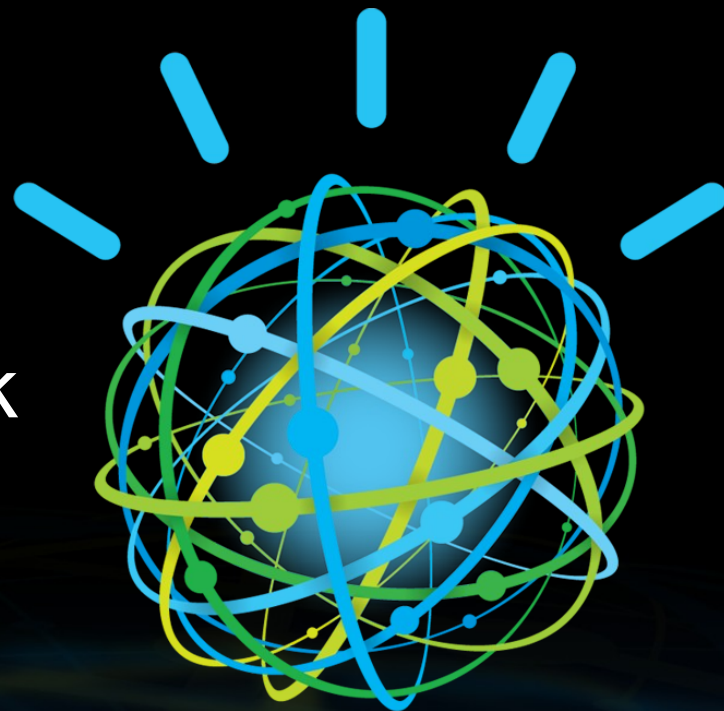


Barry Mason
Vice President, Global Healthcare Payers

Putting IBM Watson to Work In Healthcare



On February 14, 2011, IBM Watson changed history introducing a system that rivaled a human's ability to answer questions posed in natural language with speed, accuracy and confidence.

Watson Wins!

Largest Jeopardy! in 5 years

34.5M Jeopardy! Viewers

1.3B+ Impressions

Over 10,000 Media Stories

11,000 attend watch events

2.5M+ Videos Views (top 10 only) 

12,582 Twitter 

25,763 Facebook Fans 





IBM Watson a look behind the scenes


System Specifications

 **2880 Processing Cores**

 **90 IBM P750 Servers** 

 **16 Terabytes Memory (RAM) – 20TB Disk**

 **80 Teraflops (80 trillion operations per second)**

 **Workload Optimized Systems**




IBM Technology Depth

 **Content Analytics**

 **Business Analytics**

 **Big Data**

 **Databases / Data Warehouses**

In the past 5 years IBM has spent over \$14B in analytical acquisitions and \$6B in R&D annually

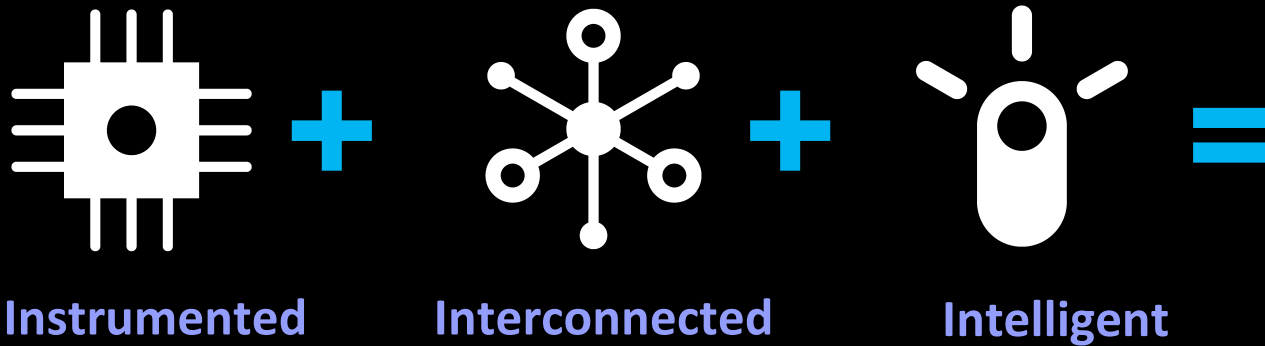
Agenda

What is IBM Watson and why is it important?

How is IBM putting Watson to work?

What can we expect in the future?

The World is Getting Smarter



An opportunity to **think and act in new ways**—
economically, socially and technically.



Data volume is expanding at an incredible rate
...data will grow 800% in the next five years
...Unstructured data grows 10-50X faster than structured

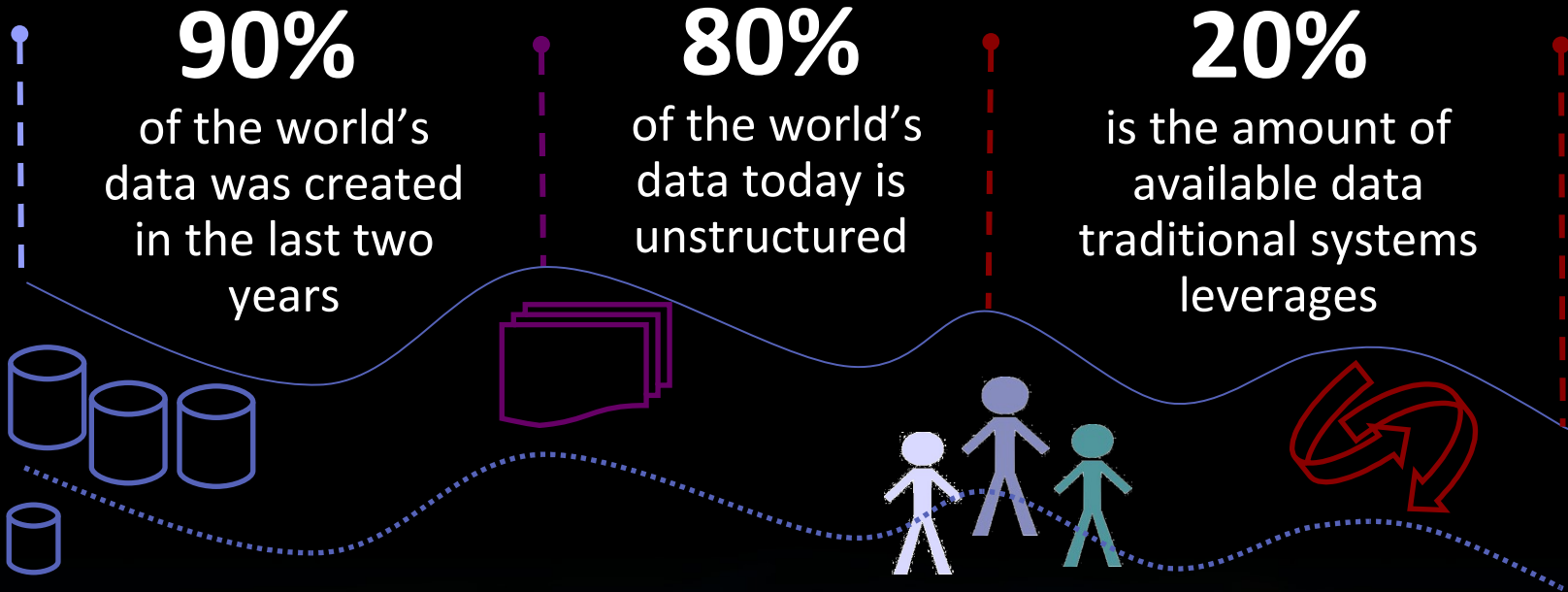


Data is getting more social. . .
...20M articles on Wikipedia
...30B pieces of Facebook content are shared monthly
...There are 156M public blogs



There are over 2.3B people on the Web today ...
... and a trillion connected objects – cars, appliances, cameras, roadways, pipelines

Businesses on a Smarter Planet are “dying of thirst in an ocean of data”



1 in 2

business leaders don't have access to data they need

83%

of CIO's cited BI and analytics as part of their visionary plan

54%

of companies use analytics for competitive advantage

Healthcare Industry is beset with some of the most complex information challenges we collectively face



Medical information is doubling every 5 years, much of which is unstructured



81% of physicians report spending 5 hours or less per month reading medical journals



1 in 5

diagnosis that are estimated to be inaccurate or incomplete



1.5 million

errors in the way medications are prescribed, delivered and taken in the U.S. every year



44,000 -98,000

of Americans who die each year from preventable medical errors in hospitals alone

“Medicine has become too complex (and only) about 20% of the knowledge clinicians use today is evidence-based”

- Steven Shapiro Chief Medical and Scientific Officer, UPMC

Today's business challenges are causing organizations to rethink what it will take to get ahead tomorrow



Traditional IT

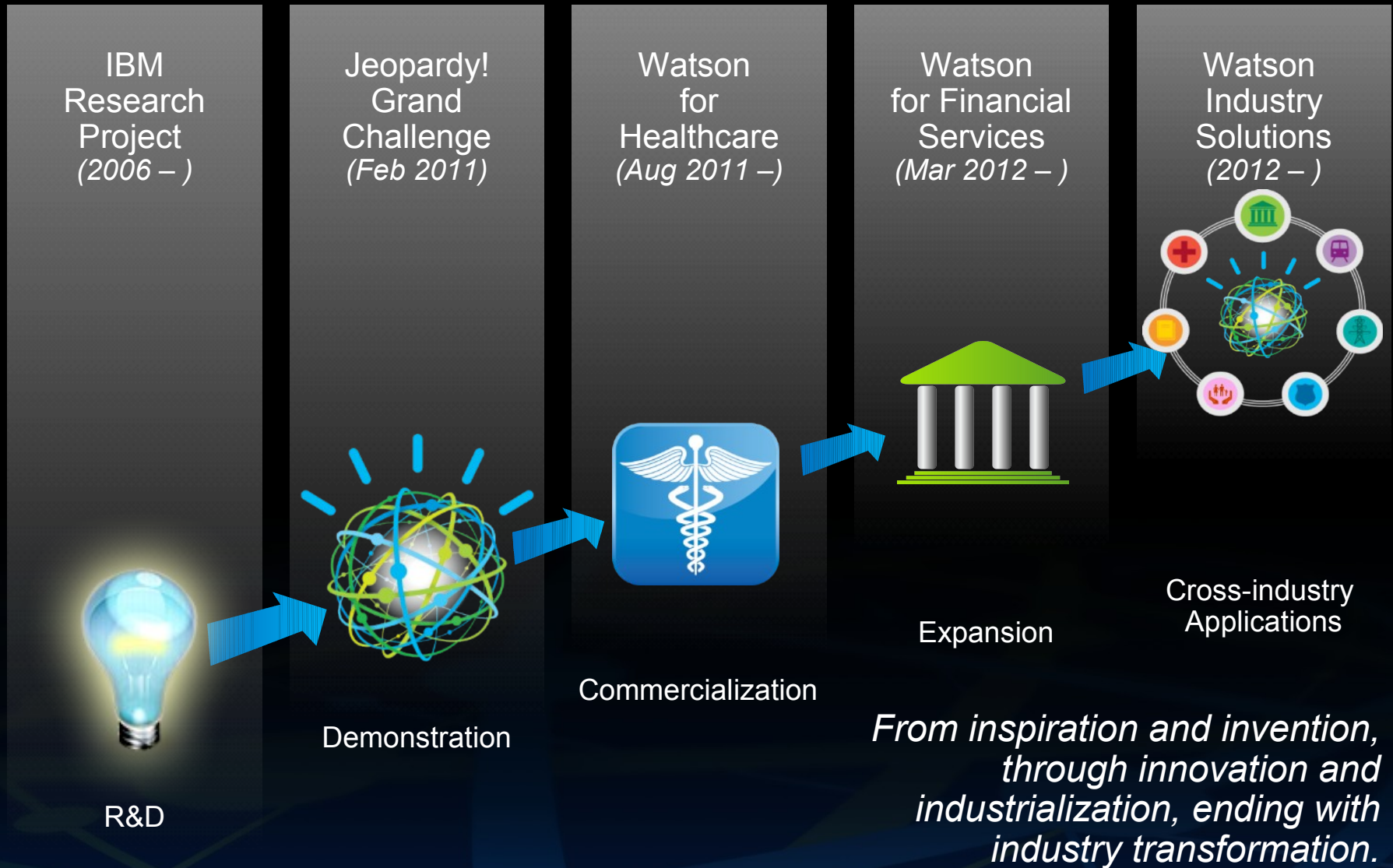
- Structured data (local)
- Deterministic Applications
- Search Oriented
- Small Data
- Machine Language



Emerging IT

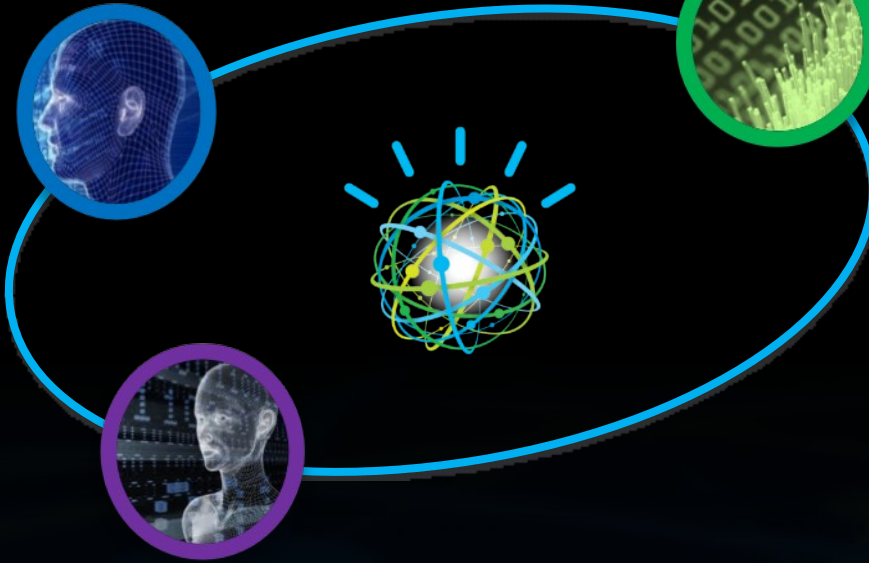
- Structured & unstructured (global)
- Probabilistic Applications
- Discovery Oriented
- Small and Big Data
- Natural Language

Brief History of IBM Watson



IBM Watson brings together a set of transformational technologies to drive optimized outcomes

1 Understands natural language and human speech



2 Generates and evaluates hypothesis for better outcomes



3 Adapts and Learns from user selections and responses

...built on a massively parallel probabilistic evidence-based architecture optimized for POWER7

Why is it so hard for computers to understand humans

	<i>Structured Data</i>	<i>Unstructured Data</i>								
<p>Where was Einstein born?</p>	<table border="1"> <thead> <tr> <th>Physicist</th> <th>Birth Place</th> </tr> </thead> <tbody> <tr> <td>A. Einstein</td> <td>Ulm</td> </tr> <tr> <td>N. Bohr</td> <td>Copenhagen</td> </tr> <tr> <td>M. Curie</td> <td>Warsaw</td> </tr> </tbody> </table> <p>Source: Excel File, Database, etc.</p>	Physicist	Birth Place	A. Einstein	Ulm	N. Bohr	Copenhagen	M. Curie	Warsaw	<p><i>“One day, from among his city views of Ulm, Otto chose a water color to send to Albert Einstein as a remembrance of Einstein’s birthplace”</i></p> <p>Source: http://www.schaeffnacker-ulm.de/en/otto.html</p>
Physicist	Birth Place									
A. Einstein	Ulm									
N. Bohr	Copenhagen									
M. Curie	Warsaw									
<p>Welch ran this?</p>	<table border="1"> <thead> <tr> <th>Person</th> <th>Organization</th> </tr> </thead> <tbody> <tr> <td>L. Gerstner</td> <td>IBM</td> </tr> <tr> <td>J. Welch</td> <td>GE</td> </tr> <tr> <td>W. Gates</td> <td>Microsoft</td> </tr> </tbody> </table> <p>Source: Excel File, Database, etc.</p>	Person	Organization	L. Gerstner	IBM	J. Welch	GE	W. Gates	Microsoft	<p><i>“If leadership is an art then surely Jack Welch has proved himself a master painter during his tenure at GE”</i></p> <p>Source: <i>Jack Welch and the GE Way</i>, Robert Slater</p>
Person	Organization									
L. Gerstner	IBM									
J. Welch	GE									
W. Gates	Microsoft									

Source: IBM Research

Informed Decision Making: Search vs. Watson

Decision Maker

- Has Question
- Distills to 2-3 Keywords
- Reads Documents, Finds Answers
- Finds & Analyzes Evidence

Search Engine

- Finds Documents containing Keywords
- Delivers Documents based on Popularity

Decision Maker

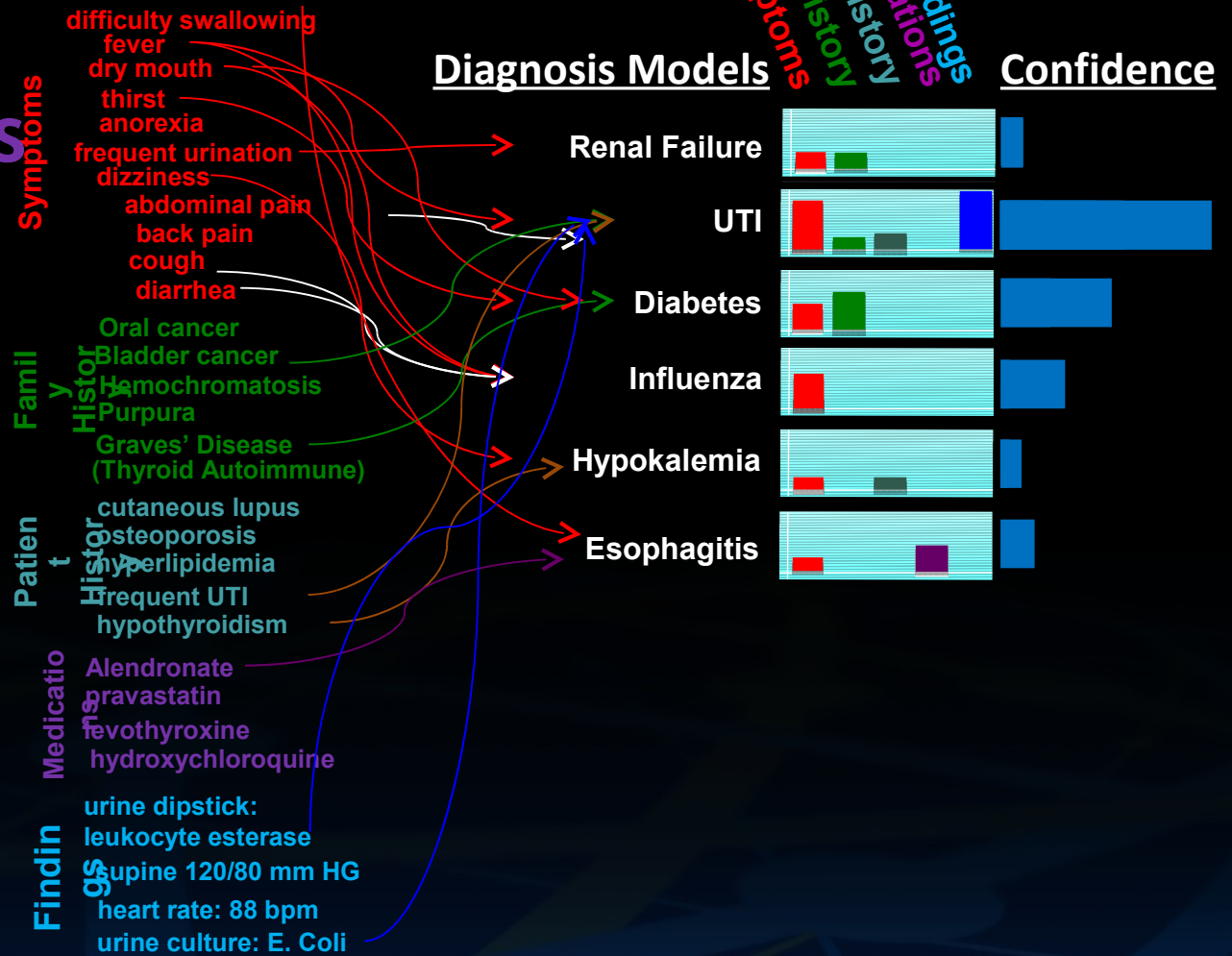
- Asks NL Question
- Considers Answer & Evidence

Watson

- Understands Question
- Produces Possible Answers & Evidence
- Analyzes Evidence, Computes Confidence
- Delivers Response, Evidence & Confidence

Putting the proper pieces together at the point of impact can be life changing

Findings
Symptoms
History



Working Together to Beat Cancer

Cancer is an insidious disease and the second highest cause of death

1 in 4

individuals will die from cancer



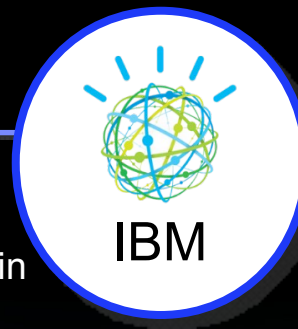
3X

rate cancer cost climbs vs. std. health costs or 15-18% / yr.



.8B

of cancer in the US in 2010



20%

of cancer cases receive the wrong diagnosis initially with some as high as 44%



\$\$\$\$\$\$\$\$\$\$\$\$
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Cancer (US ONLY)	2011 New Cases (est.)	2011 Deaths	%
Respiratory	239320	161250	28%
Digestive	277570	139250	24%
Genital	338620	63980	11%
Breast	232620	39970	7%
Urinary	132900	28970	5%
Lymphoma	75190	20620	4%
Leukemia	44600	21780	4%
Oral	39400	7900	1%
Other	216450	88230	16%
TOTAL	1,596,670	571,950	100%



Working Together to Beat Cancer

Source: American Cancer Society, National Health Institute

IBM Watson and WellPoint putting Watson to work

What if ...

healthcare could leverage the latest insights improving the quality of patient care while lowering costs?

WellPoint is doing it!

- First commercial applications of the IBM Watson technology
- Processing treatment requests faster and more efficiently
- Extended data assessment based on research, clinical, medical, market and patient data
- Applied learning based on action taken and outcome derived



Where to put Watson to work

Watson Capabilities

- 1 Natural language understanding
- 2 Broad domain of unstructured data
- 3 Hypothesis generation and confidence scoring
- 4 Iterative Question/Answering
- 5 Machine learning

Best Fit for Watson

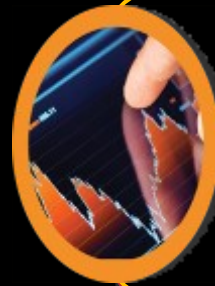
- Problems that require the analysis of unstructured data
- Critical questions that require decision support with prioritized recommendations and evidence
- High value in decision support
- Leverage scale to maximize machine learning and improve outcomes over time

From battling humans on Jeopardy! to changing the way the world thinks, acts, and operates



Healthcare

Diagnostic/treatment assistance, evidenced-based insights, collaborative medicine



Financial Services

Investment and retirement planning, institutional trading and decision support



Contact Center

Call center and tech support services, enterprise knowledge management, consumer insight



Government

Public safety, improved information sharing, security, fraud and abuse prevention

IBM Watson and Smarter Analytics have the capabilities to address grand business and societal challenges

Thank
YOU



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www.twitter.com/ibmwatson
(Tweet #ibmwatson)



www.youtube.com/ibm

