



AI – THE NEW BI & MORE

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HISTORY OF BUSINESS INTELLIGENCE

- Term first used by Richard Millar Devens' in the 'Cyclopædia of Commercial and Business Anecdotes' in 1865
 - Devens used the term to describe how the banker, Sir Henry Furnese, gained profit by receiving and acting upon information about his environment, prior to his competitors
- IBM researcher, [Hans Peter Luhn](#), used the term in 1958
 - He employed the Webster's dictionary definition: "the ability to apprehend the interrelationships of presented facts in such a way as to guide action towards a desired goal"
- In 1989, Howard Dresner (later a [Gartner](#) analyst) proposed it as an umbrella term to describe "concepts and methods to improve business decision making by using fact-based support systems"

BUSINESS INTELLIGENCE TODAY

- While the use of BI has been fairly consistent for over 100 years, it is only through AI, artificial intelligence, that BI can truly achieve its real value in the ability to use data to not just provide analysis but *prescriptive, actionable information*
- While BI has produced thousands of pretty graphics about businesses it has all been descriptive data that explains the what but not the why or how
- It is only by applying AI that BI can produce the ***prescriptive output*** about a business, science, or segment of life that is desired and actionable

BUSINESS INTELLIGENCE CHARTS



AI-DRIVEN BI EXAMPLE

- A company had been using BI to try to understand and grow its profits
- Traditional BI revealed that the more the company advertised, the more the company sold, so marketing expenses increased dramatically
- This led to too much spending on advertising, which led to increased sales, but significantly reduced profitability
- The company then hired an AI firm to analyze the same data and got very specific prescriptive, actionable information
- AI revealed that 90% of the company's sales occurred on days that it rained or was forecast to rain

AI-DRIVEN BI EXAMPLE

- This BI was *prescriptive* rather than descriptive
- The AI program forecast that by only advertising on the radio on those days that it rained or was forecast to rain would reduce radio advertising cost by 70% while still achieving growth in new sales
- Since radio advertising must be purchased 10 days in advance, the company then used AI to forecast the weather 10 days in advance and purchased ads only on those days that were forecast for rain
- This AI-driven BI led to not just increased sales, but a dramatic increase in profits, by also reducing costs

AI IN MEDICINE

- Doctors had been unable to understand how to prevent blindness in diabetic patients
- AI was fed all the data doctors had accumulated and AI identified with 98% accuracy what surgery to perform on which patients to prevent diabetic blindness
- This is an amazing example of using the same AI-driven BI in a specific medical field to produce prescriptive, actionable information that could not be found without AI
- Patients are now getting screened for the potential of developing diabetic blindness and then to identify the surgery needed to prevent the blindness
- Prescriptive, actionable information!

AI QUOTES

- “Just like electricity transformed almost everything 100 years ago, today I actually have a hard time thinking of an industry that I don’t think AI will transform in the next several years.”
 - *Andrew Ng, Chief Scientist, Baidu*
- “If you don’t have an AI strategy, you are going to die in the world that is coming.”
 - *Devin Wenig, CEO eBay*
- “This 18-month period...is when the AI community woke up and took itself seriously and thought about what to do to make the future better.”
 - *Stuart Russell, Computer Science Professor at UC Berkeley*

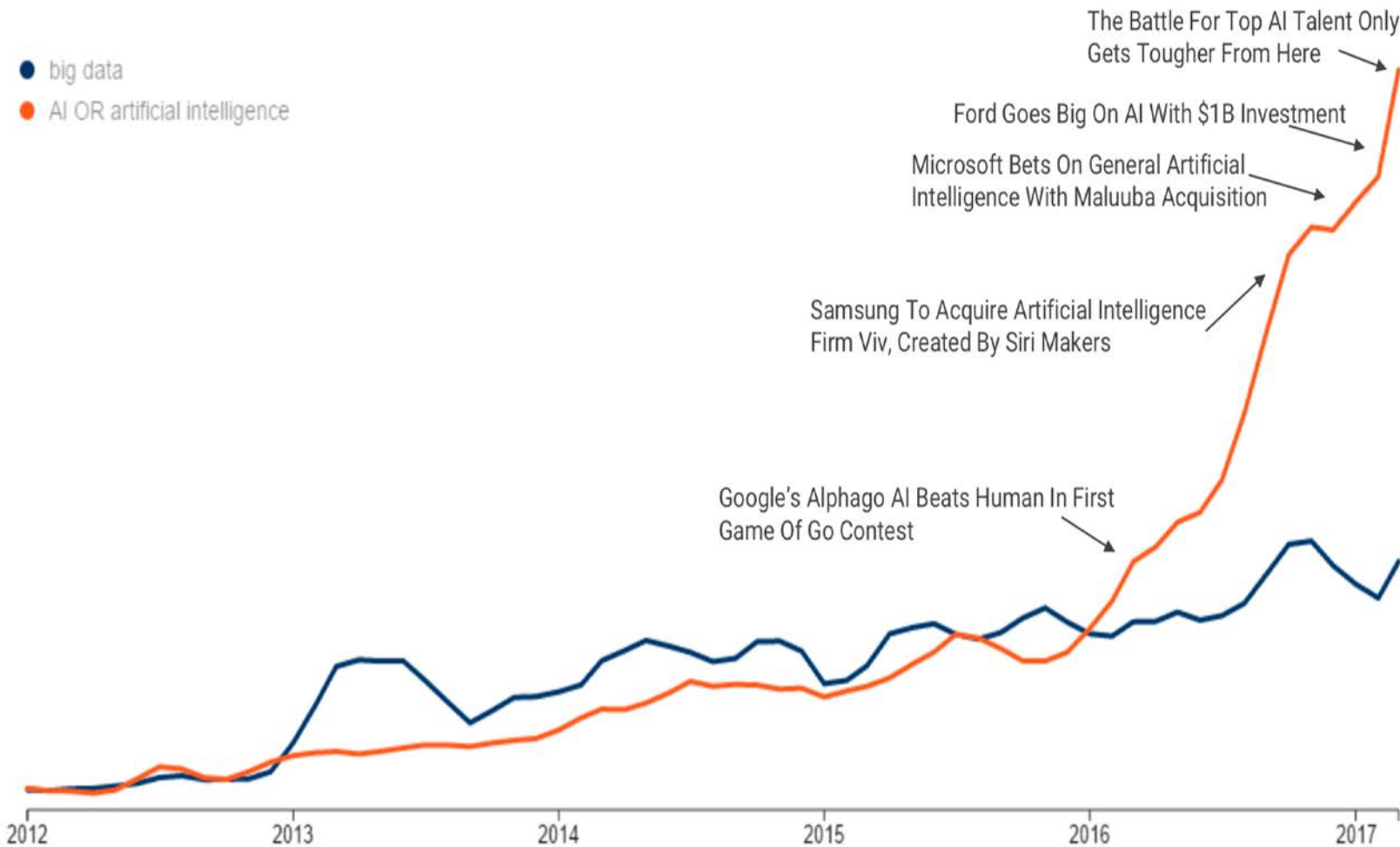
AI QUOTES

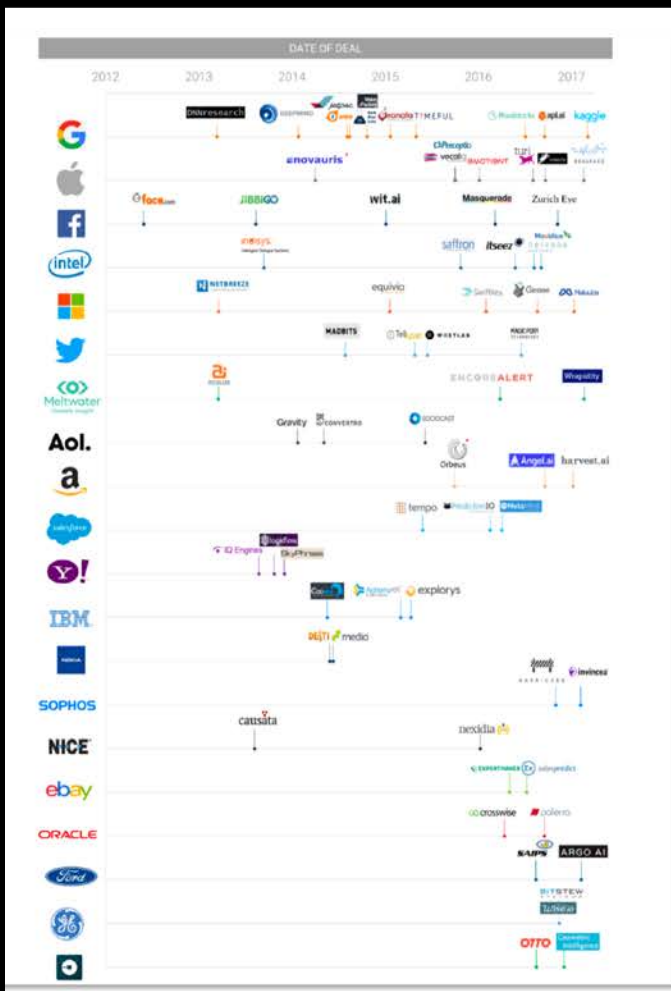
- "Society is being transformed on a spectacular scale. Machines that sense, reason, and act can accelerate solutions to large-scale problems and push science, finance, medicine, and education further, faster. AI is at the heart of much of today's technical innovation."
 - *Brian Krzanich, CEO, Intel*
- "We are the ones that woke up the AI world...the key to IBM, a century-old company, remaining an institution in this country is how many times it has been able to reinvent itself and follow the latest trends in tech. Today, those trends are the cloud and artificial intelligence."
 - *Ginni Rometty, CEO, IBM*

WHY IS AI SO DIFFERENT?

- Probably 1000 reasons exist, but let's focus on just one
- Traditional BI provides descriptive information with pretty charts and graphs, but rarely leads to actionable information
- Traditional BI is descriptive rather than prescriptive
- AI looks at the same data but rather than categorizing, summarizing, and displaying data, AI produces prescriptive, actionable information about how to create a desired result
- **AI produces *prescriptive information*, which is dramatically changing business, science, medicine, and more**

MEDIA TRENDS: AI VS BIG DATA





RACE FOR INTELLIGENCE

Google, Facebook, Apple, Intel and other big corporations acquiring AI startups

200+

Acquisitions since 2012

30+

M&A deals in
Q1'17

11

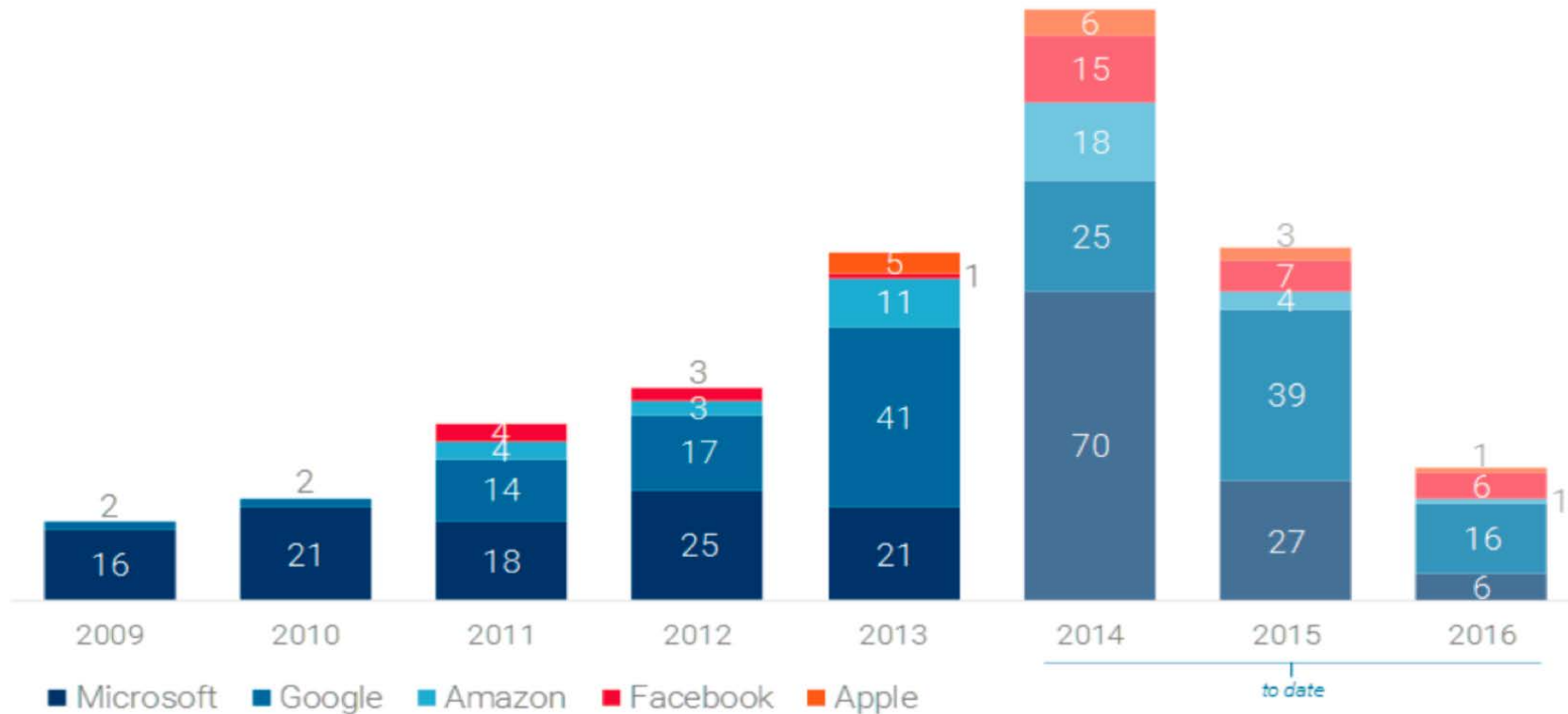
Acquisitions by
Google

Google is the most active acquirer of AI startups, having acquired 11 startups since 2012. Apple, which has been ramping up its M&A efforts, ranked second with 7 acquisitions under its belt. Newer entrants in the race include Ford, which acquired Argo AI for \$1B in Q1'17, cybersecurity company Sophos, and Amazon.

AI PATENTS OF MICROSOFT, GOOGLE, AMAZON, FB, APPLE

as of 12/12/2016

Note: IBM filed more patents on AI than all these companies combined




WHY TIMING IS RIGHT FOR AI

Big Data + Processing Power =
New Age for
Artificial Intelligence

HORSEPOWER FOR AI: NVIDIA GPU'S DOMINATE MARKET

NVIDIA GPUs, which initially targeted the gaming industry, are now widely used for training deep neural networks.

Other big corporations like Intel and Google have focused their efforts on AI chips as well, with Intel recently acquiring startup Nervana Systems, and Google developing a custom chip called "Tensor Processing Unit."



A DGX-1 computer

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WORLD'S FIRST AI SUPERCOMPUTER IN A BOX

AI at the Edge

High-performance, low-power NVIDIA Jetson TX2 enables on-device complex data processing in everything from robots and drones to self-driving cars, autonomous vehicles, and intelligent cameras.

256-core NVIDIA Pascal™ architecture and 8 GB of memory deliver over 1 TeraFlops of performance, 64-bit CPUs, and 4K video encode/decode capabilities.

Power efficiency at just 7.5 watts



Accelerator for PCs

Supercharge your desktop development system with the new NVIDIA TITAN X GPU. Powered by the world's most advanced GPU architecture, NVIDIA Pascal™, the TITAN X delivers 11 GFLOPS of parallel computing performance and is packed with 3584 NVIDIA® CUDA® cores and 12GB of GDDR5X memory.

[READ STORY](#)

DATA PLUS PROCESSING POWER

- AI has been delayed by lack of data and processing power
- Big Data focus of the past ten years has resolved the issue of enough data
- **We are producing 300 million gigabytes of data per day and that has been doubling every two years**
 - IOT is expected to produce more data per day in two years than all other sources of data
 - 300M gigabytes per day in two years will be 1.2B gigabytes per day
 - IOT will also produce another 1.2B gigabytes per day
- Processing power has been resolved with rapidly advancing CPUs and GPUs
- GPUs and other specialized processors working together in vastly multiprocessor computers produces enough processing power for AI to succeed today

A few AI applications today

A LOT OF NUMBER CRUNCHING

BUSINESS INTELLIGENCE

IOT PREDICTIVE
MAINTENANCE

SEARCH RECOMMENDATIONS

FORECASTING MODELS

VISION

AUTO TECH AND DRONE
COLLISION AVOIDANCE

E-COMMERCE SEARCH

PICK AND PLACE ROBOTS

HEALTHCARE DIAGNOSTICS

LANGUAGE PROCESSING

CHATBOTS

NEWS & MEDIA
CONTENT CREATION

SMART HOME VOICE
INTERFACES

TEXT ANALYTICS

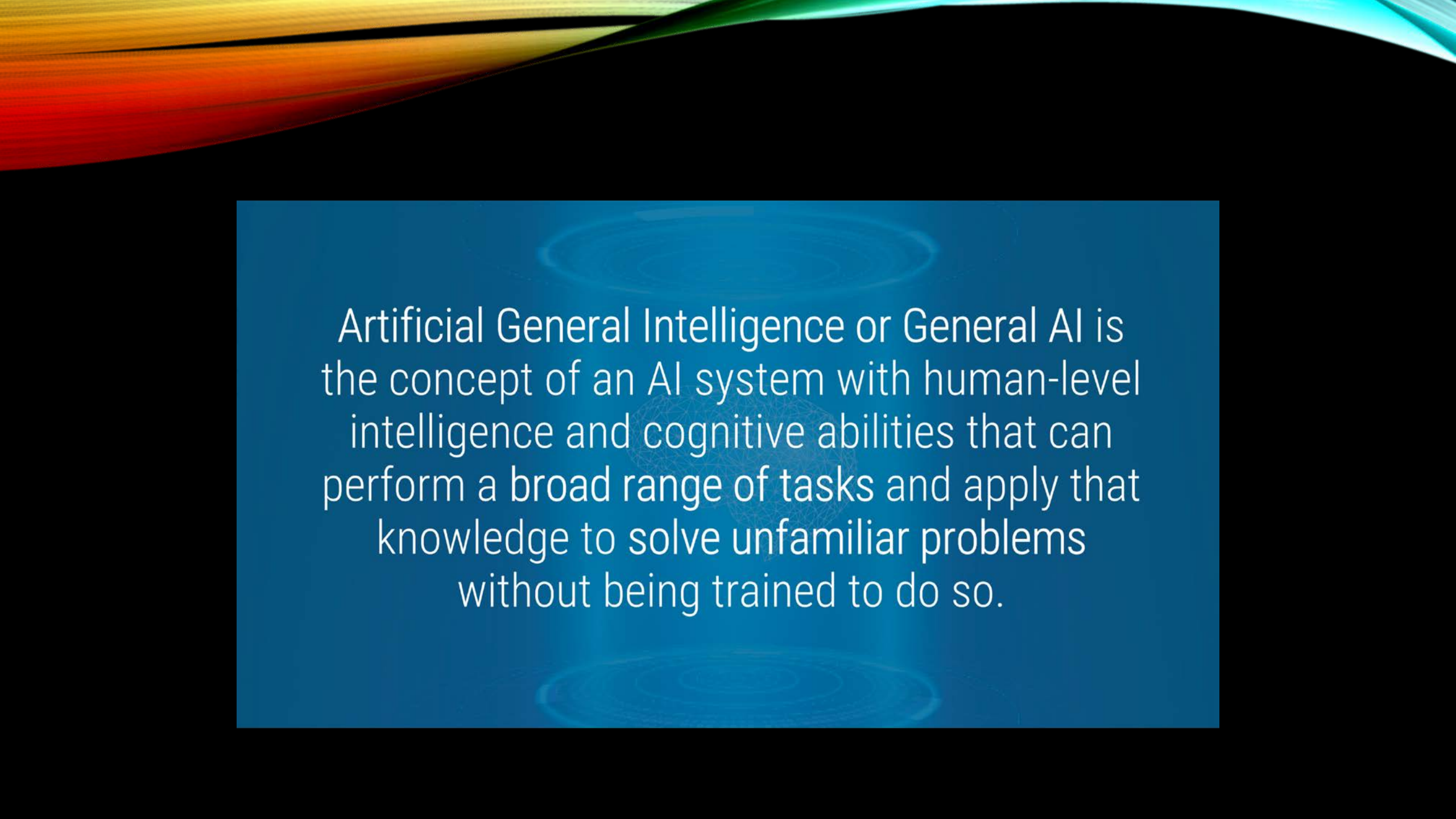


AI Equity Funding Since 2012:

\$15.4 BILLION

across

2320 DEALS



Artificial General Intelligence or General AI is the concept of an AI system with human-level intelligence and cognitive abilities that can perform a broad range of tasks and apply that knowledge to solve unfamiliar problems without being trained to do so.

AI SYSTEMS MARKET POTENTIAL

- IDC reports that revenues from Cognitive/AI systems will exceed \$47 Billion in 2020
- Gartner says that AI will create more new jobs than it eliminates in the next few years
- AI is the driving force behind self-driving automobiles
- AI is the driving force behind prescriptive new health care solutions
- AI is the driving force behind new voice and visual searchable web sites
- AI is the driving force behind user interface redesign, ex: Apple iPhone facial recognition
- AI is the driving force behind e-commerce
- AI is the driving force behind cybersecurity
- AI is the driving force behind Quantum computing by developing the operating systems and applications quantum computers will use to operate
- **AI is the driving force behind most technology advancements in all fields!**

AI AND SINGULARITY

- The constant discussion is will AI achieve Singularity, and if so, when
- The world is divided between the scientists and technologists who believe that AI will achieve singularity, and those who believe it won't
- On the believe it will side are people like Steven Hawking and Elon Musk
- On the believe it won't side are Mark Zuckerberg and Paul Allen
- Most technologists say it will happen in 30-40 years, including Google, Cisco, and others
- China is attempting to be the first to achieve singularity, and I think they will be successful by 2030, by combining AI and Quantum Computing
- Many experts say whoever wins in AI will win the world
- **China believes this to be true and is spending billions of dollars to achieve singularity first**

4TH INDUSTRIAL REVOLUTION

- 1st Industrial Revolution was steam and textiles in about 1765
 - Produced dramatic change and linear growth
- 2nd Industrial Revolution was electricity in about 1870
 - Produced dramatic change and linear growth
- 3rd Industrial Revolution was computing in about 1970
 - Produced dramatic change and linear growth
- 4th Industrial Revolution was combination of digital, physical and biological in about 2015
 - Is producing dramatic growth and exponential growth
 - Unprecedented rate of change
 - We will see more disruptive change in the next 10 years than we have seen in the past 40 years
- The combination of Quantum Computing and AI will be heard around the world