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SYMPOSIUM | ITXPO®
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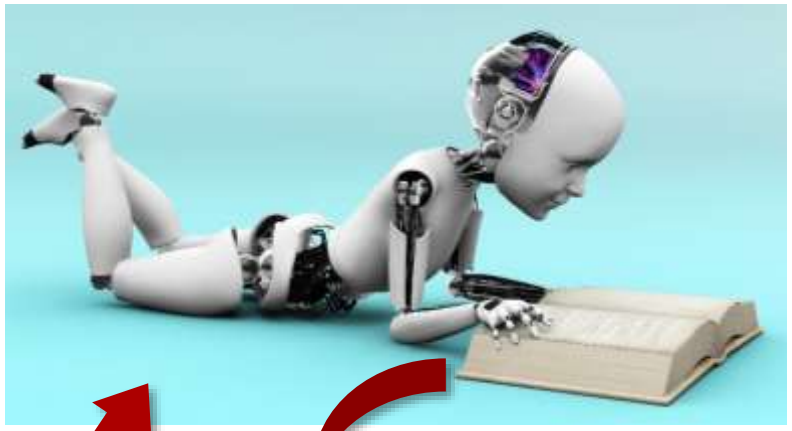
To the Point: The Intersection of AI Innovation and Life Sciences Expectations: How to Be Smart About AI

Michael Shanler

The Promise of AI-Driven Research



Good morning *Dr. Smith.* It's time to evaluate the latest **biomarker research.** Can I do that for you?

Personalized R&D Plan

Cure!

Algorithms Cognitive Computing Machine Learning Deep Neural Nets Prescriptive Analytics
Robotic Process Automation Conversational User Interface Pattern Recognition Natural Language Processing

Now, Imagine That AI Is Easy

Would your organization be ready for AI, even if it were really easy?

If Everyone Is Doing It, It Must Be Easy

Pharmaceutical, Biotechnology, Medical Device, CROs, etc.

NOVARTIS
Celgene
Pfizer
ucb
QuintilesIMS
ICON
A Symbol of Excellence
novo nordisk
Johnson & Johnson
GNS HEALTHCARE
Medtronic
MERCK
INVENTING FC
Inspiring the Art of Surgery
Mazor Robotics

Science-Based CROs w/AI Technology

BenevolentAI
twoXAR
INSILICO MEDICINE
BERG
SYNTHACE

LS Vendors w/AI Capabilities

ArisGlobal
AiCure
medidata

AI Technology Vendors and Consultants

accenture
Cognizant
Deloitte.
HCL
Capgemini
pwc
NNIT
Tessella
epam
GENPACT
Microsoft
IPSOFT
SINEQUA
REAL-TIME BIG DATA SEARCH & ANALYTICS
AKTANA
IBM WATSON

How to Be Smart About AI

1. What's the buzz around AI in life science?
2. Which emerging AI capabilities have the most potential?
3. How CIOs can prepare to exploit AI opportunities?

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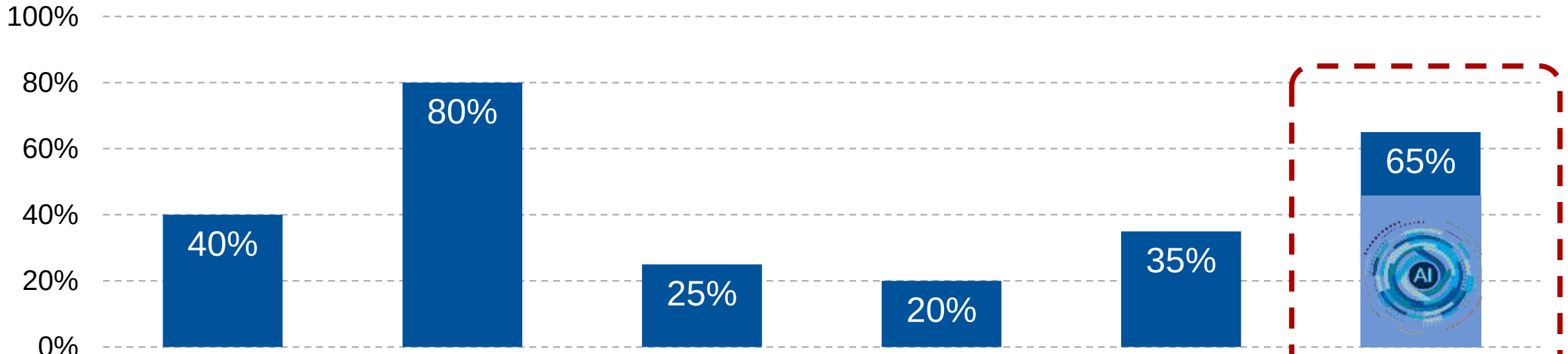
Digital Care Delivery — Strategic Planning Assumptions



By 2020

40% of HDOs will find their EHRs are Not fully capable of meeting their care delivery needs.

By 2020

80% of U.S. midsize delivery organizations will have procured a population health management platform.

By 2021

25% of HDOs with $1 billion in net revenue will be providing real-time, genomics-based, clinical decision support at the time of prescription writing.

By 2022

20% of the population with chronic conditions will rely on virtual health assistants for health and wellness management.

By 2025

35% of all care in the U.S. will be delivered virtually.

By 2027

The majority of interactions will be virtual or remote and the majority of those will involve AI applications

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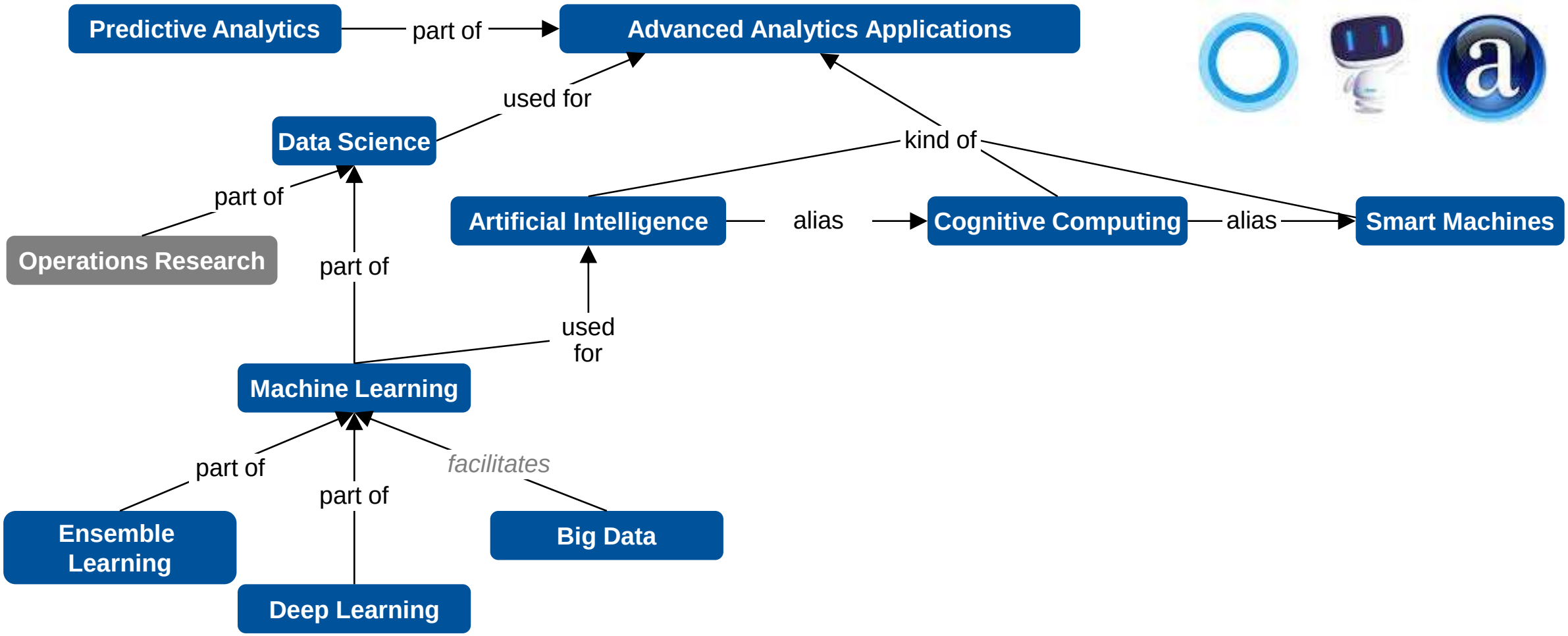
AI
Science
Technology
Instruments
Information
Digital Care
Tests
Processes
Outcomes
Revolutionizing R&D, health, and the delivery of care

AI-Assisted Lab and Business Processes



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But, It's Complex

Many areas of study, capabilities and technologies

Adaptive Intelligence

Augmented Intelligence

Machine Learning

Predictive Analytics

Bots

Cognitive Computing

Deep Neural Nets

Chatbots

Prescriptive Analytics

Deep Learning

Augmented Reality

X

Many use cases and applications

Diagnostic Imaging Interpretation

Drug Discovery

Clinical Trials

Consumer Engagement

Precision Medicine

Coding and Documentation

Disease Management

Fraud Detection

Insurance Preauthorizations

X

Many unknowns, unchartered territory

What Happens If the Algorithm Gets It Wrong?

How Do the Algorithms Get Verified?

How Are AI "Decisions" Recorded?

Will Clinicians Trust the AI?

How Does AI Learn and Is the Same Decision Made Over and Over Again?

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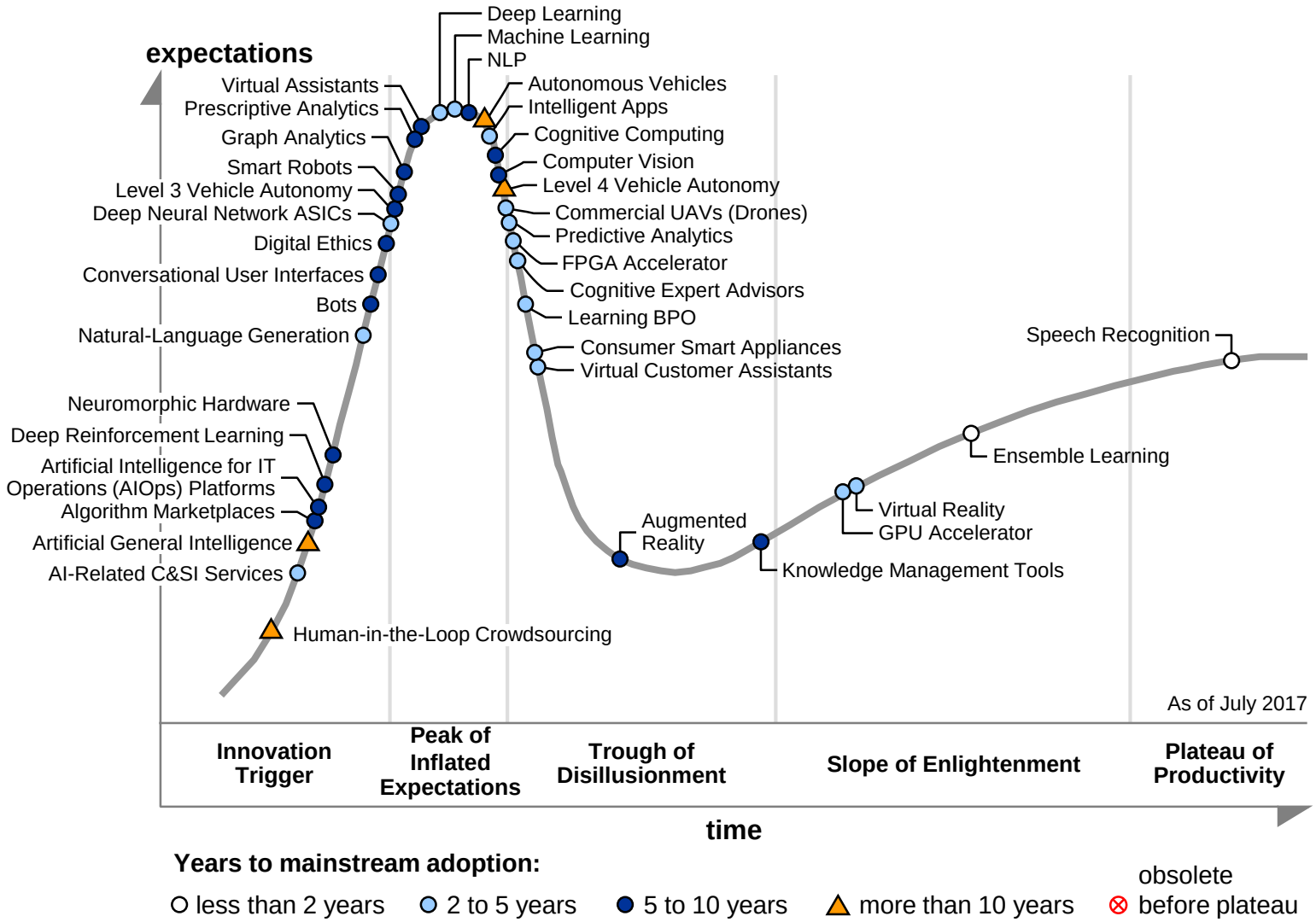
Gartner's Hype Cycle for Artificial Intelligence 2017 Illustrates This

- 38 individual technology profiles
- 41% are rated as transformational, with another 44% rated as offering high benefits
- 87% are positioned before or in the Trough of Disillusionment
- 54% are not expected to reach maturity and deliver reliable productivity for the mainstream buyer until 2022 or later



From "Hype Cycle for Artificial Intelligence, 2017" 24 July 2017 (G00314732)

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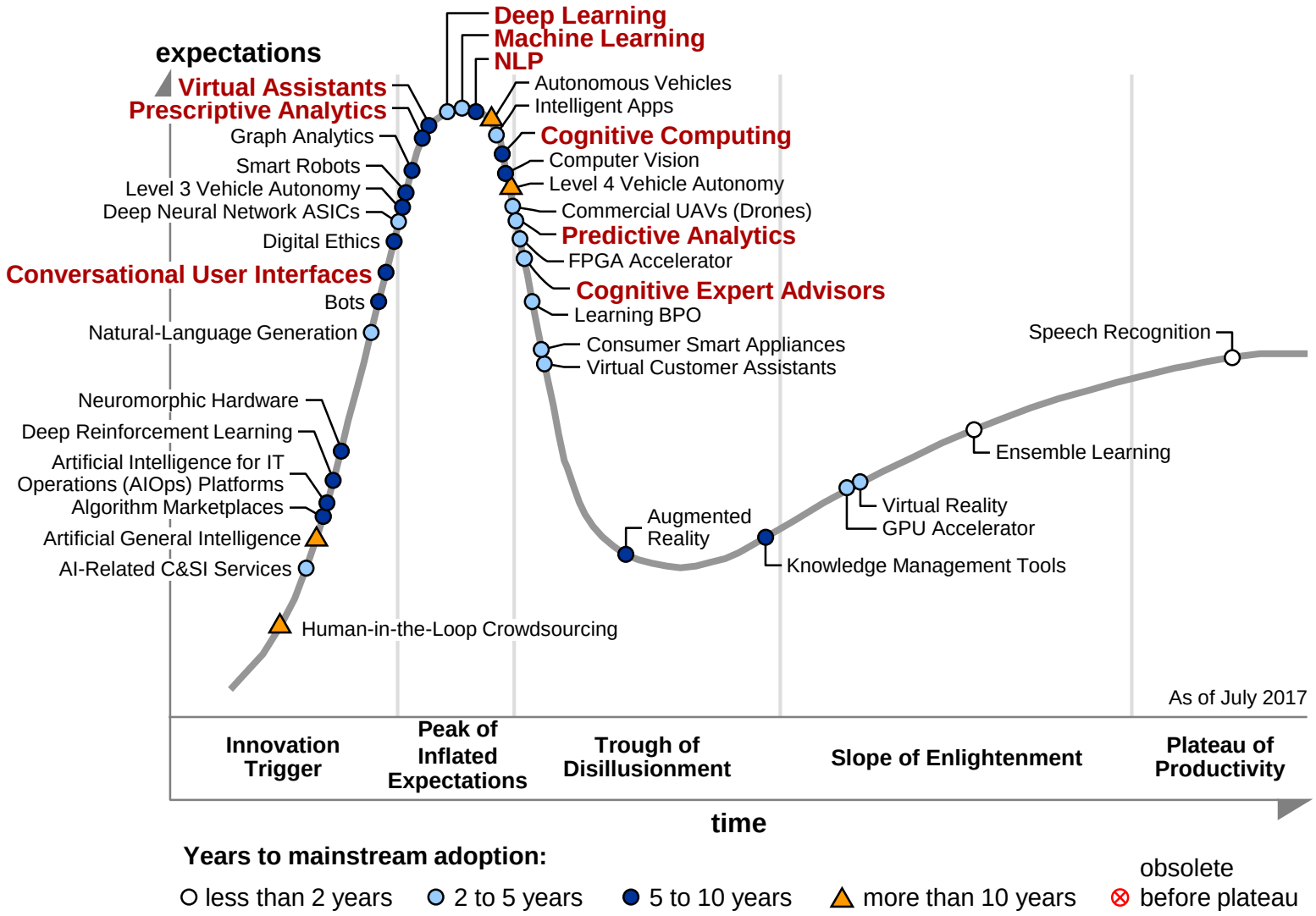
Some Are Showing More Promise in Healthcare Than Others

- Predictive and Prescriptive Analytics
- Natural Language Processing
- Machine Learning
- Deep Neural Nets and Deep Learning
- Cognitive Computing and Cognitive Expert Advisors
- Bots
- Virtual Assistants
- Conversational User Interface



From "Hype Cycle for Artificial Intelligence, 2017" 24 July 2017 (G00314732)

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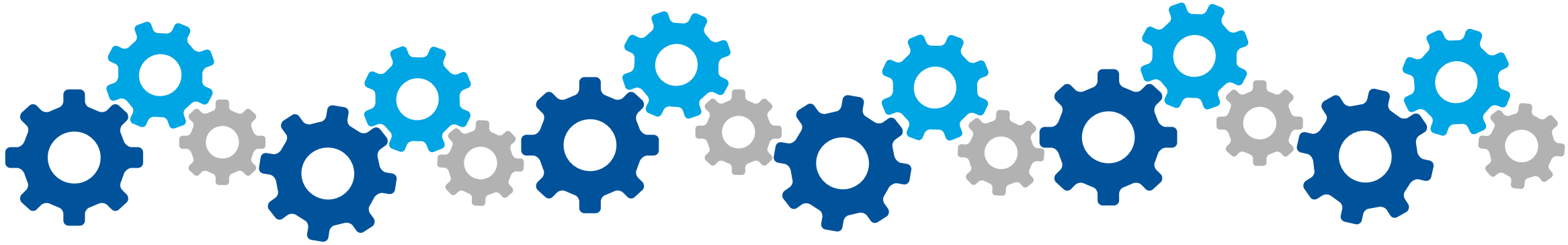
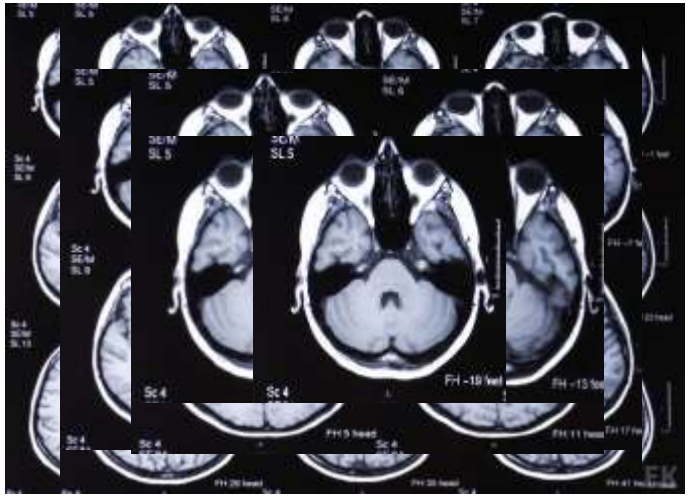
Making Healthcare More Efficient





AI Enable Diagnostic Imaging Interpretation

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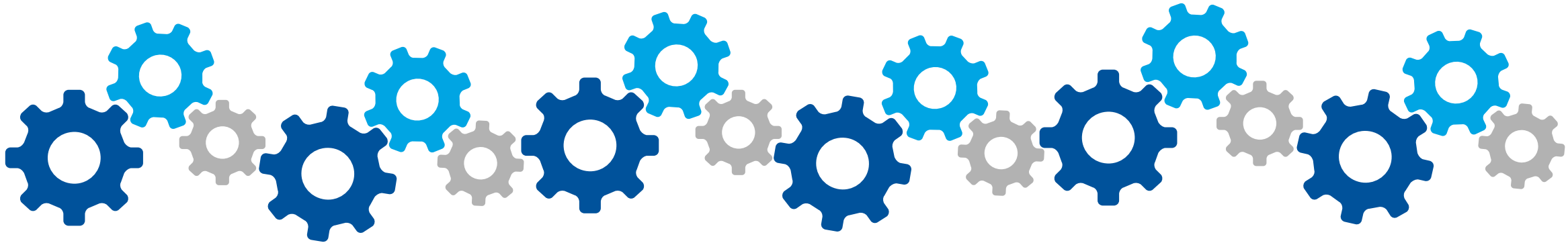
Making Healthcare More Efficient



Improving Customer Service

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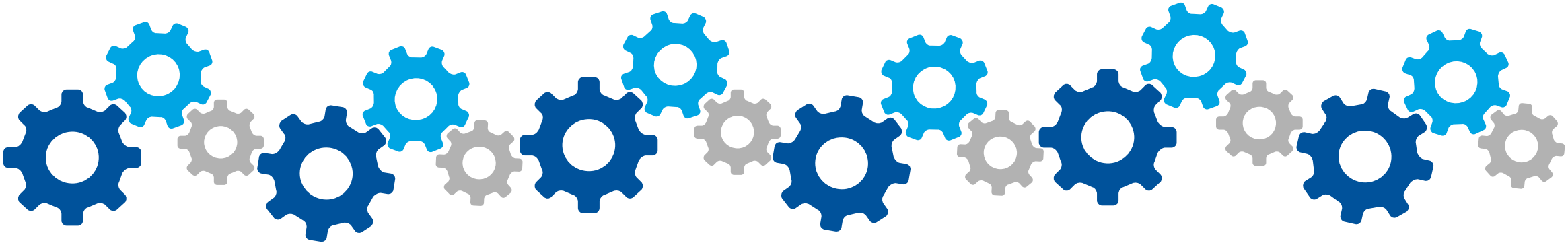
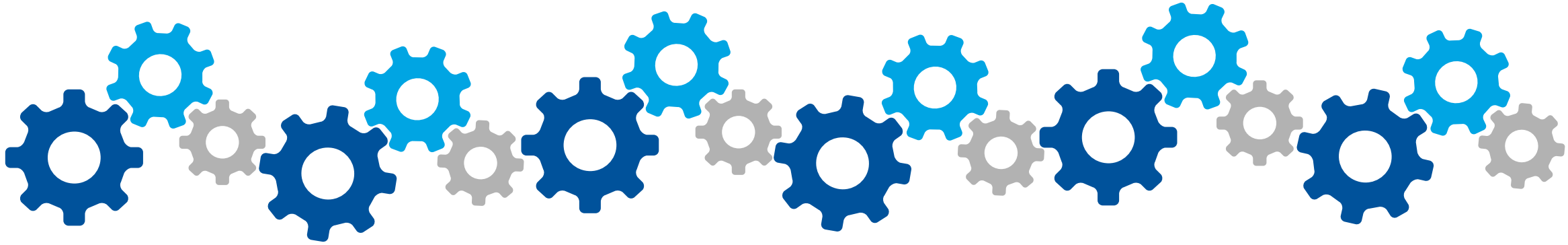
Making Healthcare More Efficient



Assisting Coding and Documentation

Making Healthcare More Efficient



Simplifying and eliminating repetitive tasks

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Advancing Research and Discovery

Drug Discovery

Translational Research

Clinical Trials

Outcomes

Tests

Digital Care

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Transforming Medicine

- Tailored Treatments
- Individual Therapies
- Genetic Matching
- Precision Health

Personalized Medicine

Natural Language Processing | Prescriptive Analytics | Machine Learning | Deep Neural Nets

Transforming Commercial

- Digital Commercial Assistant — Drives Improved Engagement Between Reps and Doctors.

AKTANA

Natural Language Processing | Prescriptive Analytics | Machine Learning | Deep Neural Nets

Intelligent Text Mining and NLP for Pharmacovigilance

- Pharmacovigilance Artificial Intelligence (PVAI):
  - Increased adverse events volume trend across industry makes manual case processing inefficient.
  - Hypothesis generation using wide array of data sources.
  - "Touchless AE Processing" automatically generates notifications and follow ups without human intervention.
  - As practitioners make corrections to case data, PVAI learns and improves accuracy.
    - Optical Character Recognition (OCR) + Robotic Process Automation (RPA) + Natural Language Processing (NLP) + Machine Learning (ML)

GENPACT

Natural Language Processing | Prescriptive Analytics | Machine Learning | Deep Neural Nets

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Transforming Commercial

- Miniaturized electronics
- Analytics
- Consumer software development
- Diabetes management

SANOFI

verily

onduo

Onward together

September 12 2016

Sanofi and Verily Life Sciences Announce Launch of Ondua, a Joint Venture to Develop Comprehensive Diabetes Management Platform

Natural Language Processing | Prescriptive Analytics | Machine Learning | Deep Neural Nets

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Training and Powering Robotics

- Robotic Limbs
- Robotic Assisted Surgery
- Physical Assistance
- Psychological Care




Deep Neural Nets Deep Learning Machine Learning

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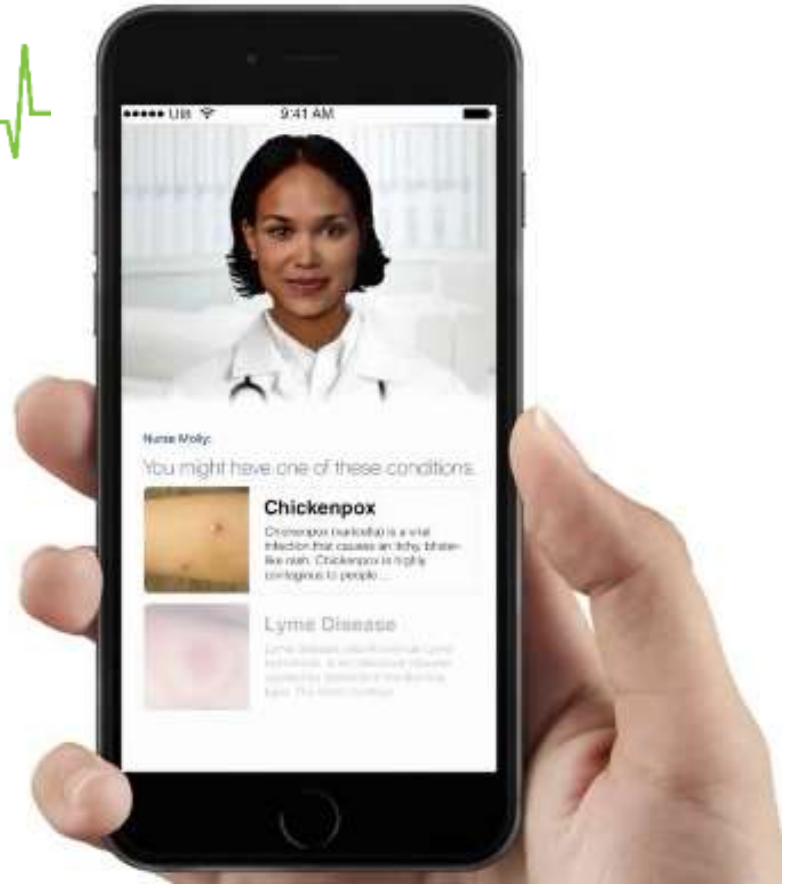
Engaging Patients With Virtual Assistants

- Medication Reminders
- Chronic Condition Management
- Health and Wellness Management
- Appointment Scheduling
- Symptom Collection

SENSELY
how are you feeling today?



Cognitive Computing | Cognitive Expert Advisors | Bots and Chatbots

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AI Requires Planning, CIOs Need to Think Ahead

"If I were a CIO, I'd be thinking: I better start building the capabilities in my existing IT stack so that when deep learning is validated and becomes real, I'm ready to use it and exploit it"

– Paul Chang, MD,
Professor and Vice Chair of Radiology
at University of Chicago Medical Center

What is Different with AI?

1 AI introduces potential radical change to process and behavior. Requires profound cultural sensitivity.

- Create awareness across all levels of the organization. Establish energy around AI.
- Find a champion. Create a charter, guidelines and processes towards an effective AI journey
- Develop an effective framework for evaluating AI opportunities.

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What is Different with AI?

1. AI introduces potential radical change to process and behavior. Requires profound cultural sensitivity.

2. AI requires new methods to verify the science and mitigate the risks

- Create an AI Center of Excellence
- Involve legal in the discussion
- Understand the regulatory environment
- Work with vendors

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What is Different with AI?

1. AI introduces potential radical change to process and behavior. Requires profound cultural sensitivity.
2. AI requires new methods to verify the science and mitigate the risks
3. AI needs new skills and technologies

- Consider building your data science laboratory. Have a team of data scientists skilled in using advanced techniques like R, python, Hadoop, Spark and Scala.
- Invest in process engineer(s)/ process experts to be part of the team.

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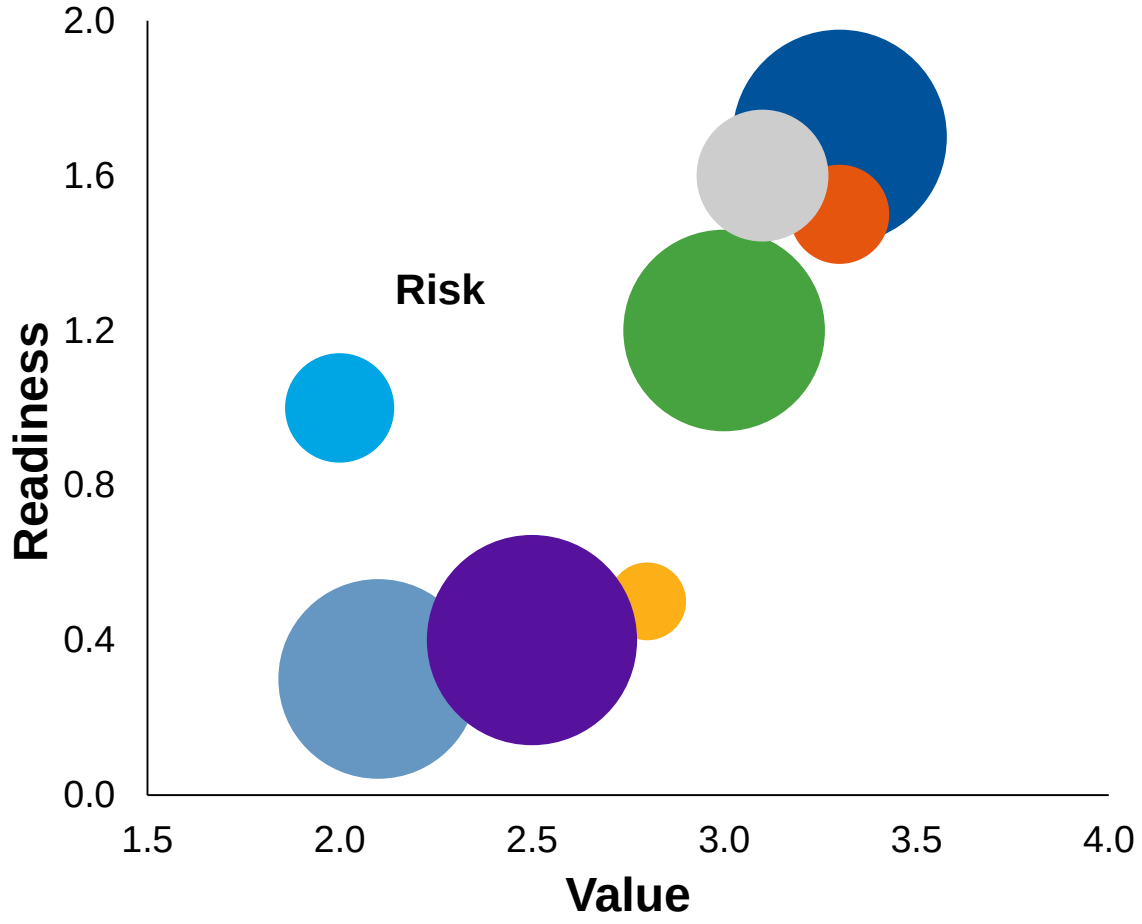
Build a Framework to Evaluate Opportunities, Look at Your Value Proposition and Readiness, Grill the Vendors

- Know the value proposition and know how value will be measured.
- Evaluate your vendors and test them for honest solutions.
- Measure ease to deliver across data, people, process and technology.
- Consider your risks. Know what they are so you can mitigate them in advance.



Recommendations

- ✓ Take action now and get ahead of the rapidly developing AI space. You will fail if you don't master AI basics.
- ✓ Make sure there is an effective methodology for evaluating and valuing AI investments. Know what problems you are trying to solve with AI.
- ✓ Develop a strategy for co-op'ing the technology into your business.
- ✓ Invest in augmenting IT competencies. Introduce bimodal (if you haven't already) and build your data science laboratory.

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Recommended Gartner Research

- **How to Make Smarter Decisions About Artificial Intelligence in Life Science R&D**
  Michael Shanler and Alexander Linden (G00311360)
- **Cool Vendors in AI for Healthcare, 2017**
  Laura Craft, Jeff Cribbs and Thomas J. Handler, M.D. (G00326265)
- **Hype Cycle for Artificial Intelligence, 2017**
  Kenneth F. Brant and Tom Austin (G00314732)
- **Ten Ways AI Will Appear in Your Enterprise – No One Source Can Meet All Your Business Needs**
  Tom Austin (G00335052)
- **Hype Hurts: Steering Clear of Dangerous AI Myths**
  Tom Austin, Alexander Linden and Mike Rollings (G00324274)

For more information, stop by Gartner Zone.

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This session examines the collision of AI innovations and life science expectations. AI is becoming pervasive in digital business settings and has high potential but it's unclear whether it can meet life science industry needs. Reviews contextualized examples (R&D, commercial) to reveal best practices of how to coop AI in life sciences.

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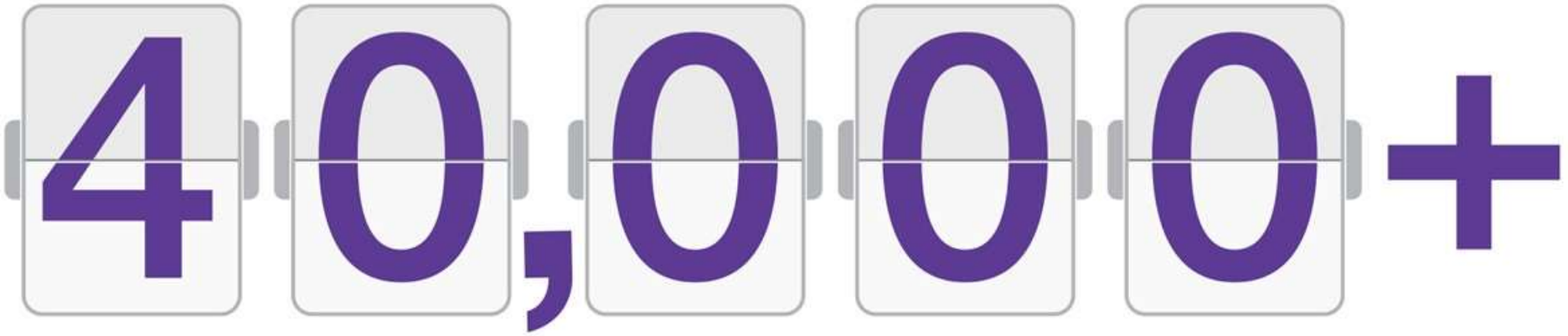

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