Seizing the AI opportunity

Brazilian American Chamber of Commerce
October 24, 2017, Miami

Raman Chitkara
Global Technology Industry Leader
My first experience with computers

Release date: March 1983

Cost: $3,590
30 years later
Artificial Intelligence today

Google Home

Amazon Echo

LingLong DingDong

Apple HomePod
Total skills / Voice apps June 30, 2017

Growing from 7000 as of January 3rd, 2017

Alexa skill growth was 37% times more than Google Home in June
Artificial intelligence tomorrow

2025/

2035

?
**Technological breakthroughs are advancing at an accelerating pace...**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Car" /></td>
<td><img src="image" alt="Blackberry" /></td>
<td><img src="image" alt="Analytics" /></td>
<td><img src="image" alt="3D printing" /></td>
</tr>
<tr>
<td><img src="image" alt="Airplane" /></td>
<td><img src="image" alt="IEEE 802.11 (WiFi)" /></td>
<td><img src="image" alt="Cloud" /></td>
<td><img src="image" alt="OTT" /></td>
</tr>
<tr>
<td><img src="image" alt="Satellite" /></td>
<td><img src="image" alt="Flash drives" /></td>
<td><img src="image" alt="Social" /></td>
<td><img src="image" alt="Big Data" /></td>
</tr>
<tr>
<td><img src="image" alt="www" /></td>
<td><img src="image" alt="iPod" /></td>
<td><img src="image" alt="Smartphone (Mobile)" /></td>
<td><img src="image" alt="Robotics" /></td>
</tr>
<tr>
<td><img src="image" alt="Televisions" /></td>
<td><img src="image" alt="GPS" /></td>
<td><img src="image" alt="Genomics" /></td>
<td><img src="image" alt="Blockchain" /></td>
</tr>
<tr>
<td><img src="image" alt="Computer" /></td>
<td><img src="image" alt="Drones" /></td>
<td><img src="image" alt="IoT" /></td>
<td><img src="image" alt="Wearables" /></td>
</tr>
</tbody>
</table>
...and are manifesting as a proliferation of technologies; we track over 150 of them
Key attributes of disruptive innovations

Every disruptive innovation has a broader impact than the previous one...

...and resulting changes happen faster
Which disruptions will have the greatest impact on...

Consumers

Business

Society
We believe these eight disruptive technologies will have the greatest near-term impact.
Key attributes of a titanic disruption

- It creates value where none existed
- It changes the user’s worldview and behaviour
- It alters who and what is connected
- Its impact is described as a new era for civilisation
Artificial intelligence

3D printing

Robots

Drones

Autonomous vehicles

Blockchain

Virtual reality/ Augmented reality

IoT
Artificial intelligence (AI) – the titanic disruption

AI will shape our lives more than any other technology in the next three decades and beyond.

AI will extend the boundaries of human intelligence that is not fully imaginable.

AI will create new challenges of cyber security, cyber wars, hacking & privacy.
AI products today
Impact on business
AI will impact all industries and businesses...

Healthcare
Industrial Manufacturing
Banking and capital markets
Public Sector
Retail and Consumer
Aerospace and defense
Private company industries
Automotive
Communications
Pharma and life sciences
Technology
Transportation and logistics
Private equity
Entertainment and media
Power and utilities

Communications

Technology

Power and utilities

Pharma and life sciences

Transportation and logistics

Private equity

Entertainment and media

Aerospace and defense

Retail and Consumer

Public Sector

Industrial Manufacturing

Banking and capital markets

Healthcare

Private company industries

Automotive

Communications

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology

Power and utilities

Pharma and life sciences

Technology
...as well as all elements of business

1. **Strategy**
   - CEO

2. **Customer engagement**
   - VP Sales
   - VP Mktg

3. **Manufacturing**
   - COO,
   - VP Mfg,
   - VP Procurement

4. **People and talent**
   - HR

5. **Finance**
   - CFO

6. **Compliance**
   - Legal & Audit
AI man-machine continuum

Sources: PwC “Leveraging the upcoming disruptions from AI and IoT”
Impact of AI

Disruptions

Crisis

Regulations
Nature of transformations resulting from AI disruptions

Disruption led transformations will be multiple...

...and their impact and focus will be global
**Likely impacts?**

*Disruption driven transformations will initially contribute to high value-high margin products which will eventually mature into low margin commodity products.*

*Companies will be constantly challenged to manage the transition from high value to commoditization of the products at a pace not seen historically and which they may not see coming.*
AI disruptions-led refocus

Profit maximization

Human capital development/optimisation

IP protection

Crisis management

Customer engagement/experience and revenue optimization

Cyber/Digital security
What are other likely impacts?

Greater use of AI in every job and service

Reduced demand for low-value, high-volume skills
Shift in work from low-value to high-value

Today

Low value

High value

Future

Low value

High value
Changing workforce needs

Reduced head count and higher productivity

Automation of low skilled jobs
Changing workforce hiring & development

Greater focus on human capital development

Rapidly changing skill sets – different hiring strategies
Dilemmas and Open Issues Associated with AI

- Morality
- Potential Misuse of AI for Terrorism
- Impact of AI on Future Human Development
- Man vs Machine debate
- AI and Social Values
- Human Toll from Use of AI in Wars
What’s happening now and in the not so distant future?
Data explosion is fueling AI

Number of devices connected to the Internet

- 2016: 11 B
- 2025: 80 B

Data generated

- 2013: 4.4 zettabytes
- 2020: 44 zettabytes
- 2025: 180 zettabytes

Source: IDC
Robot market to reach $226 billion by 2021 compared to $34 billion today

Industrial: $13 billion
Non-industrial: $21 billion

2016

Industrial: $20 billion
Non-industrial: $206 billion

2021

Digital assistants are driving the first wave of AI adoption

Percentage already using digital assistants:

42% of consumers

53% of millennials

72% of business decision makers

Source: PwC consumer intelligence series “How AI is pushing man and machine closer together”
Robotics and AI impacts

30% the increase in productivity in many industries in 10 years due to Robots and AI

18-33% the reduction in manufacturing labor costs over the same period

Majority of business executives see AI as business advantage of the future

67% agree AI will help humans and machines work together and combine both digital and human.

67% agree AI will augment decisions leading to new levels and types of roles.

62% agree AI will automatically augment decisions, leading to more effective decision-making.

67% agree AI will help businesses automate processes, resulting in increased efficiencies and labor productivity.

72% of business execs believe AI will be the business advantage of the future.

Source: PwC Digital IQ Survey 2016
Potential use of Robots/AI is endless

- Auto piloted cars
- Auto piloted ships
- Robot security guards
- Robot mailmen
- Robot healthcare workers
- Robot firemen
- Robots in army
In the next five years, in my personal life, I can see AI replacing humans as a...

- 58% Tutor
- 47% Home or family assistant
- 46% Health Coach
- 39% House Cleaner
- 30% Chauffer
- 22% Doctor

Source: PwC consumer intelligence series “How AI is pushing man and machine closer together”
In the next five years, I can see AI replacing humans in business as a...

- 56% Travel agent
- 54% Tax preparer
- 52% Office Assistant
- 41% Financial adviser

Source: PwC consumer intelligence series “How AI is pushing man and machine closer together”
Key regions/countries focused on AI
Revenues from the Artificial Intelligence (AI) market worldwide in 2015, by region (US$ Billions)

<table>
<thead>
<tr>
<th>Region</th>
<th>Revenues (US$ Billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>$49</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>$40</td>
</tr>
<tr>
<td>Europe</td>
<td>$33</td>
</tr>
<tr>
<td>Latin America</td>
<td>$4</td>
</tr>
<tr>
<td>Middle East and Africa</td>
<td>$0.24</td>
</tr>
</tbody>
</table>

Note: Worldwide; 2015
Source: Statista estimates; Transparency Market Research
Projected AI GDP impact by region

- **All regions** of the global economy will experience **benefits from AI**

- **North America** and **China** stand to see the **biggest economic gains** - **$10.7 trillion** representing **70%** of the global economic impact

- **Europe** and **developed Asia** will also experience **significant economic gains**

- **Developing countries** will see **modest increases in GDP** due to lower rates of adoption of AI technologies

Source: Sizing the prize: What’s the real value of AI for your business and how can you capitalize?, PwC June 2017

2016 GDP baseline based on Market Exchange Rate Basis; total impact as of 2030
China is the largest buyer of robots...

Source: https://qz.com/922742/china-is-rapidly-making-robots-that-will-one-day-manufacture-everything-you-buy/
...but still purchases 69% of its robots from overseas as well as relying heavily on foreign components

Power and productivity for a better world™
China is closing the robot tech gap with acquisitions

China's Midea receives U.S. green light for Kuka takeover

Zhejiang Wanfeng acquires US robotics maker Paslin

Updated: 2016-04-21 09:43
By Fan Feifei in Beijing and Shi Xiaofeng in Zhejiang (China Daily)
And soon China will be the largest producer

72,000 robots produced in 2016 with 100,000 to be produced by 2020

3000 industrial robot manufacturers have surfaced in China in past 5 years
Market valuations and AI
# Top 10 most highly valued companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Market cap $B</th>
<th>Revenue per employee $000</th>
<th>CAGR %e</th>
</tr>
</thead>
<tbody>
<tr>
<td>GE</td>
<td>$123</td>
<td>$314</td>
<td>$419</td>
</tr>
<tr>
<td>EXON Mobil</td>
<td>$101</td>
<td>$1,316</td>
<td>$3,110</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>$56</td>
<td>$229</td>
<td>$569</td>
</tr>
<tr>
<td>Microsoft</td>
<td>$52</td>
<td>$334</td>
<td>$752</td>
</tr>
<tr>
<td>BEA</td>
<td>$38</td>
<td>$199</td>
<td>$607</td>
</tr>
<tr>
<td>Berkshire Hathaway</td>
<td>$15</td>
<td>$363</td>
<td>$395</td>
</tr>
<tr>
<td>Shell</td>
<td>$145</td>
<td>$725</td>
<td>$2,625</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>$34</td>
<td>$366</td>
<td>$610</td>
</tr>
<tr>
<td>P&amp;G</td>
<td>$57</td>
<td>$338</td>
<td>$621</td>
</tr>
<tr>
<td>Disney</td>
<td>$34</td>
<td>$728</td>
<td>$1,872</td>
</tr>
</tbody>
</table>

Source: S&P Capital IQ
## Top 10 most highly valued companies 2016

<table>
<thead>
<tr>
<th>Company</th>
<th>Market cap $B</th>
<th>Revenue per employee $000 1995*</th>
<th>Revenue per employee $000 2016</th>
<th>CAGR %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft</td>
<td>$489</td>
<td>$334</td>
<td>$752</td>
<td>3.9%</td>
</tr>
<tr>
<td>Berkshire Hathaway</td>
<td>$407</td>
<td>$199</td>
<td>$607</td>
<td>5.5%</td>
</tr>
<tr>
<td>Exxon Mobil</td>
<td>$376</td>
<td>$1,316</td>
<td>$3,110</td>
<td>4.2%</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>$315</td>
<td>$229</td>
<td>$569</td>
<td>4.4%</td>
</tr>
<tr>
<td>$312</td>
<td>$363</td>
<td>$395</td>
<td></td>
<td>0.4%</td>
</tr>
<tr>
<td>$280</td>
<td>$314</td>
<td>$419</td>
<td></td>
<td>1.4%</td>
</tr>
<tr>
<td>$602</td>
<td>$839</td>
<td>$1,883</td>
<td></td>
<td>3.9%</td>
</tr>
<tr>
<td>$532</td>
<td>$1,056</td>
<td>$1,253</td>
<td></td>
<td>1.4%</td>
</tr>
<tr>
<td>$367</td>
<td>$244</td>
<td>$398</td>
<td></td>
<td>2.6%</td>
</tr>
<tr>
<td>$339</td>
<td>$1,159</td>
<td>$2,178</td>
<td></td>
<td>13.5%</td>
</tr>
</tbody>
</table>

* Except for Alphabet (2004), Amazon (1997), and Facebook (2011)

Source: S&P Capital IQ
# Top 10 most highly valued companies

<table>
<thead>
<tr>
<th>Company</th>
<th>Market cap $B</th>
<th>1995 Net income per employee $000</th>
<th>2016 Net income per employee $000</th>
<th>CAGR %e</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Electric</td>
<td>$123</td>
<td>$30</td>
<td>$30</td>
<td>0%</td>
</tr>
<tr>
<td>Exxon Mobil</td>
<td>$101</td>
<td>$79</td>
<td>$108</td>
<td>1.5%</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>$56</td>
<td>$29</td>
<td>$131</td>
<td>7.4%</td>
</tr>
<tr>
<td>Microsoft</td>
<td>$52</td>
<td>$82</td>
<td>$147</td>
<td>2.8%</td>
</tr>
<tr>
<td>Berkshire Haileway</td>
<td>$38</td>
<td>$36</td>
<td>$65</td>
<td>2.9%</td>
</tr>
<tr>
<td>Google</td>
<td>$15</td>
<td>$76</td>
<td>$102</td>
<td>1.4%</td>
</tr>
<tr>
<td>Shell</td>
<td>$145</td>
<td>$46</td>
<td>$51</td>
<td>0.5%</td>
</tr>
<tr>
<td>AT&amp;T</td>
<td>$34</td>
<td>($52)</td>
<td>$48</td>
<td>-</td>
</tr>
<tr>
<td>P&amp;G</td>
<td>$57</td>
<td>$27</td>
<td>$100</td>
<td>6.4%</td>
</tr>
<tr>
<td>Disney</td>
<td>$34</td>
<td>$22</td>
<td>($9)</td>
<td>-</td>
</tr>
</tbody>
</table>

Source: S&P Capital IQ
## Top 10 most highly valued companies 2016

<table>
<thead>
<tr>
<th>Company</th>
<th>Market cap $B</th>
<th>Net income per employee $000 1995*</th>
<th>2016</th>
<th>CAGR %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft</td>
<td>$489</td>
<td>$82</td>
<td>$147</td>
<td>2.8%</td>
</tr>
<tr>
<td>Berkshire Hathaway</td>
<td>$407</td>
<td>$36</td>
<td>$65</td>
<td>2.9%</td>
</tr>
<tr>
<td>Exxon Mobil</td>
<td>$376</td>
<td>$79</td>
<td>$108</td>
<td>1.5%</td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td>$315</td>
<td>$29</td>
<td>$131</td>
<td>7.4%</td>
</tr>
<tr>
<td>General Electric</td>
<td>$312</td>
<td>$76</td>
<td>$102</td>
<td>1.4%</td>
</tr>
<tr>
<td>$280</td>
<td>$30</td>
<td>$30</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td>Apple</td>
<td>$602</td>
<td>$32</td>
<td>$390</td>
<td>12.6%</td>
</tr>
<tr>
<td>Amazon</td>
<td>$532</td>
<td>$132</td>
<td>$270</td>
<td>6.1%</td>
</tr>
<tr>
<td>Amazon</td>
<td>$367</td>
<td>$(46)</td>
<td>$7</td>
<td>-</td>
</tr>
<tr>
<td>Facebook</td>
<td>$339</td>
<td>$313</td>
<td>$823</td>
<td>21.3%</td>
</tr>
</tbody>
</table>

* Except for Alphabet (2004), Amazon (1997), and Facebook (2011)

Source: S&P Capital IQ
market cap (billions) and active users (millions)

Source:
- Strategist’s guide to AI, Strategy&

Twitter users (millions)

US$ billions

- $350
- $300
- $250
- $200
- $150
- $100
- $50
- $10
- $-50

- 2010
- 2013
- 2015
- Q1 2017

Market cap
Twitter users
Source: Strategist’s guide to AI, Strategy&
http://www.businessinsider.com/wechat-breaks-700-million-monthly-active-users-2016-4
Why is Tencent 腾讯 winning?

- Sophisticated voice recognition
- Chinese to English language translation
- Virtual bot friends
- Facial recognition
- Virtual guessing game opponents
AI deals
Acquisitions of AI companies are accelerating – over 30 in Q1 2017 and 200 since 2012

$1 billion investment over 5 years. Argo AI tasked to develop virtual driver system

Monsanto Buys Climate Corp For $930 Million

GE Buys Bit Stew for $153M to Beef Up Its Industrial Internet Software

GE acquires Wise.io to deepen its machine learning stack
AI startup acquirers: Google #1, Apple#2, Facebook, Intel and Microsoft #3

2016 AI venture investment by geography

- United States: 61.7%
- United Kingdom: 6.5%
- Israel: 4.3%
- India: 3.5%
- France: 3.3%
- Germany: 2.9%
- Canada: 2.7%
- Other: 15.0%

Source: CBInsights
Non-tech companies have become major tech acquirers

682 the number of tech companies bought by non-tech acquirers

2016 the first year the number of tech companies bought by non-tech surpassed those acquired by tech

15% the number of tech deals in 2016 – more than any other sector

$80B the 2016 deal value of US tech deals by non-digital buyers, second year in a row

Sources: Bloomberg, Thomson Reuters, PwC Deal Insights Year End 2016
AI across industries
Telecommunications
Telecoms are looking for new markets...

Verizon acquires Skyward, aims to manage drone operations, connections

AT&T to launch network for Internet of Things
New cellular technology able to reach farther, use less power

Pepsico exec explains how smart soda machine uses AT&T LTE-M network
...with AI dependent on data and connectivity, telecoms are at the core of AI development
A number of telecoms have introduced virtual assistants, a key enabler for the success of smart home applications.

Deutsche Telekom

Telefónica presents AURA, a pioneering way in the industry to interact with customers based on cognitive intelligence.

SK Telecom launches AI-based voice assistant service

The first to understand the Korean language, SK Telecom's NUGU virtual assistant service is armed with advanced voice recognition, natural language processing, and deep learning technology to help your way around the home.

Orange unchained with Djingo smart home launch
Telecoms are also using AI to leverage infrastructure assets and offer cloud computing and network services.
On the cost side, telecoms are also realizing cost-optimization benefits from AI

Network Planning
Self-optimizing Networks
Network Maintenance

Vodafone’s Customer Service Chatbot TOBi
Sales-agent Support
Customer Analytics
AI across industries
Financials
Opportunity abounds for AI in financial services


- Insurance: 54% Use of machine algorithms, 46% Human judgment
- Banking and capital markets: 34% Use of machine algorithms, 66% Human judgment
- Asset and wealth management: 26% Use of machine algorithms, 74% Human judgment
Use of artificial intelligence technology in financial services to grow

Firms are increasing productivity and personalizing the client experience with AI

Financial advisers must adapt quickly to competition from robos to stay in business: CFP Board

The CFP Board's research is the result of a gathering of more than two dozen fintech and other industry experts, who pondered how the advice business will change by 2021

Tools financial technology companies plan to bring advisers in 2017

Many of the tools will be inspired by today's customer, who wants the same efficiency and ease they find with Amazon
Why financial services is using AI solutions

AI across industries
AutoTech
AI is powering Auto Tech

Hello, OnStar -- Meet Watson

-- IBM and GM introduce new cognitive mobility platform to improve the driving experience for millions of consumers
-- Watson to connect consumers with such brands as ExxonMobil, Glympse, iHeartRadio, Mastercard and Parkopedia

Toyota Research Institute puts $35M into AI-powered materials research

Posted Mar 30, 2017 by Darrell Etherington (@etherington)

By 2020, consultancy Gartner estimates that nearly 250 million cars will be connected to the Internet, and PriceWaterhouseCooper forecasts that the connected car market will be worth $149 billion by that year.

GM buys self-driving car kit startup Cruise, plans to use tech to make driverless cars
And it’s turning carmakers into technology companies

Over-the-air (OTA) software updates

Connected vehicles send performance data directly to dealer

IoT systems will diagnose issues, some of which can be corrected remotely

Vehicle-to-vehicle technology will allow cars to communicate with each other, reducing accidents

New features can be delivered OTA – providing new revenue streams
33 Corporations working on autonomous vehicles
Autonomous car leaders

Tesla is loaded with German components: Chipmaker Infineon, sensors from Bosch

Apple Car
Apple's vehicle project, focused on building an autonomous driving system.

TechCrunch Disrupt: Ford open to talks with Waymo

Waymo
2.5 million miles self-driven

We've accumulated the equivalent of over 400 years of human driving experience, largely on complex city streets. That's on top of 1 billion simulated miles we drove just in 2016.
New joint ventures and alliances

Ford-Google alliance leading coalition of companies advocating federal approval of driverless cars
AI across industries
Healthcare
AI and Healthcare – top 3 applications

1. Personal genetics: Google’s “Deep Mind” and IBM’s “Watson”

2. Hyper targeted drugs

3. Discovering and managing new diseases
“At the University of North Carolina School of Medicine, Watson (IBM’s AI product) was tested on 1,000 cancer diagnoses made by human experts. In 99% of them, Watson recommended the same treatment as the oncologists. In 30% cases Watson found treatments which humans missed.”
Amazing new capabilities today

First-ever autonomously controlled 'capsule robot' explores colon

Researchers cite future role in improving acceptance, accuracy of colonoscopy

Date: May 8, 2017

Click-on arm prosthesis controlled by patient's thoughts

Date: April 25, 2017
Source: Radboud University Nijmegen Medical Centre, Netherlands
Emerging AI-enabled capabilities

AI can predict autism through babies’ brain scans

University of North Carolina researchers developed deep learning algorithm – 81% accuracy

AI is nearly as good as humans at identifying skin cancer

The deep learning algorithm could eventually give you a diagnosis at home.

And like AutoTech, there are both health and tech players working on solutions

Alphabet starts collecting health info to better predict disease

Verily's study will use its health-tracking watch to spot early signs of illness.
Will AI and Robots really mean fewer jobs?
AI’s impact on jobs and skills

By 2030 AI will automate...

65% of jobs in consumer staples

70% of jobs in energy sector

And AI will deliver...

An EBITDA uplift of $33 billion in energy

And $29 billion in consumer staples

AI introduces new workflows to legal profession

“Cheap, accurate artificial intelligence closes in on the work of junior lawyers”
– FT May 5, 2017

80% of consumers says it’s more important to have access to more affordable legal advice than to preserve the jobs of lawyers.

In 2016, 67 US “lawtech” startup investments totaling $155 million
AI improves customer service

92% percent of senior executives believe that customer experience is a key competitive differentiator

“AI is powering nearly every experience we have—making it smarter, seamless and personalized—and as a result our expectations as consumers are at an all-time high.”

64% of consumers says it’s more important to have instant access to quality customer service than to preserve the jobs of customer service reps.

Sources: Huffington Post, 3/7/2017 (http://www.huffingtonpost.com/entry/ai-powered-customer-service-needs-the-human-touch_us_58b88046e4b0fffd61787bd3d), Salesforce Research
But there’s an opposing view – why AI is not a job killer

Computerization has led to new, well-paying careers in areas that didn’t exist before

ATMs resulted in a 10% increase in bank tellers between 1980 and 2010 as banks refocused on loans, investments and other relationship-based services

When IT is not automated, IT staff are consumed by fixing network issues. With these tasks automated, IT can spend time on innovative business solutions

Automation drives employment

- Automation reduces production costs
- Reduced product costs reduce product prices
- Reduced product prices increases demand for products
- Increased demand for products drives increased employment

Robots aren’t destroying enough jobs – the fastest growing sectors are the least productive

Value added per employee, 2016

Total growth in employees, 2007 to 2017**

** Through the first four months of 2017
Source: WSJ, May 10 2017
“Computers are really good at an increasingly sophisticated range of things, but they're still quite bad at being people.”

Lisa Kahn, Labor Economist at Yale University
AI implications
Key elements of AI worth considering

- Unknown Regulations
- Globally Diverse Players
- Competing Standards/Technologies
- No Clear Leaders
- Multiple Sets of Diverse Regulations
- A Broad Range of Products and Platforms
Likely impact of AI

- New Opportunity to Redefine the Risk Reward Equation
- Greater Real-time Reliance on Cognitive Computing
- Opportunities for New Product/Service Offerings
- Growing Power of Secured Connections
- Renewed Focus on Quality with Zero Tolerance for Errors
- Higher Complexity
**Likely impact of AI (cont.)**

- **Change in Leading Players??**
- **Reshuffle in Geographical Dominations?**
- **AI-empowered Companies and Products become Clear Differentiators**
- **Continuing Consolidations**
- **New Partnerships and Alliances**
- **Increasing Cross Border Partnerships, Mergers and Alliances**
- **A Relook at Vertical Integration?**
Likely impact of AI (cont.)

TAM Expansion beyond Traditional Markets

New Opportunities for Margin Expansion

Newer Disruptions not Experienced before

Maturing of BRIC Players

Business Opportunities beyond Traditional Opportunities

Interest in TMT Sector by Industrial & Other Sectors
Keys to success in a disruptive world

- Agility
- Lowest Cost Base
- Scale
- Diverse Workforce
- Digital Security with Transparency
- Global Mindset and Global Presence
- Commitment to Partnering with Others
- Managed Risk Taking
AI Implications

• **Pragmatic companies are engaging the C-suite and Boards of Directors** in strategic discussions and analysis of upcoming AI-led disruptions to the market place and their business

• **Companies need to pursue this as a “Strategic Opportunity”**

• **If companies do not pursue this as a “Strategic Opportunity” today, they will have to tackle this as a “Major Challenge” in the not too distant future**

• **“Missed opportunities” of today will become the “Chronic Headaches” of tomorrow**
AI Implications

• You know your business and your company the best.
• Indulge your management teams in a brainstorming session of both
  • How you are going to be disrupted by AI and
  • what opportunities you have to disrupt others
• This should be both an offensive and a defensive strategy discussion
• The right time is now
• Start the dialogue starting today
“We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten. Don’t let yourself be lulled into inaction.”

Bill Gates, Founder, Chairman Microsoft
Thank you

Raman Chitkara
raman.chitkara@pwc.com
www.linkedin.com/in/raman-chitkara-63a1017b/
@RamanChitakra