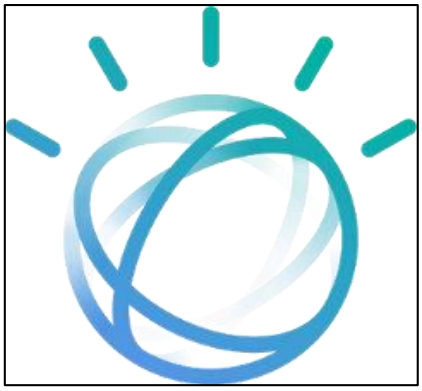


What is Watson?

Talking of what is Watson actually, it is a question-answering computer system capable of answering questions posed in natural language. It mainly helps us to predict and shape future outcomes, automate complex processes, and optimize our employees' time.

IBM Watson

Basically, moving on the origin of such a high complex AI system, it can be said that –

"Watson is IBM's suite of enterprise-ready AI services, applications, and tooling."

In other words, its IBM Watson supercomputer.

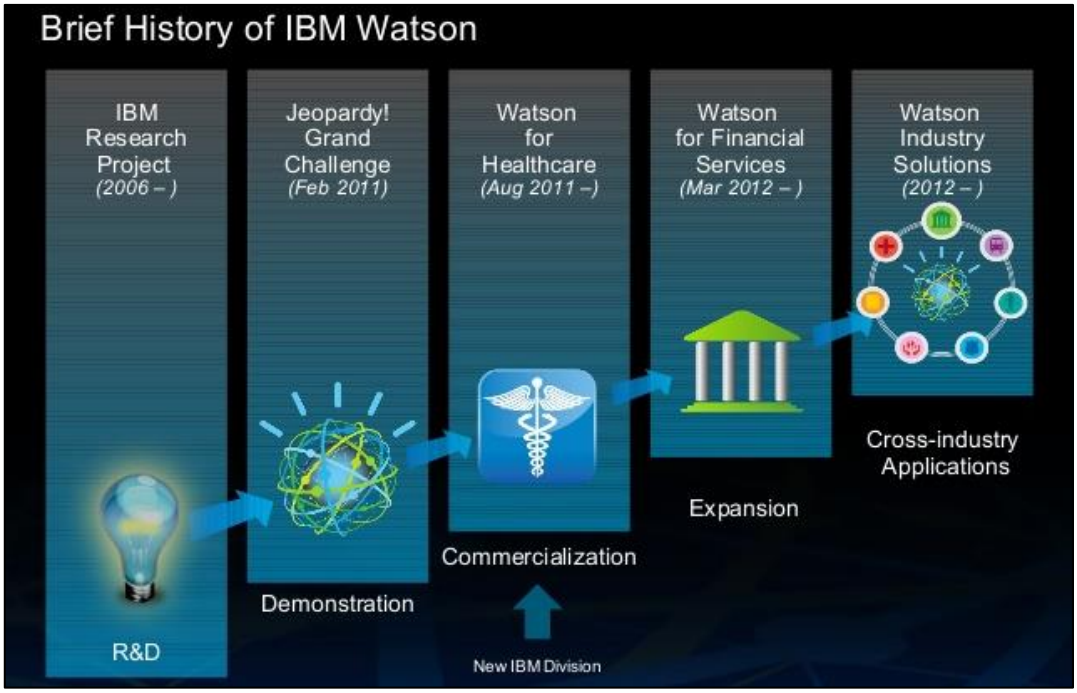
Defining in simple language, Watson is an IBM supercomputer that combines artificial intelligence (AI) and sophisticated analytical software for optimal performance as a "question answering" machine.

History

Watson was named after IBM's founder and first CEO, industrialist Thomas J. Watson.

Watson isn't a software program or a single algorithm or an actual physical supercomputer sitting in a room somewhere at IBM. When IBM researchers talk about "Watson," they're actually talking about a suite of computing capabilities that combine together to perform a function which is taking large, unstructured data sets in the English language and pulling answers to queries out of that data.

Talking about the journey of Watson till today is a very interesting fact to know about. Let's check it out in a much detailed form:



2006 – The idea of Watson sparked the minds of the researchers but they were not sure of how to start and where to start it from.

2010 - In a fall 2010 AI Magazine article, IBM researchers reported on their three-year journey to build a computer system that could compete with humans in answering questions correctly in real time on the TV show Jeopardy! This project led to the design of IBM's DeepQA architecture and Watson by a research team led by principal investigator David Ferrucci.

2011 - In 2011, Watson challenged two top-ranked players on Jeopardy! -- champions Ken Jennings and Brad Rutter -- and famously beat them.

2012 - In 2012, Watson became smarter, faster and more scalable.

2013 - In February 2013, IBM announced that Watson software system's first commercial application would be for utilization of management decisions in medical sector for lung cancer treatment at Memorial Sloan Kettering Cancer Center, New York City, in conjunction with WellPoint (now Anthem). Manoj Saxena, IBM Watson's then business chief, said in 2013 that 90% of nurses in the field who use Watson now follow its guidance.

Why Watson?

It is very obvious to ask why did we choose QA technology over document search. What is special about it?

The answer to this is the key difference between QA technology and document search which is explained below. The document search takes a keyword query and returns a list of documents, ranked in order of relevance to the query (often based on popularity and page ranking), while QA technology takes a question expressed in natural language, seeks to understand it in much greater detail, and returns a precise answer to the question.

Answer the above question in a more broaden sense:

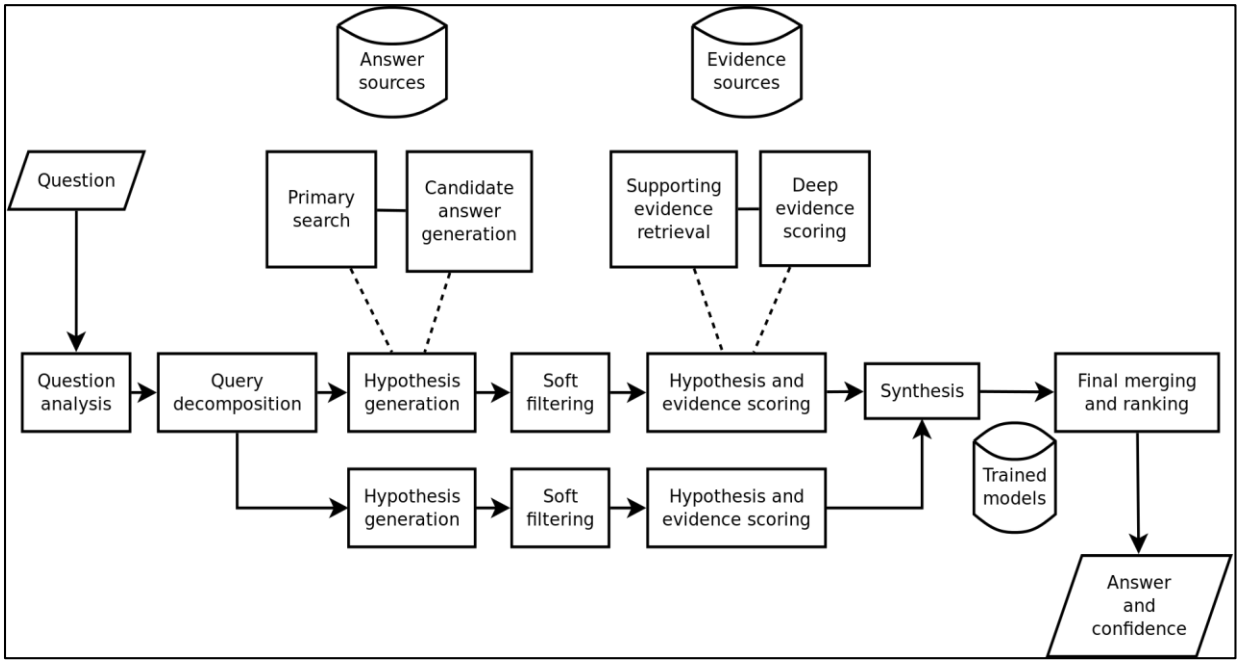
- Watson helps us to unlock the value of our data in entirely new, profound ways.
- By freeing employees from repetitive tasks, we can empower our teams to focus on more creative, higher-value work.
- With insights from Watson, we can easily predict and shape future business outcomes, while rethinking our practices and workflows.

IBM researchers concluded that DeepQA proved to be an effective and extensible architecture which could be used to combine, deploy, evaluate and advance a wide range of algorithmic techniques in the field of question answering.

Architectural Description of Watson

- The Watson supercomputer processes at a rate of 80 teraflops (trillion floating point operations per second).
- And to replicate a high-functioning human's ability to answer questions, Watson accesses 90 servers with a combined data store of over 200 million pages of information, which it processes against six million logic rules.
- The system and its data are self-contained in a space that could accommodate almost 10 refrigerators.

Flowchart for the functioning of a Watson System



The sources of information which are used as questions to provide Watson for answers include encyclopaedias, dictionaries, thesauri, newswire articles and literary works.

Watson used databases, taxonomies and ontologies including DBPedia, WordNet and Yago.

Key components of Watson

- Apache Unstructured Information Management Architecture (UIMA) frameworks, infrastructure and other elements required for the analysis of unstructured data.
- Apache's Hadoop, a free, Java-based programming framework that supports the processing of large data sets in a distributed computing environment.
- The system has been written in various languages, including Java, C++, and Prolog.
- SUSE Enterprise Linux Server 11, the fastest available Power7 processor operating system.
- 2,880 processor cores.
- 15 terabytes (TB) of RAM.
- 500 gigabytes (GB) of pre-processed information.
- IBM's DeepQA software, which is designed for information retrieval that incorporates natural language processing (NLP) and machine learning.

What Watson can do for us?

- Accelerate research and discovery
- Enrich our interactions
- Anticipate and pre-empt disruptions
- Scale expertise and learning
- Detect liabilities and mitigate risk

Performance of Watson

- Watson's applications for underlying cognitive computing technology are almost endless.
- The device can perform text mining and complex analytics on huge volumes of unstructured data.
- It can support a search engine or an expert system with capabilities far superior to any previously existing.

Real time applications of Watson

Here are five different types of applications where Watson is making an impact.

1. Healthcare

i. The most impacted sector by Watson is the Medical sector where it plays a vital role in allowing doctors and physicians to do their duties in a much sophisticated manner.

ii. In benefitting to cancer research, Watson is speeding up DNA analysis in cancer patients to help make their treatment more effective. For instance, Watson has taken residence at three of the top cancers hospitals in the US -- Memorial Sloan Kettering

Cancer Center, University of Texas MD Anderson Cancer Center, and the Mayo Clinic -- where it helps with cancer research and patient care.

iii. For physicians, Watson is helping with diagnoses. A dermatology app called schEMA allows doctors to input patient data and, using natural-language processing (NLP), helps identify potential symptoms and treatments.

iv. Additionally, for doctors, Watson uses vision recognition to help read scans such as X-rays and MRIs to better narrow the focus on a potential ailment.

v. Moreover, it is used in veterinary medicine as well.

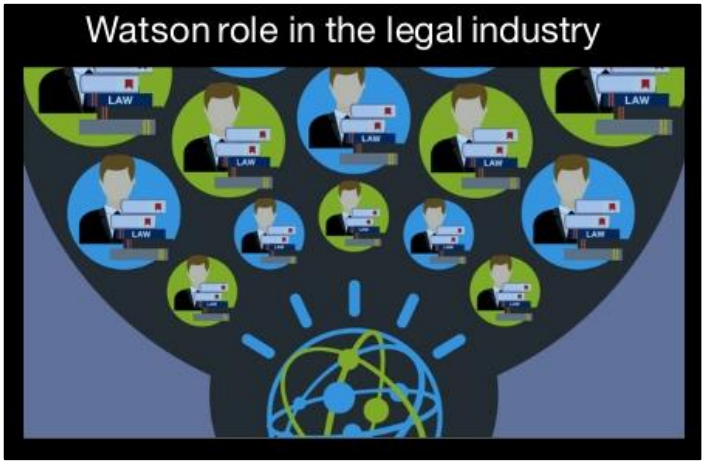
2. Finance

i. In the financial sector, Watson use is typically geared toward its question and answer capabilities. By not only answering questions, but also by proper analysing, Watson can help give financial guidance and help manage financial risk.

ii. In Australia, the company ANZ Global Wealth is focused on the latter. The company uses the Watson Engagement Advisor Tool, an NLP SaaS offering, to observe and field customer questions.

iii. Similarly, DBS bank in Singapore uses Watson to ensure the proper advice and experience for customers of its wealth management business.

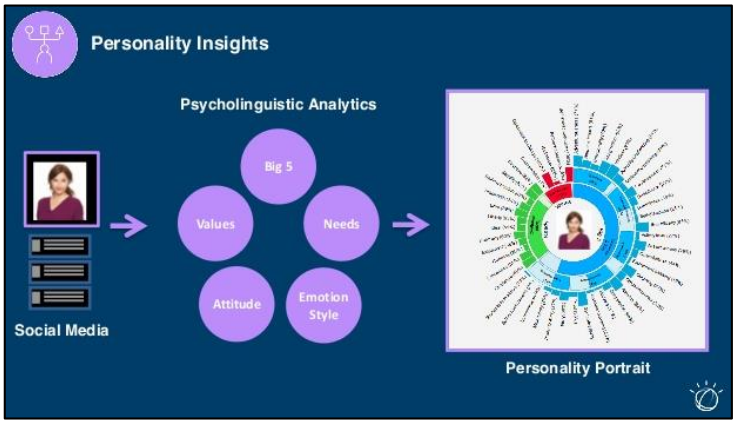
3. Legal



i. When it comes to the law, most of us likely have more questions than answers on any topic. However, start-ups such as ROSS Intelligence Inc. are using Watson to make it easier to get answers to your burning legal questions.

ii. Singapore's Inland Revenue Authority is another organization using Watson to help answer legal questions, deploying Watson to field questions about tax.

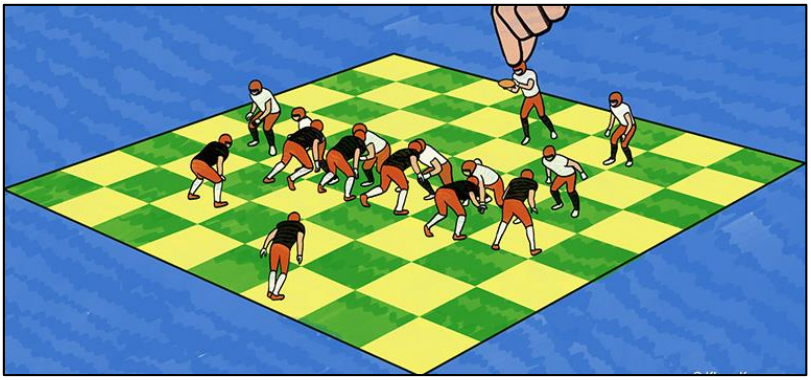
4. Retail



i. Modern retail experiences are all about personalization. Natural Selection is an app created by Sellpoints that uses Watson's NLP capabilities to present products to customers at the most appropriate point in the buying cycle. This can help reduce the overall number of clicks until conversion for an online retailer.

ii. Watson is also being used in online travel purchases. Travel company WayBlazer has created a Discovery Engine that uses Watson to take in and analyze data to better link additional offers and customize preferences for individual consumers.

5. Fantasy Football



i. This may seem like an odd place for IBM Watson to make a mark, but the fact is that there's a ton of data that can be leveraged in fantasy sports.

ii. Edge Up Sports has a Watson-powered platform that analyzes NFL data to help fantasy football fans make better choices during the season. It analyzes data such as news about the teams and tweets from individual players.

iii. It specifically relies on Watson APIs and IBM Watson Personality Insights to streamline the research process for fantasy sports.
