IBM Watson: Next Generation Cognitive System

Making a marketmaking a difference

Introduction

The IBM Watson system gained fame by beating human contestants on the television quiz show Jeopardy! It 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 understanding relationships in large volumes of data, the technology can help accelerate and improve decision-making across industries and in 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 its velocity continually accelerates. The consequence, in the end, is that decision-making 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, at first in healthcare and finance. Both industries confront "deluges" of unstructured data every day, and both industries have a compelling need to act on information quickly.

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.

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

Combining its abilities to navigate the complexities of human language and to analyze massive amounts of data exceptionally quickly (over 200 million pages in 3 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, Citi 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. It accomplishes 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 quickly solving problems. 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 addresses 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 as illustrated below.

	Healthcare	Financial Services	Contact Centers
Goal	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 & 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 (i.e. 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 / 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 a high volumes of both 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.