Contact: Bill Chamberlin, Principal Emerging Trends Research Analyst / HorizonWatching Community Leader
January 30, 2014

Cognitive Computing

A 2014 HorizonWatching Trend Report

Note: This report is based on internal IBM analysis and is not meant to be a statement of direction by IBM nor is IBM committing to any particular technology or solution.

About this Report

- **Purpose:** This HorizonWatching Trend Report provides an overview on the Cognitive Computing trend for IBM Clients
- **Content:** Summary information about the trend is provided along with many links to additional resources.
- **How To Use This Report:** This report is best read/studied and used as a learning document. There are many links provided in the report that will take you to other websites and resources where you can continue your learning. You may want to view the slides in slideshow mode so you can easily follow the links

Cognitive Computing - Trends to Watch in 2014

1. **Computers That Learn:** To truly learn, computers must be able to process sensory as well as transactional input, draw inferences from past experience, understand uncertainty, draw initial conclusions, interact with people in a natural, human-language like way and then modify conclusions according to feedback. This is a tall order.
2. **Computers That Think:** To solve problems like a human, computers will need advanced artificial intelligence algorithms and applications that mimic the brain's abilities for perception, action and cognition.
3. **Computers That Interact with Humans:** Humans will interact naturally with computers using advanced technologies like voice, gesture, and touch.
4. **Computers That Interact with other Computers:** Leveraging the Internet of Things, enterprises become interested in building sense and respond networks of smart machines and devices that talk to each other, make decisions, and get work done autonomously.
5. **Much More Research Needed:** Cognitive systems will require scientific breakthroughs at every layer of information technology. There is much work to do.

Video: Bending the Knowledge Curve with IBM Watson

Cognitive Computing - Trends to Watch in 2014 (cont.)

6. **Pilots / Case Studies:** 2014 is the year to produce thought leadership content that documents the results of early adopters and informs researchers of requirements for future versions. Then more pilots are needed.
7. **This is not "Skynet":** In 2014, all stakeholders need education around Cognitive Computing, including Universities, Students, Developers, Customers, Business Partners, Analysts, Journalists, Investors, and Employees. Vendors should focus on creating and distributing thought leadership content, holding briefings/webinars and social discussions.
8. **Cognitive API's:** IBM made a significant announcement in November 2013 about access to Watson APIs. Eventually, all enterprise and mobile apps we use will have capability for users to verbally ask questions and interact to fine tune searches, analysis, and visualizations. Expect a whole new breed of apps from developers to begin to become widely available over the next few years.
9. **IBM's Watson Group:** IBM made another significant announcement in January when it formed the Watson Group. Expect a whole new class of software, services and apps that think, improve by learning, and discover answers and insights to complex questions.

Press Release: IBM Forms New Watson Group to Meet Growing Demand for Cognitive Innovations

"New systems that begin to fulfill some of the earliest visions for what information technologies might accomplish — doing what we thought only people could do and machines could not —are now finally emerging." – **Gartner** (link)

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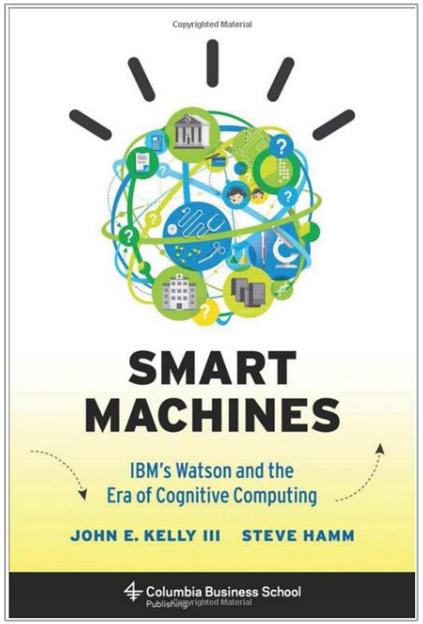
Cognitive Computing - Trends to Watch in 2014 (cont.)

10. **BYOCA (Bring Your Own Cognitive App):** Over the next five years Intelligent Agents designed for consumers will win the mass market play and eventually be adopted by enterprises for their workforce.
11. **Siri and Google Now:** Expect both the accuracy and the capabilities of these services to further improve.
12. **Microsoft's Cortana Anticipated:** MS wants to play in the game too. A 2014 announcement is expected.
13. **Potential for Workplace Disruption High:** It may take many decades, but machines will eventually be able to handle many blue and white collar job activities. This will have implications across all businesses and governments.
14. **Industries Will Be Transformed:** Not in 2014, but the potential for industry-wide disruption is high. Scenario planning required. First movers may gain a competitive advantage.
15. **Window of Opportunity:** Expect the next few years to be a gold rush of sorts with large vendors building capabilities and buying companies with assets and intellectual property.
16. **Leadership Required:** As with any new technology, the Cognitive Era will require leaders who are able to transform business processes and corporate culture in order to leverage the technology.

Book: Smart Machines: IBM's Watson and the Era of Cognitive Computing



"The smart machine era will be the most disruptive in the history of IT." – **Gartner** (link)

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We are on a journey to a new era of computing capability that IBM calls Cognitive Computing

"The machines of tomorrow – cognitive systems -- will forever change the way people interact with computing systems to help people extend their expertise across any domain of knowledge and make complex decisions involving extraordinary volumes of fast moving Big Data." **– IBM** (link)

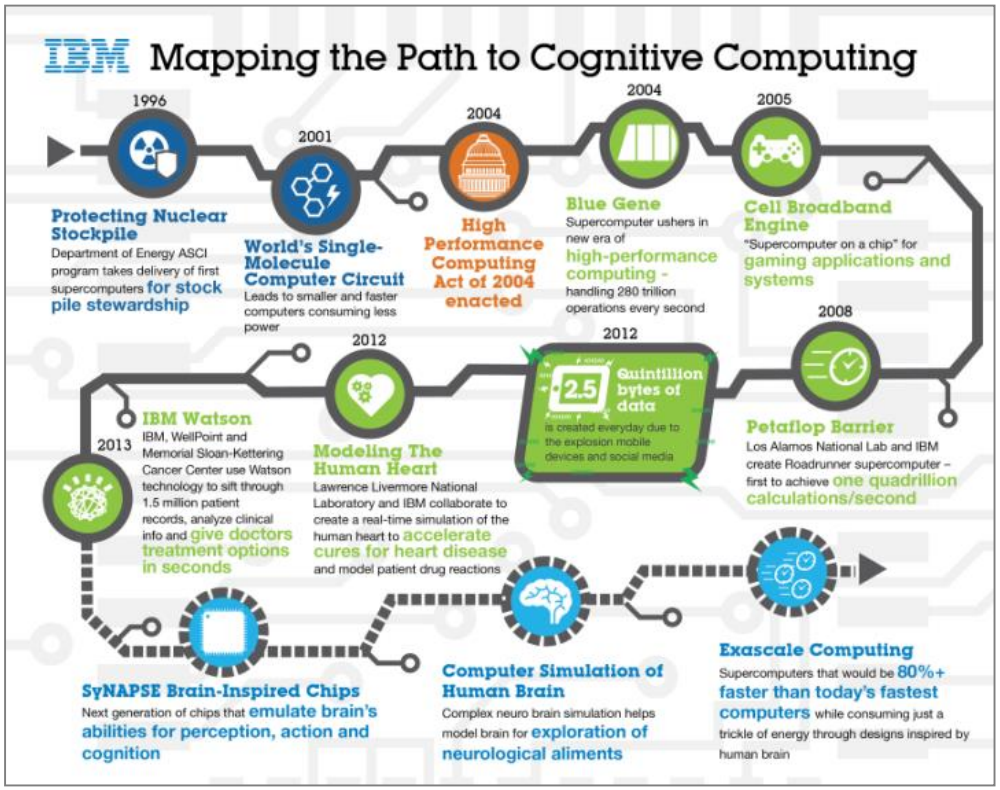

Image found at: InfoGraphic: Mapping the Path to Cognitive Computing

"Cognitive systems like Watson may transform how organizations think, act, and operate in the future. Learning through interactions, they deliver evidence based responses driving better outcomes." **– IBM (link)**

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Gartner calls this the “Smart Machines” era and that we can expect a whole new set of decision support capabilities emerge

“Through 2020, the smart machine era will blossom with a proliferation of contextually aware, intelligent personal assistants, smart advisors (such as IBM Watson), advanced global industrial systems and public availability of early examples of autonomous vehicles.” - **Gartner** (link)

“Aggressive early-adopter companies can realize competitive advantage by employing smart machines, such as cognitive systems, autonomous vehicles and mobile robots.” - **Gartner (link)**

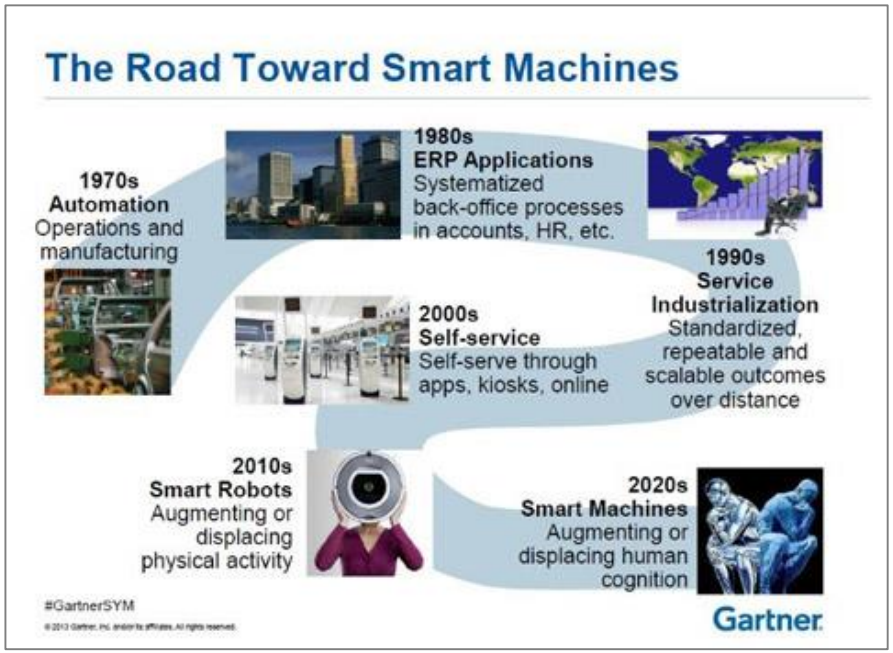


Image found at: **PC Magazine:** Will Smart Machines Take Your Job?

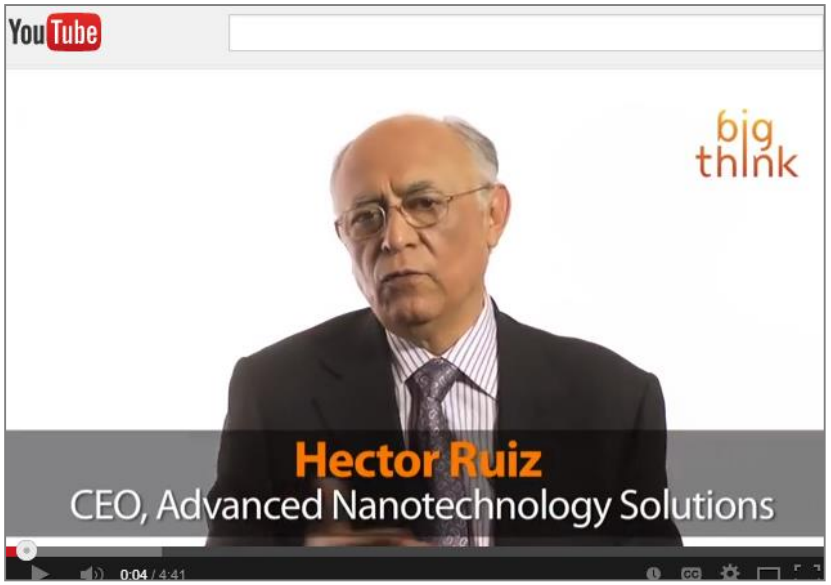
“The smart machine era will be the most disruptive in the history of IT. New systems that begin to fulfill some of the earliest visions for what information technologies might accomplish — doing what we thought only people could do and machines could not —are now finally emerging.” - **Gartner** (link)

No matter what it is called, this shift in computing will change not only business processes, but entire industries

"In the history of our industry there have been some real major events that transformed the industry and had a huge impact in our lives. I believe that the next step is gonna be what's called cognitive computing." **- Hector Ruiz,** CEO of Advanced Nanotechnology Solutions (link)

"It has the potential to transform industries and professions everywhere." - **Ginni Rometty, IBM CEO** (link)

Hector Ruiz: The Evolution of Cognitive Computing



"The automation of knowledge work has the potential to become pervasive, transforming the economics of many industries, but also posing challenges and opportunities for technology providers, virtually all business leaders, individuals, and policy makers." - **McKinsey** (link)

"Forrester believes that cognitive computing has the potential to address important problems that are unmet with today's advanced analytics solutions." - **Forrester** (link)

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Potential Competitive Advantages await first movers who learn how to leverage advanced analytics and cognitive solutions.

"Smart machines deliver substantial first-mover advantage and we recommend early action." - **Gartner** (link)

"It is not only access to information, but the ability to analyze and act upon it, that creates competitive advantage." - **IDC** (link)

"Cognitive computing can provide competitive differentiation for businesses by empowering their people with fact -and experience- based insights and suggested guidance that results in better informed decisions." - **Ventana Research** (link)

IBM CEO Ginni Rometty: Gaining Competitive Advantage in the New Era of Computing


Building a Smarter Planet
A Smarter Planet Blog
IBM CEO Ginni Rometty: Gaining Competitive Advantage in the New Era of Computing
IBM CEO Ginni Rometty
In these early days of the 21st century, Big Data, analytics, cloud, mobile and social technologies are transforming our world. This new era of computing provides the instrumentation, interconnection and intelligence that make it possible to build a smarter planet. But, in order to do so, countries, cities, corporations and individuals need to rethink how they go about achieving their goals. Watch this video of IBM CEO Ginni Rometty laying out her vision of the path forward at the Council on Foreign Relations–and her Q&A session with the audience. Join the conversation here and on Twitter at #IBM and #CFRlive. Here's the speech.

"Significant competitive advantages await early adopters of smart advisors, starting in 2014; contextually aware intelligent personal assistants, starting in 2015; and, by 2020, advanced global industrial networks and early autonomous vehicles. IT leaders should act now as laggards will lose." - **Gartner** (link)

"Artificial intelligence isn't mainstream yet, but a wave of applications for AI is coming, and could give early adopters a significant competitive advantage." - **WSJ** (link)

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McKinsey says incremental productivity value of automating knowledge work could exceed $5.2 trillion economic impact by 2025

"It is possible that this incremental productivity—which does not include any estimate of the value of higher quality output due to better knowledge tools—could have as much as $5.2 trillion to $6.7 trillion in economic impact annually by 2025." - **McKinsey** (link)

McKinsey: Disruptive technologies: Advances that will tranform life, business and the global economy

"Advances in artificial intelligence, machine learning, and natural user interfaces (e.g., voice recognition) are making it possible to automate many knowledge worker tasks that have long been regarded as impossible or impractical for machines to perform." - **McKinsey** (link)

"Now is the time to begin planning for an era when the employee base might consist both of low-cost Watsons and of higher-priced workers with the judgment and technical skills to manage the new knowledge "workforce." - **McKinsey** (link)

On January 9, 2014, IBM announced the Watson Group, leading the entire I.T. Industry on the journey to Cognitive Systems

IBM Press Release: IBM Forms New Watson Group


News room > News releases >

IBM Forms New Watson Group to Meet Growing Demand for Cognitive Innovations

Headquartered in NYC's "Silicon Alley," New IBM Watson Group to Include Watson Innovation Hub, Fueling New Products and Start-ups

Watson Group Introduces New Cloud Solutions to Accelerate Research, Visualize Big Data and Enable Analytics Exploration

"Today is an important moment in our company's history. And It is also an important moment in the history of technology." - **Ginni Rometty, IBM CEO** (link)

"IBM has transformed Watson from a quiz-show winner, into a commercial cognitive computing breakthrough that is helping businesses engage customers, healthcare organizations personalize patient care, and entrepreneurs build businesses." - **Michael Rhodin, Senior Vice President, IBM Watson Group** (link)

Video: IBM Watson Group Launch Event Jan. 9 in New York (120 minutes)

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What is Watson? It signals a new era of computing where computers interact with users in order to improve decision making

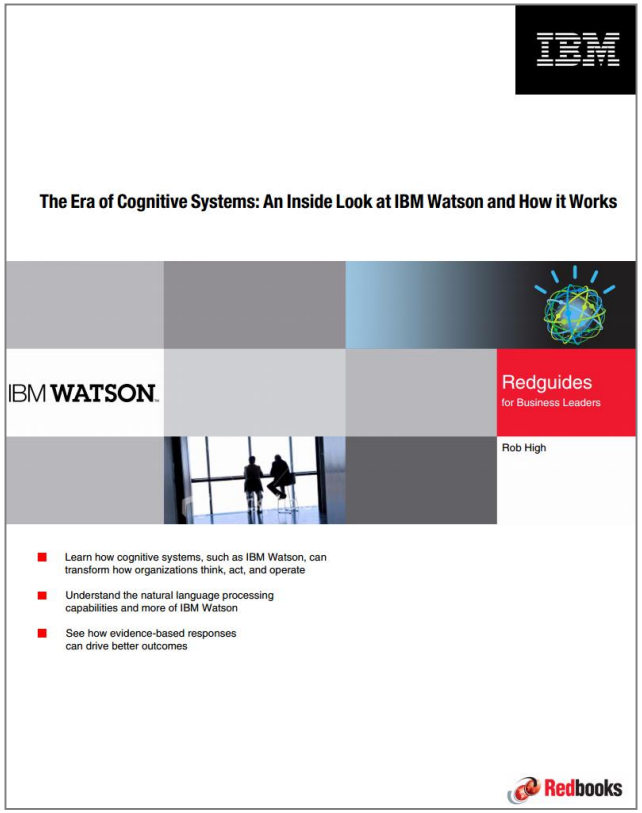
"Watson is an artificial intelligence computer system capable of answering questions posed in natural language" – **Wikipedia** (link)

"The combination of the following capabilities makes Watson unique:

- ***Natural language processing*** *by helping to understand the complexities of unstructured data, which makes up as much as 80 percent of the data in the world today.*
- ***Hypothesis generation and evaluation*** *by applying advanced analytics to weigh and evaluate a panel of responses based on only relevant evidence*
- ***Dynamic learning*** *by helping to improve learning based on outcomes to get smarter with each iteration and interaction"*

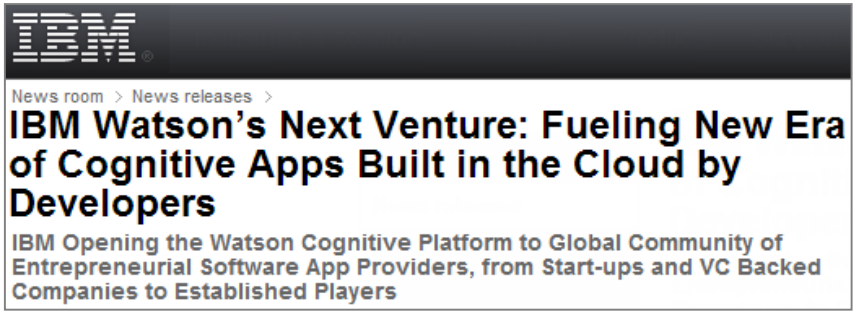
  - **IBM Redbooks** (link)

IBM Redbooks: The Era of Cognitive Systems: An Inside Look at IBM Watson and How it Works



IBM has opened up the Watson platform to developers in a move that will enable a whole new era of cognitive related apps

Press Release: IBM Watson's Next Venture


News room > News releases >

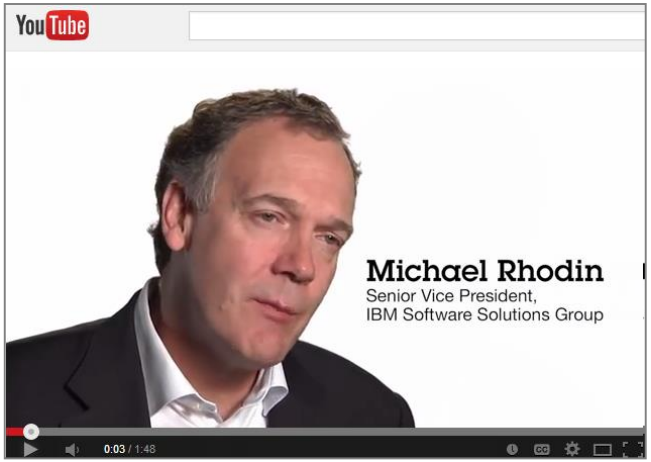
IBM Watson's Next Venture: Fueling New Era of Cognitive Apps Built in the Cloud by Developers

IBM Opening the Watson Cognitive Platform to Global Community of Entrepreneurial Software App Providers, from Start-ups and VC Backed Companies to Established Players

"With this move, IBM is taking a bold step to advance the new era of cognitive computing. Together with our partners we'll spark a new class of applications that will learn from experience, improve with each interaction and outcome, and assist in solving the most complex questions facing the industry and society." - **Michael Rhodin, Senior Vice President, IBM Watson Group** (link)

"The significance here is that IBM will enable other companies, large and small, to embed access to Watson into their products and services, or better yet, to build applications on top of it. This could bring about a paradigm shift not only in how people interact with computers, but in how we live our lives." **Mohamad Makhzoumi, Partner at New Enterprise Associates and board member at Welltok.** (link)

Video: IBM Watson is Fueling a New Era of Cognitive Apps



Learn more about Cognitive Computing and Watson from IBM Leaders

Video: Grady Booch: Innovation in Cognitive Computing

Video: An Evening with IBM Research's Dr. John Kelly

Video: Manoj Saxena discusses the future of IBM Watson

Video: Mike Rhodin on IBM Watson Group Announcement

Watson will open up new opportunities for advanced decision support applications, transforming industry business processes.

Video: Frost & Sullivan Applauds IBM Watson for Ushering in the Next Generation of Cognitive Systems

Putting Watson to Work (link)

Video: IBM Watson for Healthcare: Voice of the Doctor

Video: IBM Watson at Work in Finance: Helping Planners Analyze Data

Video: Announcing the IBM Watson Engagement Advisor

"Imagine having the ability to take in all the information around a patient's medical care -- symptoms, findings, patient interviews and diagnostic studies. Then, imagine using Watson analytic capabilities to consider all of the prior cases, the state-of-the-art clinical knowledge in the medical literature and clinical best practices to help a physician advance a diagnosis and guide a course of treatment." – **Wellpoint (link)**

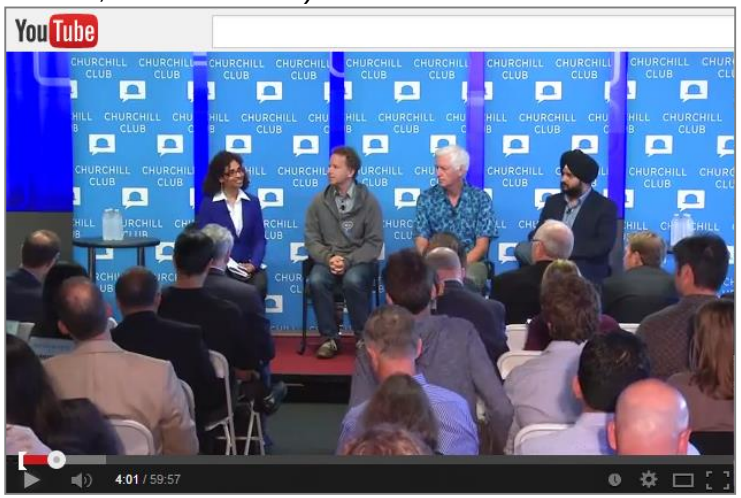
"CIOs and IT executives will think differently about ways to improve human decision processes, and reduce costs and cycle times. It will also require them to add new sets of skills, methods and tools within their IT organization." – **Manoj Saxena, GM, IBM Watson Solutions (link)**

Other IT industry players and consultants also have a perspective on the emerging Cognitive Computing era

"If companies take full advantage of intelligent automation, the overall impact on business could rival that of the enterprise resource planning wave of the 1990s." **– Deloitte** (link)

"Cognitive computing can, and will, bring benefits to many industries, and it will fundamentally change the ways in which many businesses operate." **– Accenture** (link)

Churchill Club Video: Machine Learning: Hottest Tech Trend in the Next 3-5 Years?
(panel discussion with execs from Kaggle, Google, Avasdi, and Accenture)



"Cognitive computing, inspired by how the human brain works, has the potential to revolutionize visually-based information analytics, leading to exciting applications in a wide range of domains, including surveillance, location-based services, healthcare safety, fraud detection, sentiment analysis or big data processing and visualization." **– HP** (link)

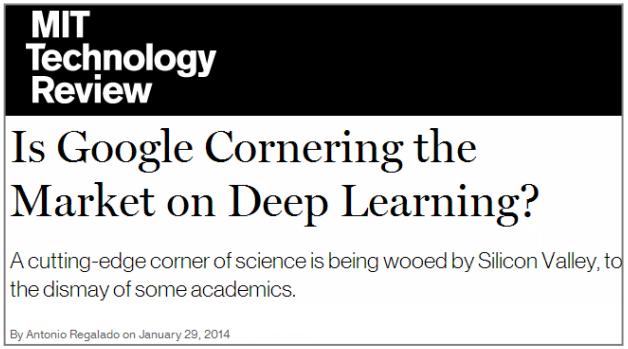
Google is very active in Artificial Intelligence, Robots, and related topics. It will be a strong player in the Cognitive Computing Era

"We believe quantum computing may help solve some of the most challenging computer science problems, particularly in machine learning." **– Google** (link)

"Understanding natural language is at the core of Google's work to help people get the information they need as quickly and easily as possible." **– Google** (link)

Video: Artificial Intelligence with Peter Norvig is Director of Research at Google,

MIT Technology Review: Is Google Cornering the Market on Deep Learning?

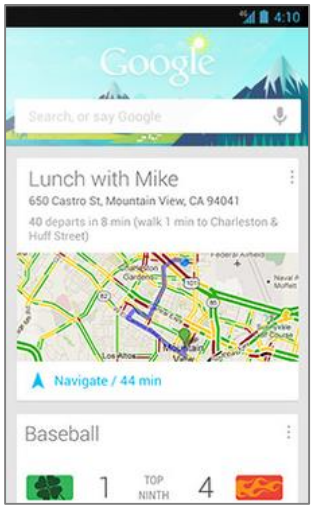


WIRED: Meet the Man Google Hired to Make AI a Reality

Siri and Google Now offerings are early, very basic versions of future personal intelligent agents. However…

Website: Apple Siri
Wikipedia: Siri

Website: Google Now
Wikipedia: Google Now



Forbes: Google Now Catching Up To Apple's Siri, Though Both Need To Build Stronger Voices


Forbes
TECH | 12/10/2013 @ 2:23PM | 5,618 views
Google Now Catching Up To Apple's Siri, Though Both Need To Build Stronger Voices

"Voice-controlled intelligent assistants offer a tantalizingly productive vision of end user computing." - **Forrester** (link)

…These offerings will eventually impact the Enterprise Cognitive Computing marketplace

" Gartner expects individuals will invest in, control and use their own smart machines to become more successful. Enterprises will similarly invest in smart machines. Consumerization versus central control tensions will not abate in the era of smart-machine-driven disruption. If anything, smart machines will strengthen the forces of consumerization after the first surge of enterprise buying commences". **– Gartner** (link)

Many industry watchers are expecting a 2014 announcement by Microsoft around an offering code-named Cortana

"Our UI will be deeply personalized, based on the advanced, almost magical, intelligence in our cloud that learns more and more over time about people and the world. Our shell will natively support all of our essential services, and will be great at responding seamlessly to what people ask for, and even anticipating what they need before they ask for it." **– Steve Ballmer, Microsoft CEO** (link)

"We have had internal debates about when to ship something. We could come out with something now like them (Apple & Google), but it wouldn't be state of the art. It's too constrained to be an agent now. We are not shipping until we have something more revolutionary than evolutionary." **– Stefan Weitz, Bing** (link)

"Cortana will be voiced by Jen Taylor & will launch first in beta on Lumia this April for US developers. The service will expand to the Bing app for iPhone in the US market this fall." **– MSFTnerd** (link)

ZDNet: 'Cortana': More on Microsoft's next-generation personal assistant

Forbes: Report: 'Cortana' Is Microsoft's Response To Siri

Tech Radar: Cortana: everything you need to know about Microsoft's Siri rival

Cognitive Computing – Trend Overview

We are fast-approaching a new era of computing called cognitive computing. This new era is not an incremental change. It signifies a fundamental shift in how machines interact with us and the environment.

Drivers

- Advances in enabling technology areas (see box to right)
- Large complex datasets can be the source of major insights and hold the answers to critical questions
- Third computing platform – Cloud, Mobile, Analytics, Social

Challenges

- Much more work on enabling technologies required
- Impact on business applications and processes not yet fully understood
- Education / Concerns about future "Skynet"
- Window of Opportunity: Partnerships / Ecosystems

Implications

- This is a technology that learns. Accuracy will increase over time.
- First movers will have an advantage.
- Cognitive systems and services will be available via cloud delivered services and therefore, cognitive capability will be delivered via any mobile device
- It is technology directed at helping individuals, not departments. Thus expect a mass market to develop around consumers.
- It will be highly disruptive.
    - Industries will be transformed.
    - Business processes will be transformed.
    - Changes required in employee workforce, corporate culture, and partner ecosystems.
    - New IT architectures, systems design, data management/analytics and workload optimized systems.
    - Scenario planning needed to understand long term implications for mass displacement of knowledgeworkers

Ventana Research The Potential of Cognitive Computing Platforms

Enabling Technologies

- Natural Language Processing
- Semantic Analysis
- Information Retrieval
- Automated Reasoning
- Machine Learning
- Artificial Intelligence

What is Cognitive Computing? Some definitions found on Wikipedia

*"A **cognitive computer** is a proposed computational device with a non-Von Neumann architecture that implements Hebbian learning".* – **Wikipedia** (link)

*"**Artificial intelligence** (AI) is the intelligence exhibited by machines or software, and the branch of computer science that develops machines and software with intelligence.".* – **Wikipedia** (link)

*"**Machine learning**, a branch of artificial intelligence, concerns the construction and study of systems that can learn from data."* – **Wikipedia** (link)

*"In artificial intelligence, an **intelligent agent** (IA) is an autonomous entity which observes through sensors and acts upon an environment using actuators (i.e. it is an agent) and directs its activity towards achieving goals (i.e. it is rational)."* – **Wikipedia** (link)

*"**Human–computer interaction** (HCI) involves the study, planning, and design of the interaction between people (users) and computers.."* – **Wikipedia** (link)

*"**Natural language processing** (NLP) is a field of computer science, artificial intelligence, and linguistics concerned with the interactions between computers and human (natural) languages."* – **Wikipedia** (link)

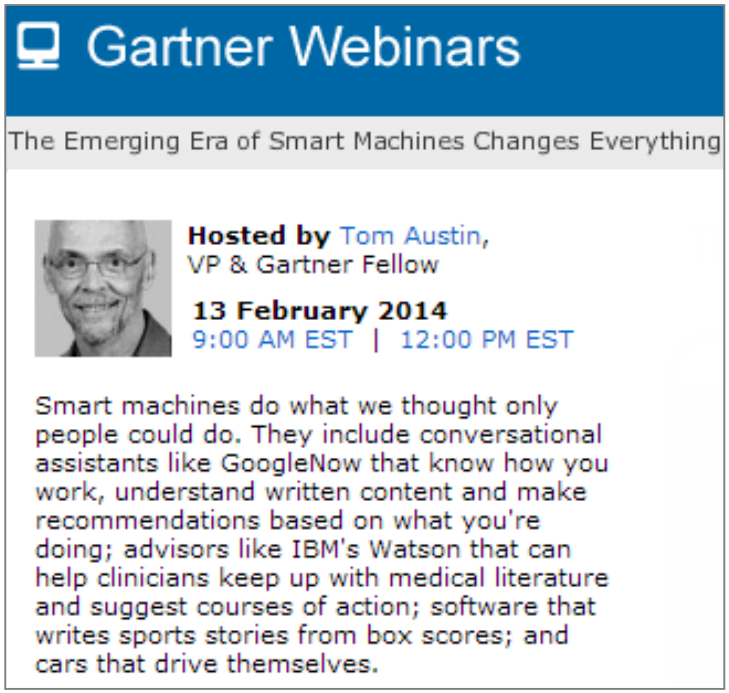
*"A **cognitive model** is an approximation to animal cognitive processes (predominantly human) for the purposes of comprehension and prediction."* – **Wikipedia** (link)

*"**Automated reasoning** is an area of computer science and mathematical logic dedicated to understanding different aspects of reasoning. The study of automated reasoning helps produce software that allows computers to reason completely, or nearly completely, automatically."* – **Wikipedia** (link)

Cognitive Computing – Selected Analyst Websites and Resources

- Forrester: Artificial Intelligence (search)
- Frost & Sullivan: Artificial Intelligence (search)
  - Artificial Intelligence -- Emerging Trends and Applications (Technical Insights)
- Gartner: Smart Machines (search)
  - Gartner Says Smart Machines Will Have Widespread and Deep Business Impact Through 2020
  - Gartner's 2013 Hype Cycle for Emerging Technologies Maps Out Evolving Relationship Between Humans and Machines
- IDC: Intelligent Systems (search)

Gartner Webinar: The Emerging Era of Smart Machines Changes Everything



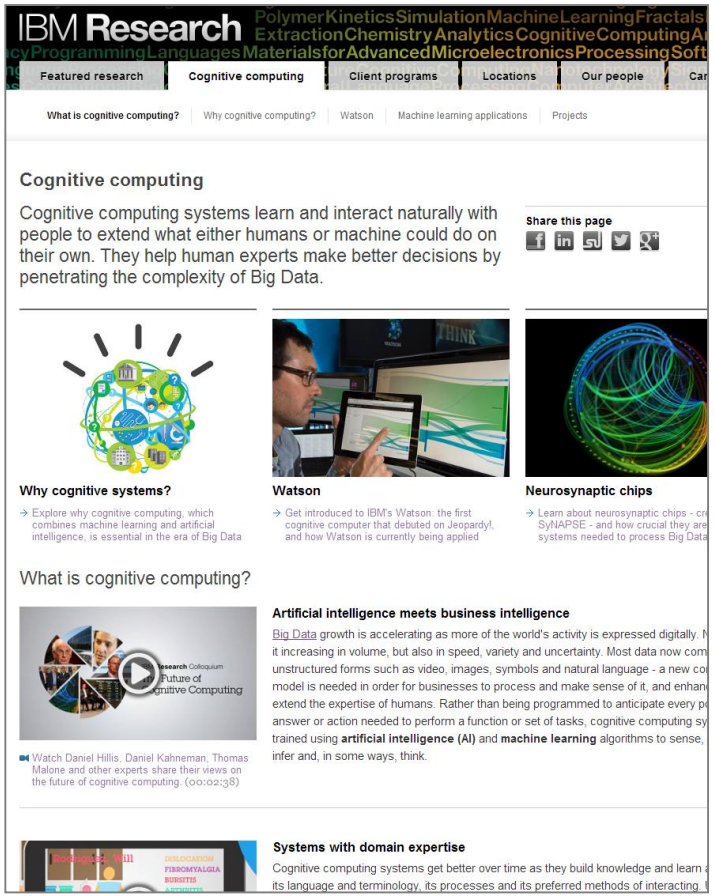
"Cognitive computing listens, learns, converses, and makes recommendations based on evidence." - **Forrester** (link)

"People interacting with machines through transparent computing, machines autonomously interacting with other machines, and people and machines interacting with the cloud and mobile infrastructure put intelligent systems at the edge, in the infrastructure, and in between." - **IDC** (link)

Cognitive Computing – Selected IT Vendor and Consultant Websites and Resources

- Accenture: Advanced Analytics
- Deloitte: Cognitive Computing: Can Computers Learn from Experience? (Webinar) and Deloitte University Press (search)
- Google: Launching the Quantum Artificial Intelligence Lab / Artificial Intelligence and Machine Learning / Natural Language Processing / Human-Computer Interaction and Visualization
- HP: Intelligent Infrastructure / A perspective on the use of machine learning in management of complex applications
- IBM: Cognitive Computing / Watson
- Infosys: Machine Learning
- Microsoft: Head of Microsoft Research Peter Lee discusses Microsoft's use of artificial intelligence / Machine Learning / Intelligent Systems / Top Authors in Artificial Intelligence
- Oracle: Advanced Analytics
- SAS: Machine Learning
- Tata Consultancy Services: Application of Artificial Intelligence in Insurance Customer Interactions
- Wipro Blogs tag: Artificial Intelligence

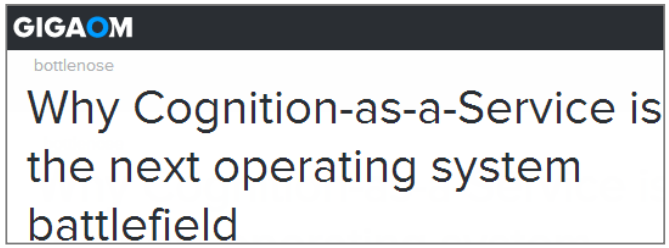
IBM Research: Cognitive Computing



Cognitive Computing: Selected Media Websites, Resources & Articles

- Businessweek: The Future of Big Data, Apps, and Corporate Knowledge / Artificial Intelligence (search)
- CIO.com: IBM Looks to Outsmart Big Data Competition With Watson / Big Data
- ComputerWorld: Big Data / Business Intelligence Analytics / Cognitive Computing (search)
- eWeek: Cognitive Computing (search) / Artificial Intelligence (search)
- Forbes: Three Ways Cognitive Computing Will Transform Business Leaders / Cognitive Computing (search) / Artificial Intelligence (search)
- GIGAOM: Cognitive Computing (search)
- Harvard Business Review: The Last Thing We Want is Real Artificial Intelligence
- InformationWeek: Cognitive Computing (search) / Artificial Intelligence (search)
- InfoWorld: Cognitive Computing (search) / Artificial Intelligence (search):
- The Atlantic: The Man Who Would Teach Machines to Think
- Wired: Artificial Intelligence

GIGAOM Why Cognition-as-a-Service is the next operating system battlefield



Forbes: Three Ways Cognitive Computing Will Transform Business Leaders

Selected IBM Websites, resources and links

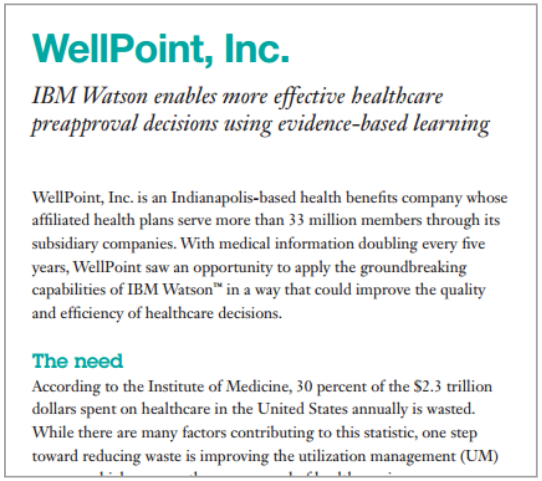
ibm.com links

- IBM Watson
  - Watson in Healthcare
  - Watson in Finance
  - Watson for Engagement
- SmarterPlanet: Watson
- 5in5 videos – Machine Learning Applications
- IBM Research: Cognitive Computing / The DeepQA Project

IBM Social Media Platforms

- Twitter: @ibmwatson (33,212 followers)
- Twitter hasthag #ibmwatson
- Linkedin: Watson Advocates
- Facebook: IBM Watson (43,000 fans)
- YouTube: IBMWatsonSolutions
- YouTube IBM Channel: Watson Playlist
- Manoj Saxena, GM Watson Solutions http://twitter.com/#!/manojsaxena
- Dharmendra S Modha's Cognitive Computing Blog

Case Study: WellPoint, Inc.



WellPoint, Inc.

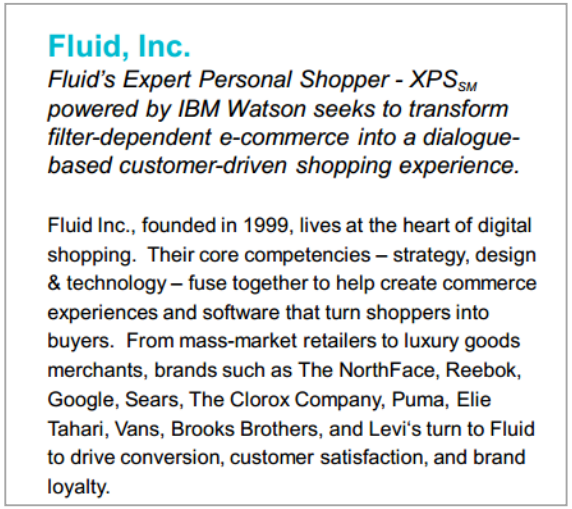
IBM Watson enables more effective healthcare preapproval decisions using evidence-based learning

WellPoint, Inc. is an Indianapolis-based health benefits company whose affiliated health plans serve more than 33 million members through its subsidiary companies. With medical information doubling every five years, WellPoint saw an opportunity to apply the groundbreaking capabilities of IBM Watson™ in a way that could improve the quality and efficiency of healthcare decisions.

The need

According to the Institute of Medicine, 30 percent of the $2.3 trillion dollars spent on healthcare in the United States annually is wasted. While there are many factors contributing to this statistic, one step toward reducing waste is improving the utilization management (UM)

Case Study: Fluid, Inc



Fluid, Inc.

Fluid's Expert Personal Shopper - XPS℠ powered by IBM Watson seeks to transform filter-dependent e-commerce into a dialogue-based customer-driven shopping experience.

Fluid Inc., founded in 1999, lives at the heart of digital shopping. Their core competencies – strategy, design & technology – fuse together to help create commerce experiences and software that turn shoppers into buyers. From mass-market retailers to luxury goods merchants, brands such as The NorthFace, Reebok, Google, Sears, The Clorox Company, Puma, Elie Tahari, Vans, Brooks Brothers, and Levi's turn to Fluid to drive conversion, customer satisfaction, and brand loyalty.

IBM Watson & Cognitive Computing related videos found on the Internet

1. The Future of Cognitive Computing (3 min.), by IBM Research, Jan 2014
2. IBM Watson Inspires Millennials to Seek Cognitive Computing Career (2min), by IBM, Jan 2014
3. Cognitive Computing for Utilities (50 min.), by citrisuc, Jan 2014
4. Innovation in Cognitive Computing – Grady Booch (3 min), by IBMSocialMedia, Jan 2014
5. Hector Ruiz: The Evolution of Cognitive Computing (5 min.) by Big Think, Jul 2013
6. AoT Big Brains Event: New Ways of Thinking With Cognitive Computing (10 min.), Nov 2013
7. Elementary, Watson: The Rise of the Anthropomorphic Machine(4 min), by Big Think, Nov 2013
8. IBM General Mgr. Manoj Saxena discusses the future of IBM Watson (25 min), by IBM Enterprise Conference, Oct 2013
9. IBM InterConnect 2013: Ginni Rometty - A New Era of Smart (23 min), by IBMSoftware, Oct 2013
10. Zachary Lemnios on Cognitive Computing (2 min.) by IBMSocialMedia, Sept 2013
11. IBM Research's John Kelly: The Three Eras of Computing (4 min.), by IBM Research, Sept 2013
12. A new software ecosystem for cognitive systems (3 min), by IBM Research, Aug 2013
13. Dharmendra Modha – Cognitive Computing (33 min.), by GIGAOM, Aug 2013
14. TED: Cognitive Computing (Eric Brown) (2 min.), by IBM, Aug 2013
15. Manoj Saxena - Cognitive Computing Overview: The Next Big Thing (8 min.), by Fourth-Floor South, Jul 2013
16. California Cognitive Science Conference 2013: David Ferrucci (64 min), by CalCogSci, May 2013
17. Basit Chaudhry - Applying IBM Watson and Cognitive Computing to Healthcare (20 min.), by TEDMEDLive Bologna, May 2013
18. YouTube Channel: IBMWatsonSolutions
19. YouTube IBM Channel: Watson Playlist

Selected IBM publications and press releases

1. IBM Watson Ecosystem Program , by IBM, Nov 2013
2. IBM Watson Group: Technology to Transform Business and Society , by IBM, Jan 2014
3. IBM Forms New Watson Group to Meet Growing Demand for Cognitive Innovations Press Release, Jan 2014
4. IBM Watson Group Unveils Cloud-Delivered Watson Services to Transform Industrial R&D, Visualize Big Data Insights and Fuel Analytics Exploration, Press Release, Jan 2014
5. An Ecosystem of Innovation: Creating Cognitive Applications Powered by Watson, by IBM, Nov 2013
6. IBM Watson's Next Venture: Fueling New Era of Cognitive Apps Built in the Cloud by Developers, IBM Press Release, Nov 2013
7. Smarter Analytics: Taking the Journey to IBM Cognitive Systems, by IBM Redbooks, Oct 2013
8. A DevOps approach speeds IBM Watson solutions to market, by IBM, Oct 2013
9. How Watson helps answer big questions with Big Data, by IBM, June 2013
10. The Era of Cognitive Systems: An Inside Look at IBM Watson and How it Works, by IBM Redbooks, Dec 2012
11. Watson's Next Conquest: Business Analytics , by IBM, 2012

"It is taught, it is not programmed. By design it learns by experience. By design it learns from interaction. And by design it gets smarter over time and has better judgments over time." - **Ginni Rometty, IBM CEO** (link)

Selected articles, reports, and blog posts retrieved from the Internet

1. Intelligent automation: A new era of innovation, by Deloitte University Press, Jan 2014
2. 4 Ways That IBM's Watson Could Transform How Humans Think And Make Decisions, by Fast Company, Jan 2014
3. Transforming E-Commerce: The Introduction of Artificial Intelligence, Retail Info System News, Nov 2013
4. Artificial Intelligence and the Economy, by Charles Noussair, Tilburg University, Nov 2013
5. Principles of Cognitive Computing , by Earl Cox, Chief Scientist, Scianta Analytics LLC, Oct 2013
6. Big Data: Artificial Intelligence, European Commission, Sept 2013
7. The Future is Now: How Artificial Intelligence is Transforming Businesses (Blog), RIC Centre, Sept 2013
8. The Unexpected Places Where Artificial Intelligence Will Emerge, (Blog) io9.com, Sept 2013
9. Artificial Intelligence Is the Most Important Technology of the Future (Blog), Michael Anissimov, July 2013
10. Artificial Intelligence in Big Data, Commercial Apps, Mobility and Search, Market Reports Online, April 2013
11. The future of knowledge work, by Deloitte University Press, Jul 2013
12. Using Artificial Intelligence to Improve Hospital Inpatient Care, by Daniel Neill, Carnegie Mellon University, March/April 2013
13. IBM's Watson: From Winning Games to Saving Lives, by IDC, March 2012
14. The Potential of Cognitive Computing Platforms, by Ventana Research, Dec 2013
15. Cognitive Systems Redefine Business Potential , by Ventana Research, 2012
16. IBM Bets a Billion to Mobilize Watson Business Unit and Monetize Cognitive Computing, by Ventana Research, Jan 2014
17. The Era of Cognitive Computing, by Irving Wladawsky-Berger, July 2013
18. Cognitive Systems and Big-Data-driven Applications, by Irving Wladawsky-Berger, July 2013

Selected videos on Artificial Intelligence, Machine Learning, HCI and other topics found on the Internet

1. Learn Machine Learning in 1 minute (1 min), by Guru99, Jan 2014
2. Meet Facebook's Head of Artificial Intelligence (2 min.), by Bloomberg, Jan 2014
3. Joscha Bach - How to Build a Mind - Artificial Intelligence Reloaded(56 min), by CCCen, Dec 2013
4. Future Talk #32, Artificial Intelligence with Peter Norvig (28 min), by Martin Wasserman, Nov 2013
5. Google and NASA's Quantum Artificial Intelligence Lab (7 min.), by Google, Oct 2013
6. Artificial Intelligence vs. Intelligence Amplification – Dr. Yoav Freund (33 min), by Calit2ube, Oct 2013
7. The Future of Human-Computer Interaction: How Will We Connect? (85 min) , by Churchill Club, Aug 2013
8. Machine Learning: Hottest Tech Trend in the Next 3-5 Years?(60 min), by Churchill Club, Aug 2013
9. The Rise of Artificial Intelligence (9 min), by PBSoftbook, Jul 2013
10. A Gentle Introduction To Machine Learning (18 min), by EnthoughtMedia, Jul 2013
11. Michael Anissimov - Artificial Intelligence - Progress Towards Safe AI (60 min), by Adam Ford, Jun 2013
12. The Age of Artificial Intelligence: George John (20 min), by TEDxTalks, May 2013
13. The Future of Healthcare: Artificial Intelligence & Clinical Support Systems (panel)(60 min.), by StandfordBusiness, Apr2013
14. Mark Woodwell - Building a Business on Artificial Intelligence (42 min.), by NC State, Mar 2013
15. How To Create A Mind: Ray Kurzweil (22min), by TEDxTalks, Mar 2013
16. Jeff Hawkins: Building Brains to Understand the World's Data(62 min), GoogleTechTalks, Mar 2013
17. Making Friends With Artificial Intelligence: Eric Horvitz (24 min.), TEDxTalks, Feb 2013
18. Intelligence and Machines: Creating Intelligent Machines(by Modeling the Brain,(88 min), by University of California Television, Dec 2012
19. The Challenge and Promise of Artificial Intelligence (53 min), by ComputerHistory, Jul 2012
20. Alan M. Turing Centenial Conference – Israel (playlist), by Google Tech Talks, April 2012

Appendix: About The IBM HorizonWatch Community

- HorizonWatch is an ***IBM internal community*** in place since January 2001
- Our focus is on learning about and sharing our knowledge on emerging trends, business issues, and technologies so we can
  - Develop better strategies for the future
  - Help our customers develop better strategies for the future
- For more on the internal IBM HorizonWatch Community send an email to Bill Chamberlin, IBM HorizonWatch Community Leader at whchamb@us.ibm.com