Growth, employment and new opportunities

1. Make full use of unique and previously untapped data (i.e. biobank, genomic, wellbeing data) and **draw significant insights from this data** that can have a major impact in its approach on population health, healthcare, innovation, and more.
2. Be better positioned to **attract increased activity and investment from foreign companies and use the gained insights to export health innovation to other countries and monetizing innovations**, due to its ability to securely host massive volumes of meaningful and previously unused health data and apply cognitive analytics on this data to generate unique insight.
3. The insights that can be generated from the Watson Health Cloud and ecosystem data/solutions can help **fuel the digital health revolution**, locally and globally.

“When you combine care management, population health management, analytics and predictive modeling you really have all the information needed to best manage patients at your fingertips. With all the shifts occurring in the healthcare industry, the promise of that is gigantic.”

**Stephen Cavalieri, MD
Chief Medical Officer
Envera Health**



Thank you

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IBM



Case study: advancing evidence-based care

- Using a Watson–powered solution, clinicians were quickly armed with evidence-based and confidence-ranked treatment recommendations
- It takes 17 years, on average, for science to be translated into clinical best practice¹
- Recommendations based on the patient’s condition and medical evidence were available in approximately 30 seconds

“It is fast, thorough, and has the uncanny ability to understand how the available evidence applies to the unique individual I am treating.”
--Dr. Stephen Miser,
Chief Medical
Information Officer

29 hours each work day

Required for a physician to stay up-to-date with the latest medical literature

vs.

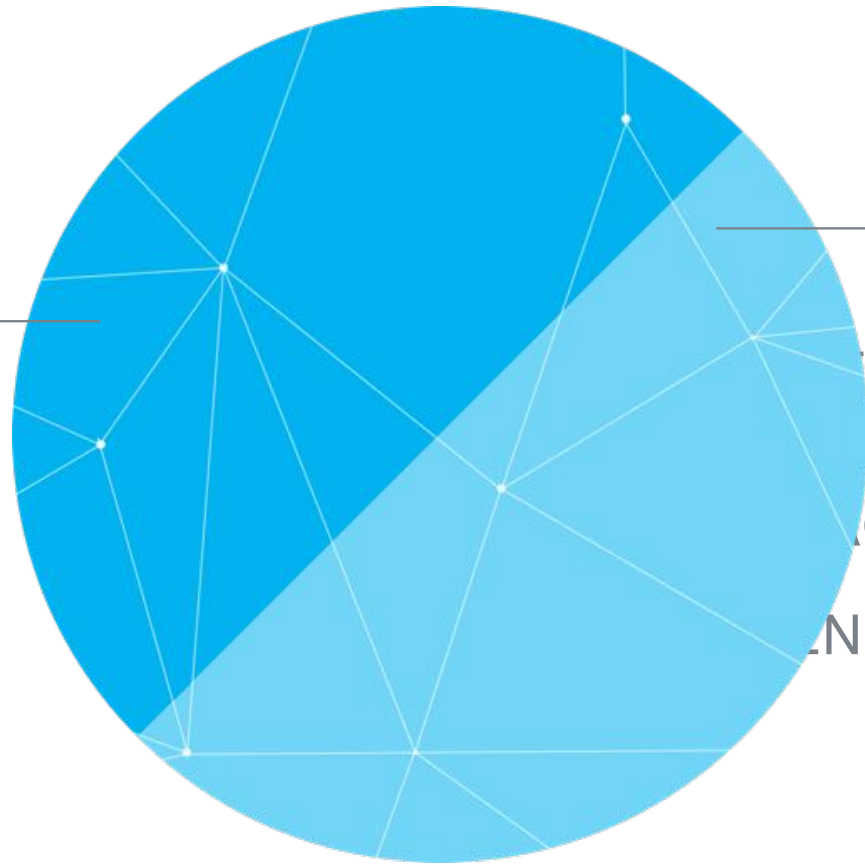
3 seconds

Needed for Watson to read 200 million documents

Cognitive systems are creating a new partnership between humans and technology.

Humans excel at:

COMMON SENSE
MORALS
IMAGINATION
COMPASSION
ABSTRACTION
DILEMMAS
DREAMING
GENERALIZATION



Cognitive Systems excel at:

CULTURAL LANGUAGE
PATTERN IDENTIFICATION
ACQUISITION KNOWLEDGE
MACHINE LEARNING
ELIMINATE BIAS
UNLIMITED CAPACITY

IBM Watson portfolio



Industries

Transformational cognitive industry vertical solutions to drive operational excellence, product leadership and customer intimacy

Health	Comms	Industrial	Distribution	Financial	Public	Services
Life Sciences Oncology Clinical Trial Matching Diabetes Patient Safety EMRA	Digital Agent Theme Park Exp Call Center Ops	Product Safety Field Service Mgt	Shopping Advisor Sales Automation Supply & Logistics Omni-Channel Ops	Fraud Analysis Corp Intelligence Claims Processing Digital Agent	Public Safety National Security	CIO Dashboard Corp Intelligence M&A Advisor



Products & Solutions

Core cognitive technologies enabling the transformation of organizations, industries and markets

Products	Frameworks
Watson Analytics Watson Explorer Watson Knowledge Studio	Watson Trend Chef Watson Watson for Cyber Security
	Care Manager Decision Advisor Discovery Services
	Engagement Advisor Policy Advisor



Platform

Watson APIs that enable the modular construction of cognitive applications

Language	Speech	Vision	Data Insights



Content

Integration with critical data sources

Weather Company	Watson IoT	Watson Security Intelligence	Watson FS Compliance	Health Cloud
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W.I.P.