



Highlights

- IBM's Watson—the computing system that competed with human contestants on Jeopardy!—illustrates how analytics can help healthcare organizations glean actionable insights for better decision making
 - Watson demonstrates the ability to activate hundreds of different queries that delve through masses of data to come up with, and put confidence behind, an answer
 - Healthcare organizations can get started today by integrating information, instrumenting processes and systems, and applying insights for better clinical and business results
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Gain insights to improve performance and care

IBM's Watson and the future of healthcare

Watson, named after IBM founder Thomas J. Watson, was built by a team of IBM scientists who set out to accomplish a grand challenge—build a computing system that rivals a human's ability to answer questions posed in natural language with speed, accuracy and confidence. The Jeopardy! format provides the ultimate challenge because the game's clues involve analyzing subtle meaning, irony, riddles, and other complexities in which humans excel and computers traditionally do not.

But Watson's breakthrough is not in natural language alone. Its ability to trigger hundreds of different analytical queries to analyze both structured and unstructured data to come up with answers, and then put confidence behind each answer, represents an advance for real-world problems that are emerging in business.

Today, intelligence is increasingly being embedded in every operational process—from supply chain management, to human resources and payroll, to financial management, security and risk. And now, as more of the world becomes instrumented—everything from roadways, power grids, consumer goods and food—businesses need the ability to analyze the data coming from these sources in real-time.

Traditional computing systems are built to analyze stored information, or to run transactions in batches. But in today's environment, the demands of business require the same kind of real-time response and advanced analytics that is needed to answer questions on Jeopardy!



The performance of these computing systems—the hardware and software that enable business processes—is increasingly associated with the performance of the business. Watson is one example of the new breed of tools that businesses will apply to achieve their business objectives with speed and precision.

Turn data into insights to help improve performance

One industry that can benefit from the many advances in analytics is healthcare. Costs are skyrocketing; hospitals, physician practices, governments, insurers and pharmaceutical companies must take a greater stake in building high performance healthcare systems.

To achieve this, healthcare organizations can take three initial steps:

- Instrument their processes, systems and people in order to deliver trusted views of critical clinical and business information.
- Apply analytics to make sense of increasing amounts of data to help improve clinical and business performance.
- Use information and insights in a predictive way to not only increase operational dexterity but also to intervene and innovate in care.

The real innovation will come when care providers begin to employ analytics to mine patient data correlated with family histories to provide better risk assessment, prediction and prevention; earlier detection; earlier treatment; and targeted treatments. Or, when healthcare practitioners can access unique and actionable insights from the massive amount of data constantly being generated in medical research, clinical knowledge and journals to help treat an individual patient.

While Watson represents a major computing milestone, the real pioneers will be the healthcare organizations who apply predictive analytics to gain meaningful insight from their data—from reducing clinical, operational and financial variability to delivering actionable intelligence in context to physicians, to enabling entirely new models of care.

Putting the power of Watson to work

The deep analytics capability that Watson demonstrates calls to mind these very real possibilities. But better clinical and business results using analytics can be achieved today. IBM is already working with healthcare organizations worldwide, applying analytics to help them reduce costs and to improve clinical and business performance:

- With IBM's help, the **University of North Carolina (UNC) Health Care System** created a governance framework to ensure data consistency and accuracy and then developed its clinical data warehouse. Benefits include faster research cohort identification, facilitating over \$60 million in new research funding due to superior data management capabilities, and the ability to negotiate higher reimbursements from payers by demonstrating adherence to high quality care practices.

- IBM is working with the **University of Ontario Institute of Technology (UOIT)** in Oshawa, Ontario and **The Hospital for Sick Children** in Toronto to monitor premature infants in the neonatal intensive care unit. The goal is to capture vast amounts of physiological data from premature babies, to leverage these data points for the development of predictive models for the early detection of dangerous infections, and to deploy these models on IBM InfoSphere Streams for the real-time analysis of physiological patient data.

This real-time analysis will transform patient monitoring data into intelligence presented to physicians and nurses in near-real time. Real-time analytics are performed as data is created at very large rates (up to a thousand readings per second).

Great strides continue to be made at the research stage, and it is anticipated clinicians will soon be taking advantage of this analysis which can provide advance warnings about late onset neonatal sepsis.

“By merging our research and technology, we are able to collect more detailed patient data in a systematic manner, do online health analysis and decision support, and get advanced early warning of emerging patterns that could predict a medical event.”

— Dr. Carolyn McGregor, University of Ontario Institute of Technology (UOIT)
Associate Professor and Canada Research Chair in Health Informatics



For more information

IBM can provide the same kind of system and analytics capabilities that power Watson to healthcare organizations. The experts who built Watson are on hand to help you chart a path to get more value out of your data.

IBM's Centers of Excellence, proof-of-concept engagements, and Research "First of a Kind" projects conducted with clients demonstrate innovation and proven ability in solution implementation.

To learn more about IBM's analytics capabilities or to meet with one of our experts, or to see IBM Systems in action, contact your IBM sales representative or IBM Business Partner, or visit the following website: ibm.com/healthcare

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¹ America's Favorite Quiz show® Jeopardy! features trivia in history, literature, pop culture, science and more. The game poses a grand challenge in computing because its clues involve analyzing subtle meaning, irony, riddles, and other complexities in which humans excel and computers traditionally do not.



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