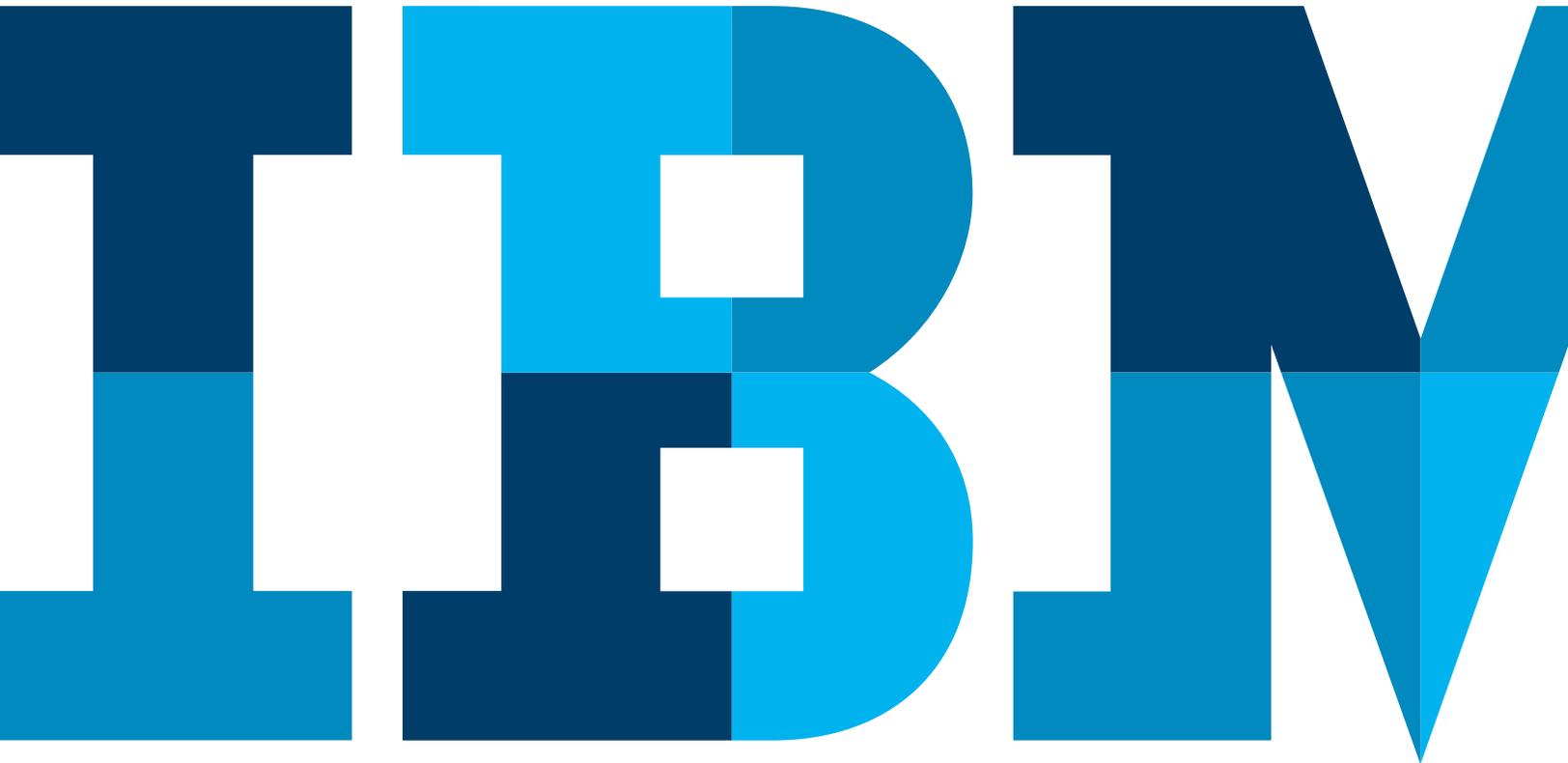# IBM Watson:
Next-generation
cognitive system

Making a market, making a difference

IBM

Introduction

The IBM Watson™ system gained widespread attention by beating two of the all-time winningest human contestants on the television quiz show, Jeopardy! That historic show was also a very public trial of an advanced form of computing: a cognitive system. A system that is not simply programmed but is trained to learn, based on interactions and outcomes. A system that rivals a human's ability to answer questions posed in natural language with speed, accuracy and confidence. A system that brings man and machine together. By accurately extracting facts and quickly detecting relationships in large volumes of data, the technology can help accelerate and improve leadership's ability to make decisions across industries and throughout society. Watson "learns" from additional information, questions and mistakes to improve accuracy over time.

While today's programmable systems can apply volumes of data to a problem, they struggle when the data is unstructured, its accuracy is uncertain or it accumulates at a continually accelerating rate. The result, in the end, is that leadership's ability to make decisions suffers. Watson's cognitive capabilities were designed to take on the real-world challenges of big data in society and across a range of industries; from the outset, the aim was to put Watson to work to help solve real challenges, initially in healthcare and finance. Both industries confront a deluge of unstructured data every day, and both industries have a compelling need to act on information quickly.

Today it's estimated 80 percent of the world's data is unstructured. Increasingly, cognitive systems like Watson will help us make sense of it all.

In 2011, to help improve the quality of care delivered, IBM announced a pilot program with WellPoint, whose affiliated health plans cover one in nine Americans. And in March 2012, IBM launched a partnership with Memorial Sloan-Kettering Cancer Center, where work is under way to teach Watson about oncology diagnosis and treatment options.

Combining its abilities to navigate the complexities of human language and to analyze massive amounts of data exceptionally quickly (over 200 million pages in three seconds on Jeopardy!), Watson has the potential to take advantage of new research studies, published reports and articles, as well as patient outcomes and interactions, to help physicians make evidence-based decisions. In banking, Watson can pore over financial, regulatory, economic and social data across exchanges, currencies and funds at terrific speeds. For example, Citigroup, Inc. has announced it will examine the use of Watson's deep content analysis and evidence-based learning capabilities to advance customer interactions and to improve and simplify the experience of customers.

Vision for Watson

IBM Watson is the very embodiment of this new era of cognitive systems. It represents a new class of industry-specific analytic solutions that leverages deep content analysis and evidence-based reasoning to accelerate and improve decisions, reduce operational costs and optimize outcomes. Watson accomplishes all this based on a set of transformational technologies which leverage natural language, hypothesis generation and evidence-based learning. It combines these technologies and applies massive parallel probabilistic processing techniques to fundamentally change the way businesses look at solving problems quickly. But Watson is more than the sum of its parts; Watson is about bringing a unique combination of capabilities together in a way that's never been done before, resulting in a fundamental change in the way decisions are made.
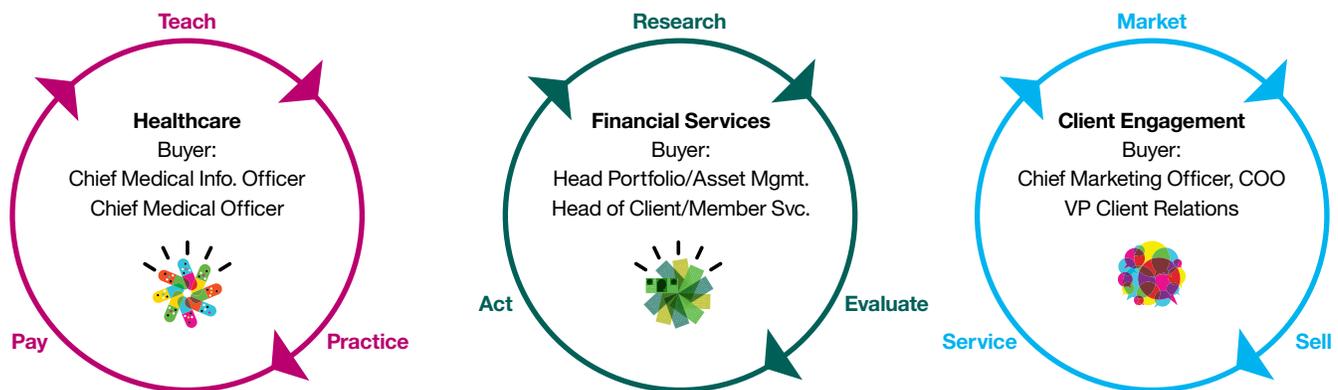
IBM's vision is to define, create and lead markets for this new class of cognitive system by:

1. Addressing meaningful industry and societal challenges, where conventional approaches don't work.

2. Developing a cognitive class of solutions built on a secure, scalable modular framework.

3. Delivering demonstrable, quantifiable value as defined by the client.

This new era of computing is already changing our expectations for how technology can help us live and work in better ways. Cognitive systems can better address today's realities of explosive data growth, rapidly changing business conditions and the need for more intuitive interaction between people and technology. IBM's approach to the marketplace is to:

- *Establish* client and business value with each Watson commercial application developed.
- *Extend* early findings in healthcare and financial services into new industries and horizontal solutions.
- *Embed* experiences learned into go-to-market and delivery practices, partners and IBM's Smarter Planet initiative.

The focus is on understanding the needs of a marketplace and how best to enable transformation. This, in turn, will help define the methodological construct taken to delivering Watson Advisory solutions by industry and orientation. For example:

Teach

Healthcare
Buyer:
Chief Medical Info. Officer
Chief Medical Officer

Pay   **Practice**

Research

Financial Services
Buyer:
Head Portfolio/Asset Mgmt.
Head of Client/Member Svc.

Act   **Evaluate**

Market

Client Engagement
Buyer:
Chief Marketing Officer, COO
VP Client Relations

Service   **Sell**

Goal	Healthcare	Financial services	Customer engagement
	Improve patient outcomes while dramatically reducing cost of care through personalized, evidence-based medicine	Improve knowledge worker's understanding, insights and decision-making in both institutional and retail finance, as well as Insurance	Transforming the contact center from a cost center to a strategic asset for client engagement, customer response and satisfaction through better use of information and interaction
Construct	• Teach: Enable new methods for delivering medical training and instruction • Practice: Enable research and delivery of personalized, evidence-based medicine • Pay: Enable the rapid evaluation and pre-authorization of medical payment	• Research: Ask questions about an asset across a broad corpus of market information • Evaluate: Discover correlation between answers and intrinsic value of an asset • Act: Suggest what action to take in the market (that is, market to a client, portfolio allocation)	• Market: Transform the business through with a game-changing user experience across all channels • Sell: Automate the alignment of solutions to clients with superior client targeting and responsiveness • Support: Answers with confidence and evidence drive agent efficiency; deflect calls to self service for faster response

What's next

Watson extends the possible ways in which organizations, institutions and individuals will learn, process, investigate, optimize, decide and deliver. It brings into focus information and insights that were once unattainable, empowering the knowledge worker to deliver extraordinary outcomes. Watson solutions are best suited to data-intensive industries and issues that:

- Require the analysis of high volumes of structured and unstructured data.
- Benefit from the speed and accuracy of a response to a question or input provided.
- Desire to systematically learn with every outcome or action taken, getting smarter with interaction and new evidence.
- Have critical questions that require confidence-weighted recommendations and supporting evidence.

Where, how and when to put Watson to work may be one of the greatest challenges in the years to come. We have only begun to scratch the surface of what is possible in this new era of computing.

For more information

To learn more about IBM Watson solutions, please contact your IBM representative or IBM Business Partner, or visit the following website: **ibm.com**/innovation/us/watson.