

**Artificial Intelligence and Data
Automation – Game Changer on
Data Analysis and Decision-
Making**

**Opening Comments: Getting Ready for Data Automation*
Patti Compton May 17, 2018**

*AI slide courtesy of John Gregory, PFE

What does revolutionize mean?



An example of a revolution: “Retail”



Revolution can Challenge even Legendary Players



The New York Times

Ford, Trudging Into the Future, Ousts Mark Fields as C.E.O.

**Ford's New CEO Has Ambitions Beyond
Self-Driving Cars** ~*Observer*

**Ford Doubles Down on Its Investment
in Electrified Future** ~*MediaPost*

**Ford plans \$11B investment,
40 electrified vehicles by 2020** ~*Reuters*

Ford CEO As Car Industry Critic ~*Fortune*

Together, let's take back the streets ~*CNBC*

Revolution vs. Optimization

amazon

The Amazon logo consists of the word "amazon" in a bold, black, sans-serif font. Below the word is a curved orange arrow that starts under the 'a' and points towards the 'n'.

A New Era of Artificial Intelligence (AI)

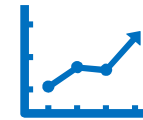
Growth in AI
Fueled by:



Faster Processing
Speed



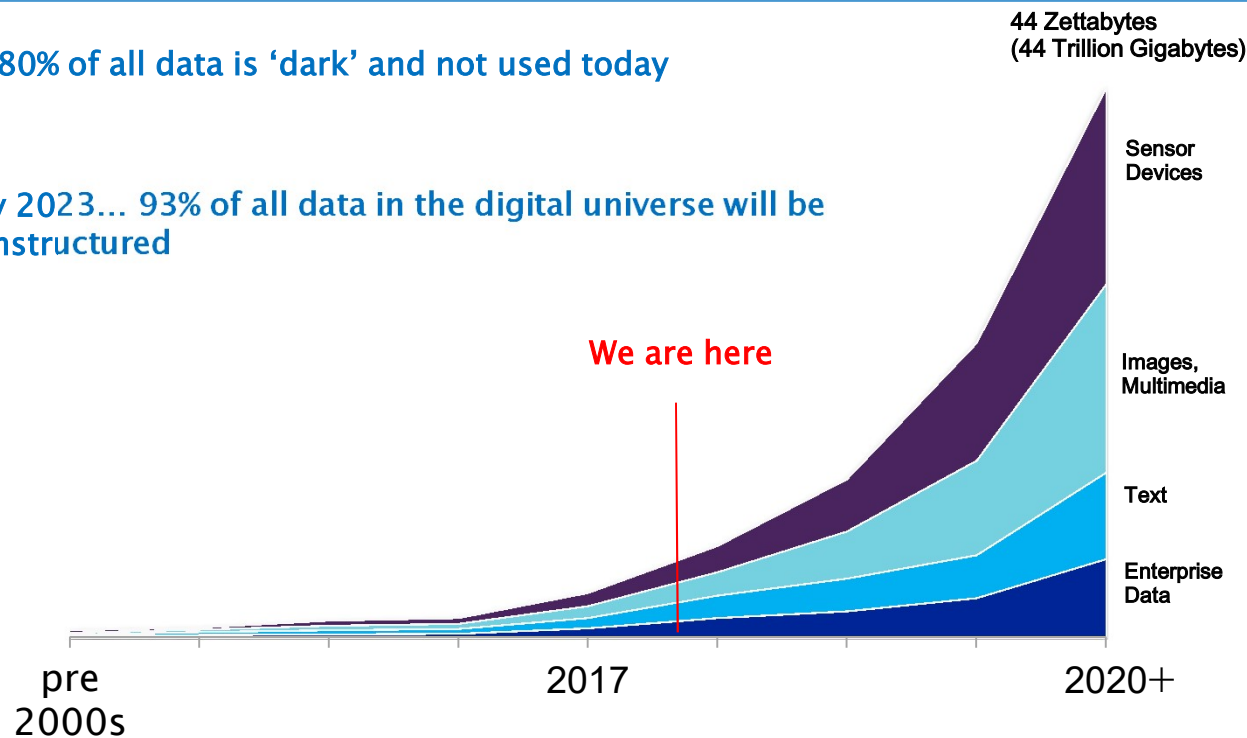
Smarter
Algorithms



Exponential Growth
of Data

>80% of all data is 'dark' and not used today

By 2023... 93% of all data in the digital universe will be unstructured



Sources: IBM
IDG

\$31 billion Investment

in AI expected in 2019

>2300 startups

Founded to date

Market revenue for AI
expected to exceed

\$60 billion by 2025

So, what is Artificial Intelligence?

...a combination of capabilities that allow a machine to replicate human decision-making & interactions. Select AI components:

Speech Recognition:

Automated recognition of speech and translation to text

Machine Learning:

Algorithms that learn from and make inferences or predictions upon data; models improve as more information is available

Machine Vision:

High-level image processing designed to decipher the physical contents of an image(s)



Natural Language Processing (NLP):

Machine based processing that allows for human-like interpretation of text

Audio Signal Processing:

Capability to identify & decipher characteristics related to sound

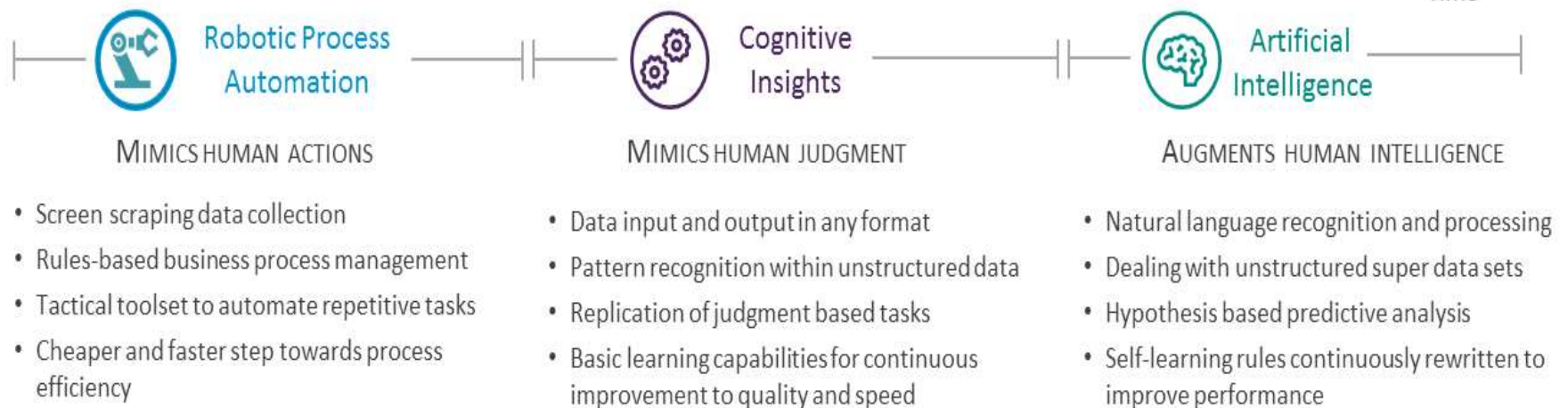
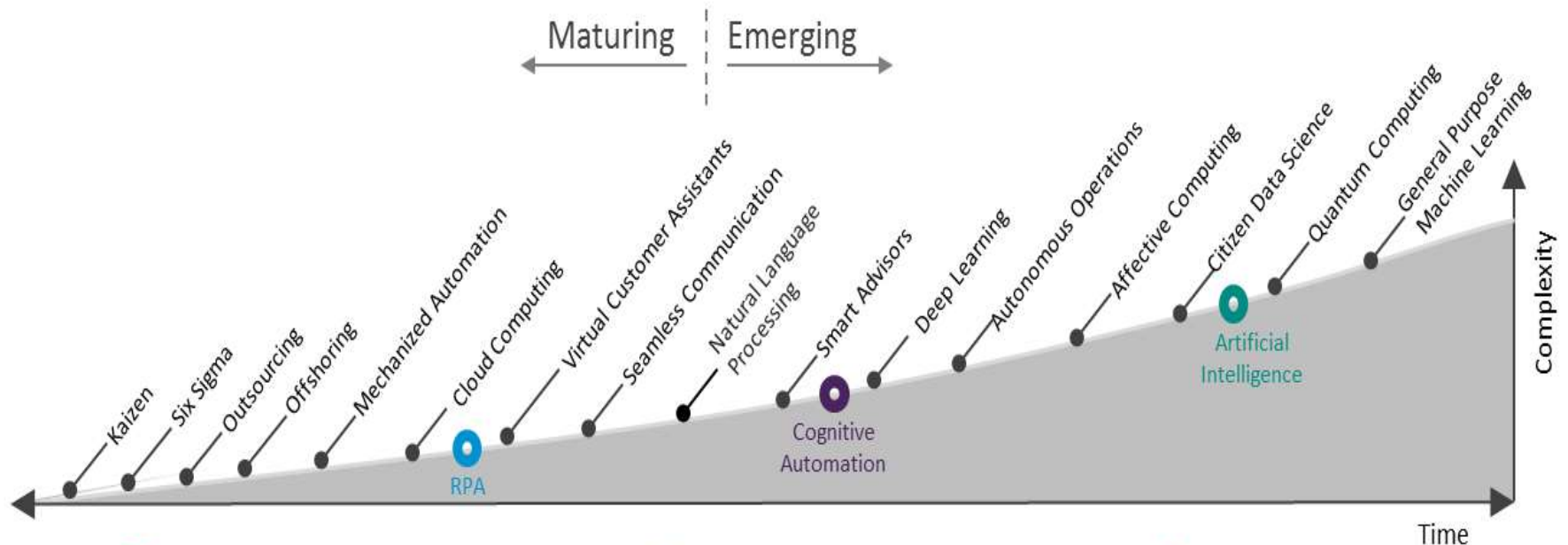
Robotic Process Automation (RPA):

Replicates the actions of a human being interacting with the user interface of a computer system

...self-learning systems to mimic the way the human brain works

How do these fit in an Evolution of Capabilities?

Process capabilities and technologies continue to evolve toward robotics and cognitive automation



Two main archetypes of AI use cases in biopharma R&D

Archetype	Description	Illustrative biopharma R&D examples
Automation	AI enables automation of complex processes that could not be automated previously and thereby generates cost/speed/quality gains.	Safety case processing, clinical supply chain optimization, manual cell sorting (FACS) analysis, high-content screening analysis
Insight generation	AI enables generation of unique R&D insights from complex data that would not have readily been generated otherwise, which lead to identification of new projects and/or improved development plans for existing ones.	Biomarker / target identification from omics data in clinical trials, rational selection of drug combinations from electronic health records, virtual compound screening

Sample Data AI Roadmap

Today

2020+

People



- Data Services utilizes significant #'s data managers and statistical programmers world wide
- Many of their tasks are manual repetitive activities (i.e., database build, data extraction, reporting, and publishing)

- Robotic Process Automation (RPA) virtual users called BOTs will replace the need for human involvement for many of these steps
- Cognitive machine learning and ultimately AI capabilities will evolve and improve the quality and timeliness of our deliverables

Processes



- Dependent on manual human involvement
- Humans are not infallible – we are prone to interpretation issues and mistakes
- Knowledge and capabilities vary from person to person
- Some processes have not changed in 20 years

- Machines are only as good as the instructions provided to them by humans
- The benefit is that learnings are universally applied and adaptation will continuously improve performance
- Time to take advantage of new technologies

Technology



- Systems are highly transactional
- Infrastructures are a burden to maintain and expensive
- Operationally dependent on highly trained users and a legion of supporting staff

- Robotics and AI are the technologies of today and tomorrow
- Infrastructure services can organically grow and adapt to our enterprise
- Continue to explore what the future has in store

Revolution and Optimization

- ▶ Educate your group
- ▶ Review your processes
 - Characterize your processes
 - Value (Quality Improvement/Cycle time acceleration/Cost Savings/Difficulty of Implementation)
- ▶ Small pilots
- ▶ Evolve your roadmap

