luxexecutivesummit 2018
Tokyo • October 17

Supercharging innovation with Data+Insight

Kevin See, Ph.D.
VP, Digital Products

Agenda

1 | The stagnation of the Innovation Process

2 | Data + Insight to get at What, Who, and When

3 | Evolving for better results


WORLD SERIES CHAMPIONS
BELTRA
15


TechRepublic.
How big data won the 2017 World Series
Learn what the Houston Astros did to win the analytics arms race in Major League Baseball.
The Boston Globe
Astros at leading edge of analytics and their success is proof positive
SPORTINGNEWS
Astros are winning at new, old numbers games


TRADITIONAL


TRADITIONAL


The sweet spot
Scoring value (LWTS) of batted balls based on launch angle and speed off the bat, 2015 MLB
SCORING VALUE
◀ BELOW
ABOVE AVG. LWTS ▶
AVG.
Pop-ups ▲
50°
Fly balls
Home runs
25
Line drives
10
Ground balls ▼
0
Launch angle
ADVANCED ANALYTICS
−25
−50
40mph
60
80
100
120
Exit velocity
Minimum five batted balls per bin
FIVETHIRTYEIGHT
SOURCE: BASEBALL SAVANT

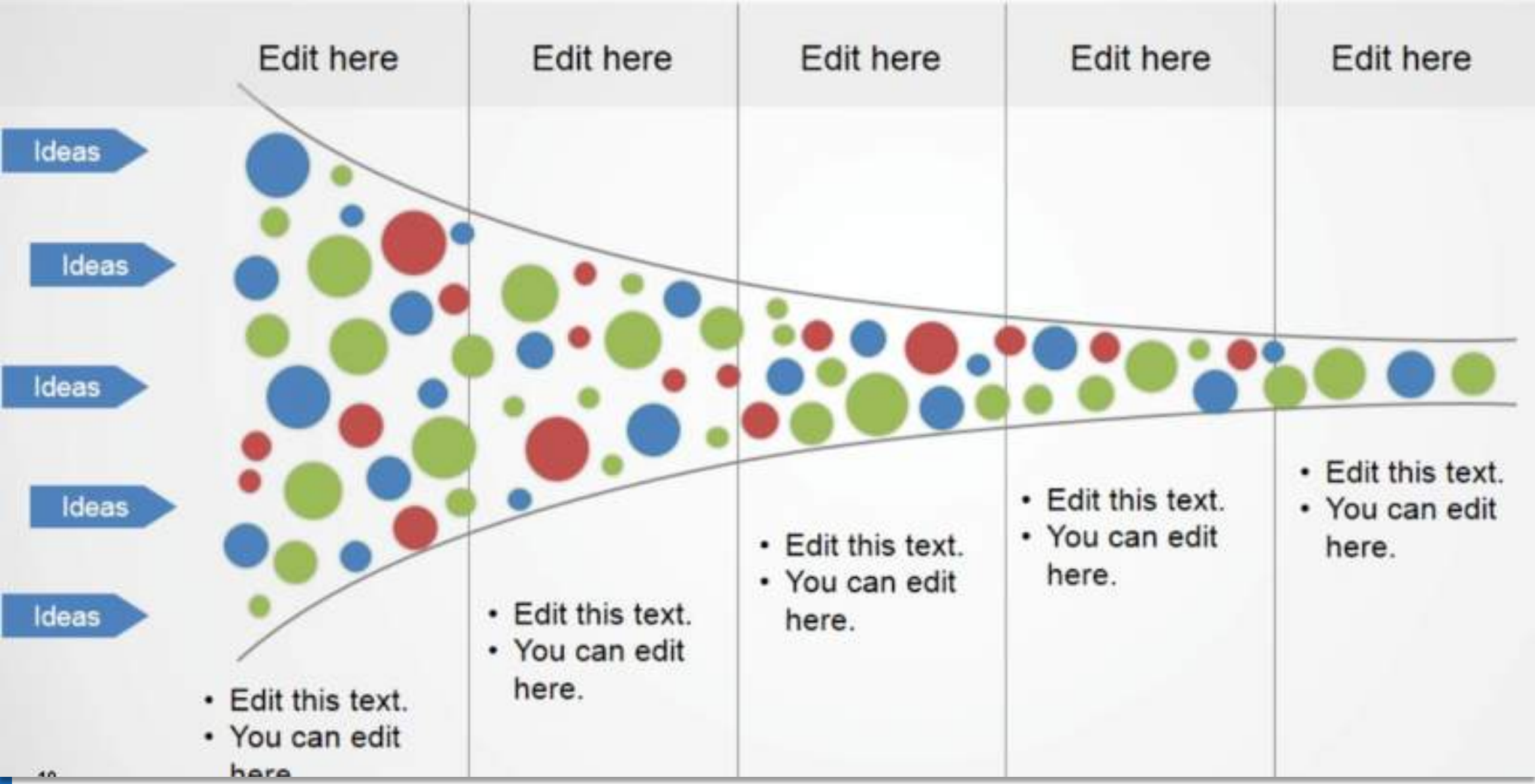
> Analytics is about helping player development, managers and coaches to make better decisions; better decisions than what your competitors are making.

Bill Schmarzo, CTO of Dell Global Services, Big Data

Luhnow recognized the incentives for losing baked into what was then a new collective bargaining agreement. The worst teams would have much more money to spend on amateur talent. **A few years of struggle could lead to many years of success**.

Year	Team	League	Wins	Losses	%
2017	Houston Astros	American League	101	61	.623
2016	Houston Astros	American League	84	78	.519
2015	Houston Astros	American League	86	76	.531
2014	Houston Astros	American League	70	92	.432
2013	Houston Astros	American League	51	111	.315
2012	Houston Astros	National League	55	107	.340

How the Houston Astros Finally Hit on a Formula That Worked for Them; **NY Times**



The Ubiquitous Innovation Funnel

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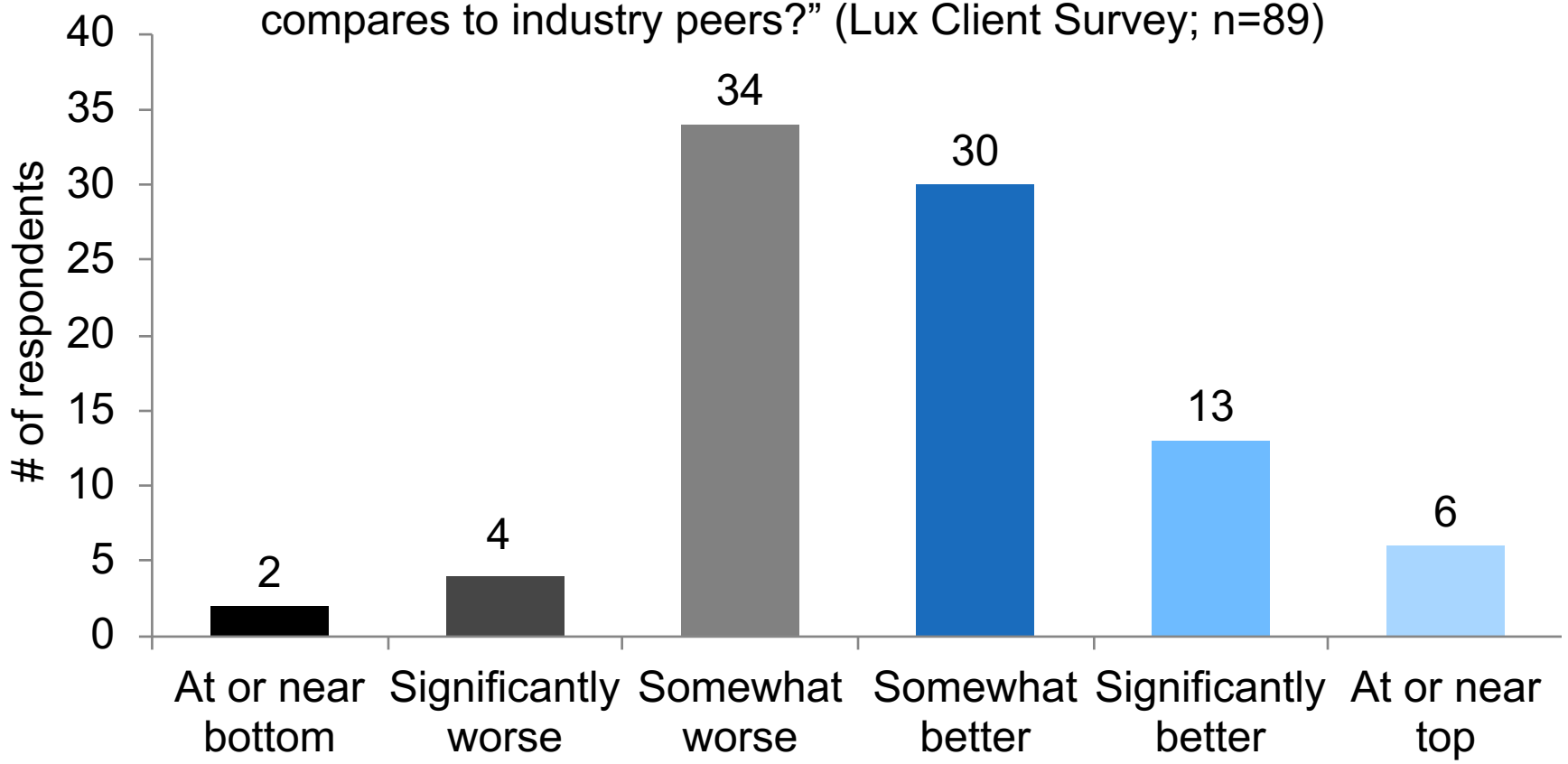
2013:
Most see innovation results as modest

"Overall, how do you think the success of your program compares to industry peers?" (Lux Client Survey; n=89)



"I don't have any home runs to talk about. Have quite a few singles and doubles – some that are still growing, could become a triple or a home run."

"We find a lot of singles, haven't found a home run. It's not hard, over the course of year, to find a single or two."

2018:
The challenges remain the same

Solution:
Data + Insight

Approaches to spotting transformational technologies tend to fall into one of two camps

TRADITIONAL FORESIGHT

Characteristics	
Examine broad themes (megatrends) Study markets and tech trends Get smart people to make judgments	
Challenges	
Unreliable – vulnerable to bias Still easy to miss some key trends Often still a lagging indicator	

Approaches to spotting transformational technologies tend to fall into one of two camps

TRADITIONAL FORESIGHT	AUTOMATED DATA
Characteristics	
Examine broad themes (megatrends)	Access to various data sources
Study markets and tech trends	Look for trends and correlations
Get smart people to make judgments	Search interface and visualizations
Challenges	
Unreliable – vulnerable to bias	Lacks context and insight
Still easy to miss some key trends	Contributes to information overload
Often still a lagging indicator	Often still a lagging indicator

Approaches to spotting transformational technologies tend to fall into one of two camps

TRADITIONAL FORESIGH	TED DATA
Examine broad themes (m	s data sources
Study markets and tech tr	nd correlations
Get smart people to make	and visualizations
Unreliable – vulnerable to bi	nd insight
Still easy to miss some key tre	o information overload
Often still a lagging indicator	a lagging indicator

We need a way to synthesize the best of both

TRADITIONAL FORESIGHT CHALLENGES

The perils of fallible insight

1999

The Economist

"**In the early 1980s AT&T asked McKinsey to estimate how many cellular phones would be in use in the world at the turn of the century.** The consultancy noted all the problems with the new devices—the handsets were absurdly heavy, the batteries kept running out, the coverage was patchy and the cost per minute was exorbitant—and concluded that the **total market would be about 900,000.** At the time this persuaded **AT&T to pull out of the market**, although it changed its mind later.

These days **900,000 new subscribers join the world's mobile-phone services every three days**"

The perils of fallible insight

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2006

ZDNet

Gartner: Apple should quit hardware business

The future success of Apple, Dell and Intel lies with a licensing deal between Steve Jobs' company and the PC maker according to analyst Gartner

By Andrew Donoghue | October 18, 2006 -- 15:55 GMT (08:55 PDT) | Topic: Innovation

AUTOMATED DATA CHALLENGES

The perils of automation

Google News

EXAMPLE NEWS ALERT FOR TOYOTA

I'm Turning A Salvage Toyota 86 From Hurricane Harvey For Charity

Jalopnik · 3h ago

Should Value Investors Pick Toyota Motor (TM) Stock?

Zacks.com · 7h ago

Driving the Toyota C-HR R-Tuned, a 600-HP Compact Crossover That Wants to Kill You

The Drive · Mar 29, 2018

RELATED COVERAGE

New Toyota RAV4 revealed with hybrid powertrain

AutoExpress

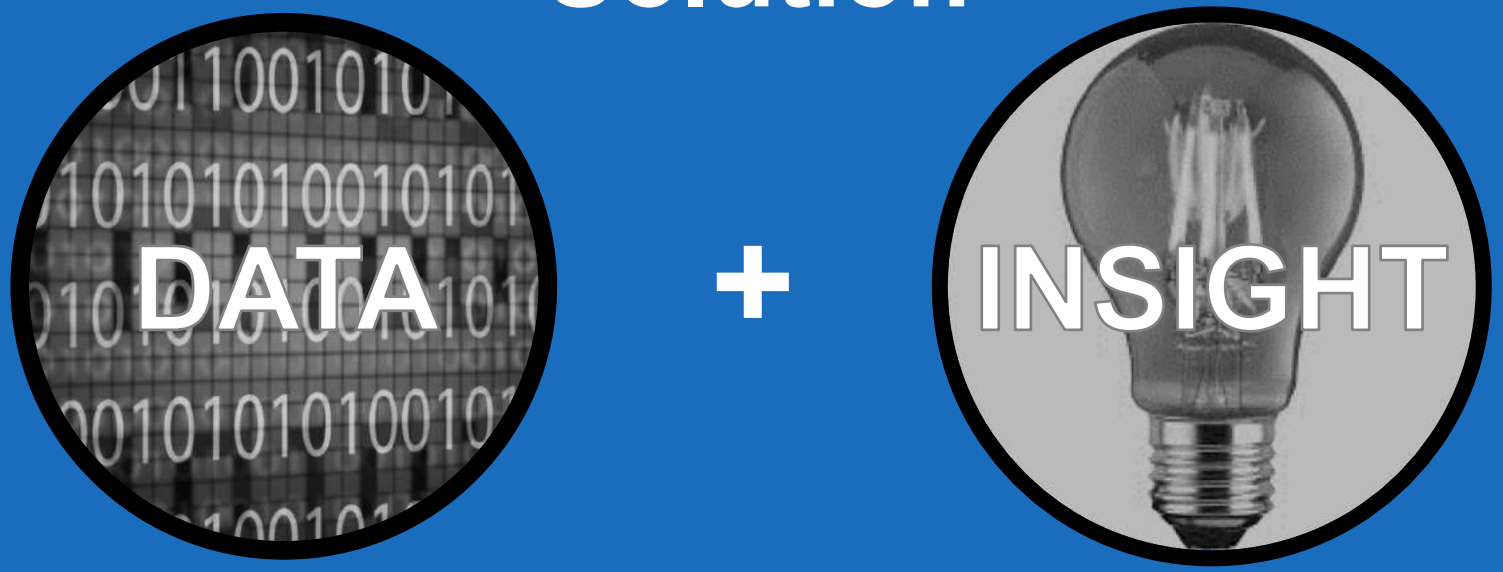
What to Expect at Richmond Raceway's 2018 Toyota Series NASCAR Event

The Drive · Mar 31, 2018

Toyota Launches Production Model "Sora" Fuel Cell Bus

Composites Manufacturing Magazine · Apr 2, 2018

Solution

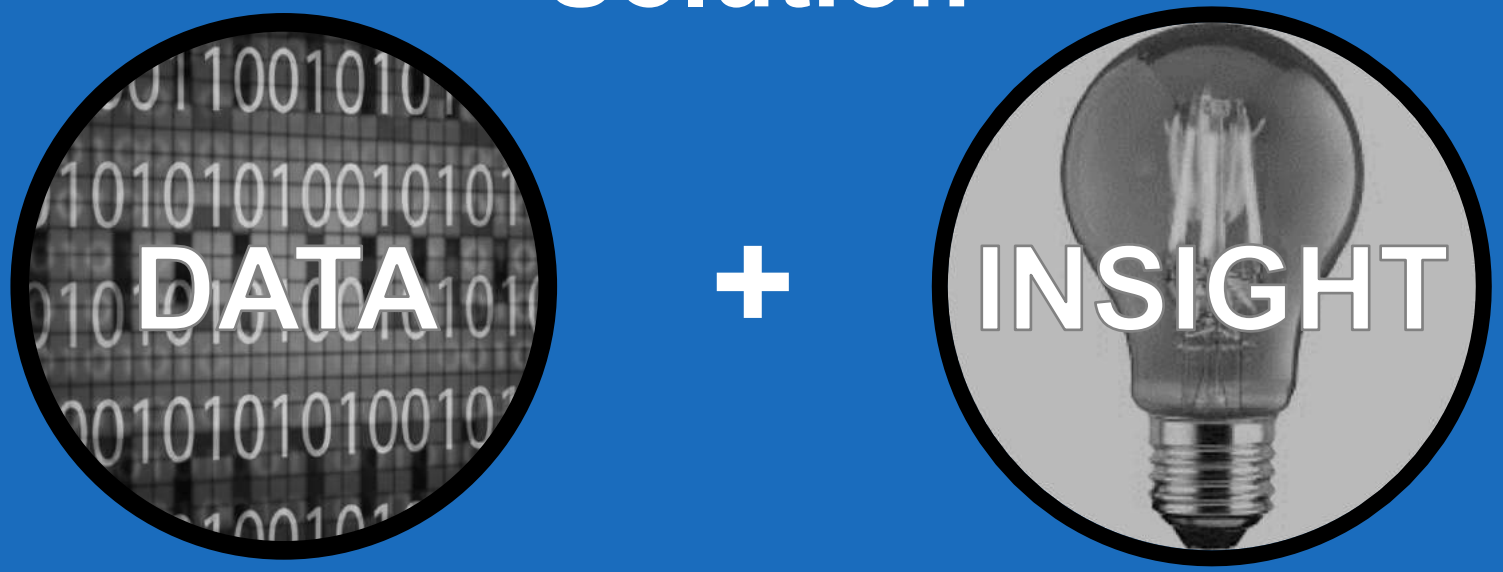


Expert curation of data and advanced analytics

Domain knowledge sorts the significant from the spurious

Insight on what it means – and what to do about it

Solution



Goals:

- **Improve our win rate**
- **Make our wins bigger**
- **Make our innovation efforts *indispensable* for growth**

Agenda

1 | The stagnation of the Innovation Process

2 | **Data + Insight to get at What, Who, and When**

3 | Evolving for better results


What?
Who?
When?

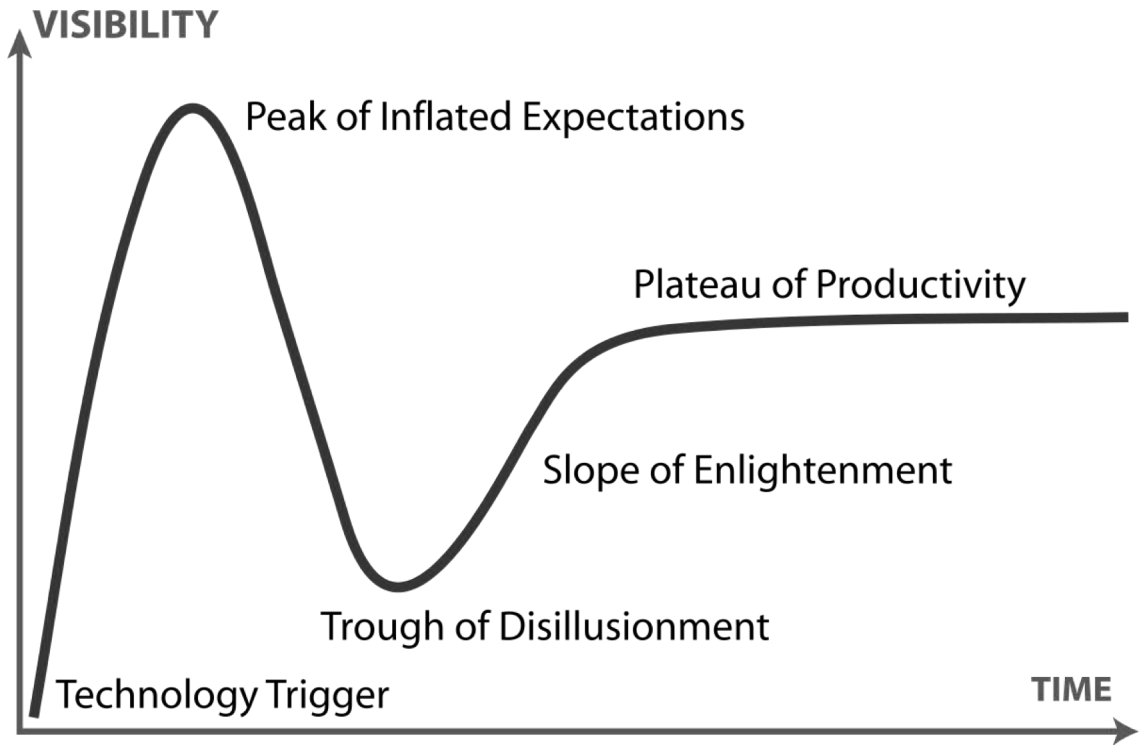

What?
MakerBot

What?

TRADITIONAL FORESIGHT

What technologies should you prioritize?

QUALITATIVE FRAMEWORKS



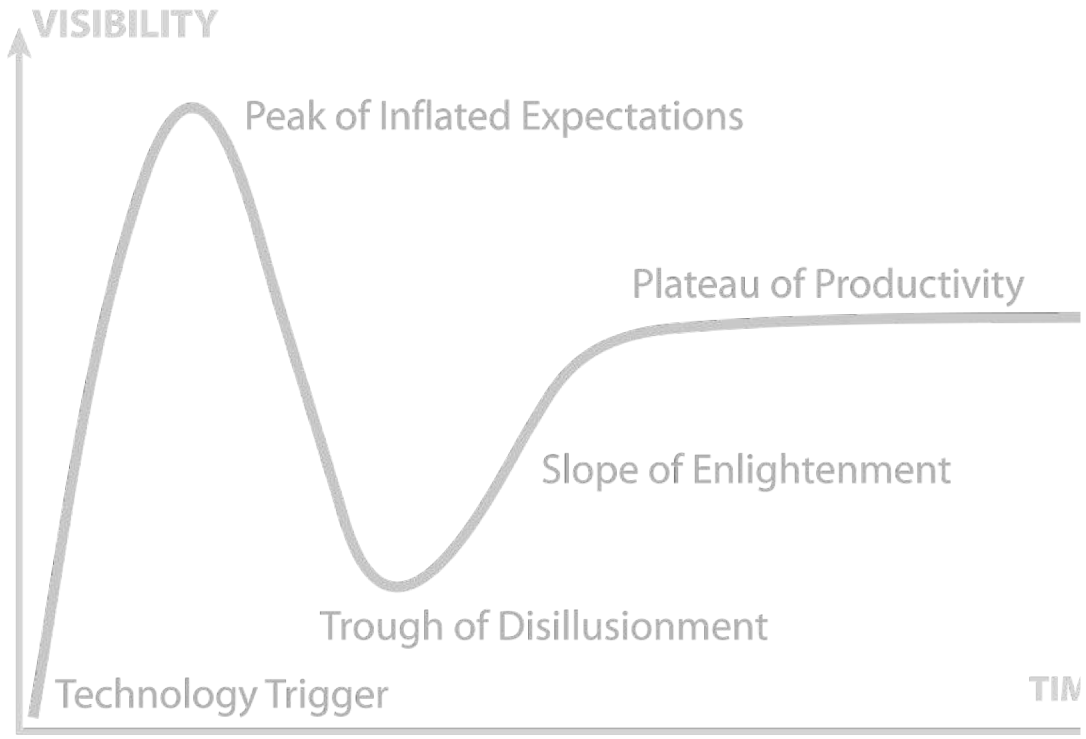
Source: Gartner, Wikipedia

What?

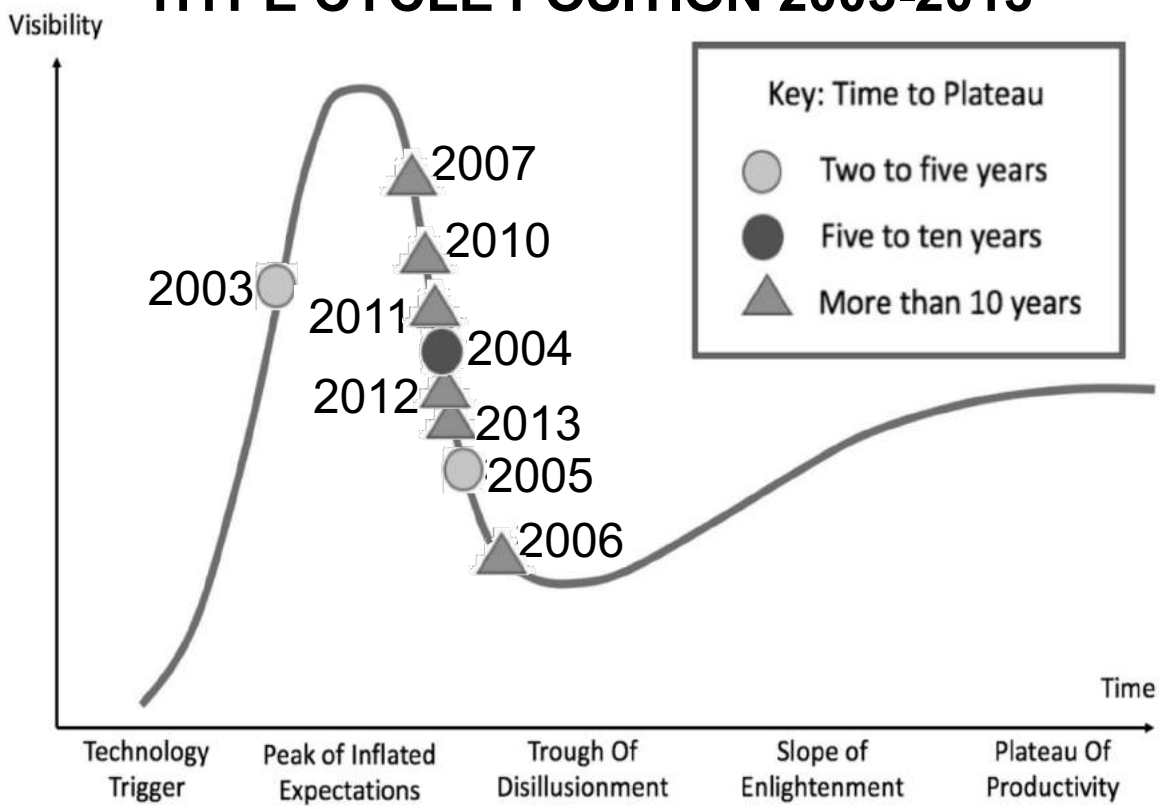
TRADITIONAL FORESIGHT

What technologies should you prioritize?

QUALITATIVE FRAMEWORKS



MESH NETWORKS HYPE CYCLE POSITION 2003-2013



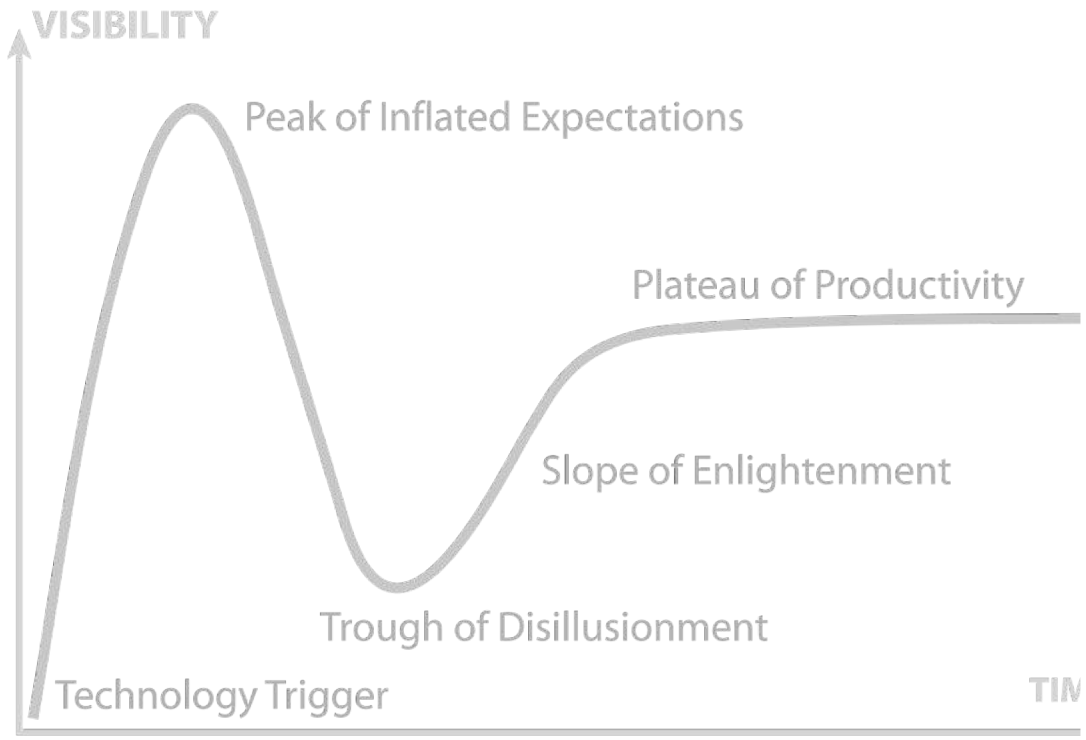
Source: Gartner, Wikipedia, Icon Ventures

What?

TRADITIONAL FORESIGHT

What technologies should you prioritize?

QUALITATIVE FRAMEWORKS



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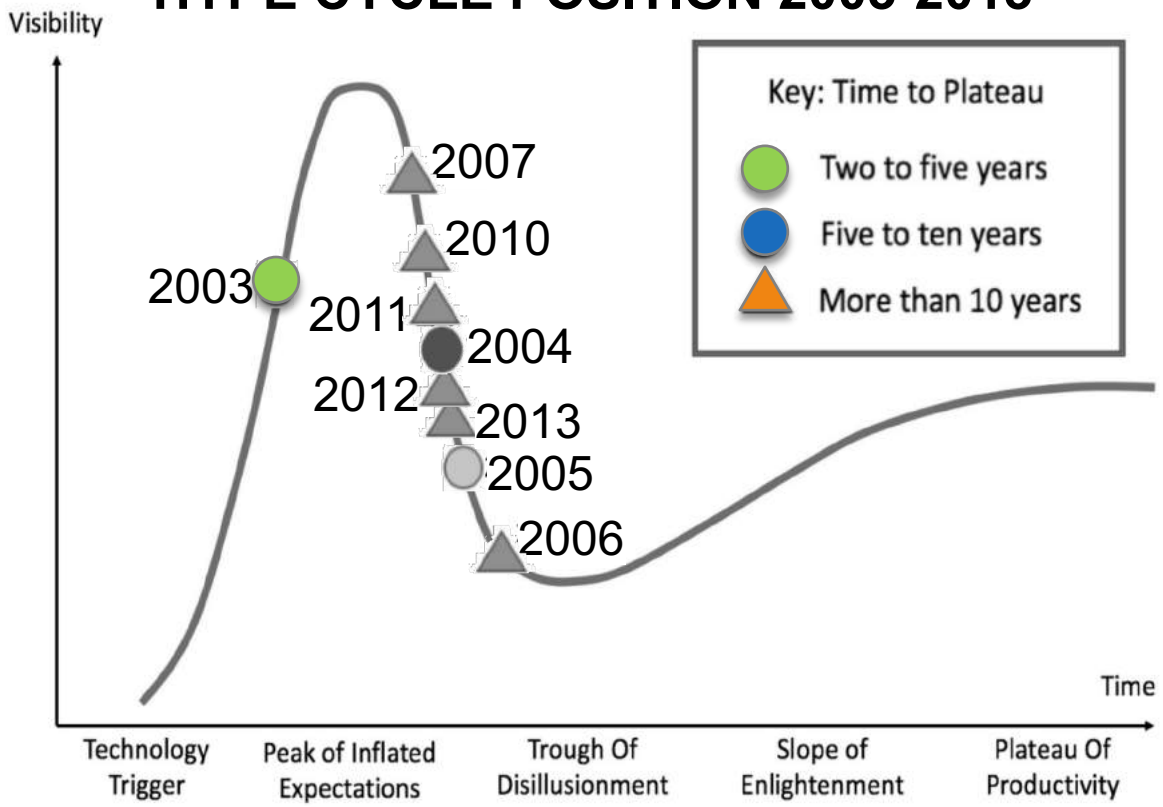

Source: Gartner, Wikipedia, Icon Ventures

What?

TRADITIONAL FORESIGHT

What technologies should you prioritize?

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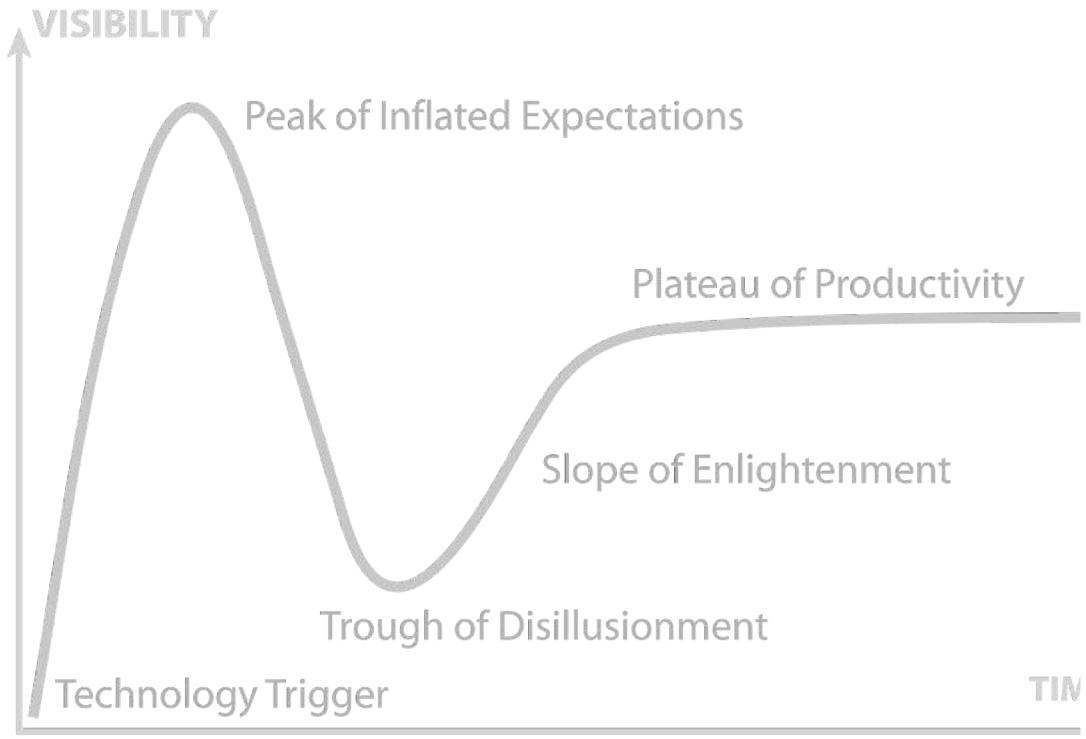

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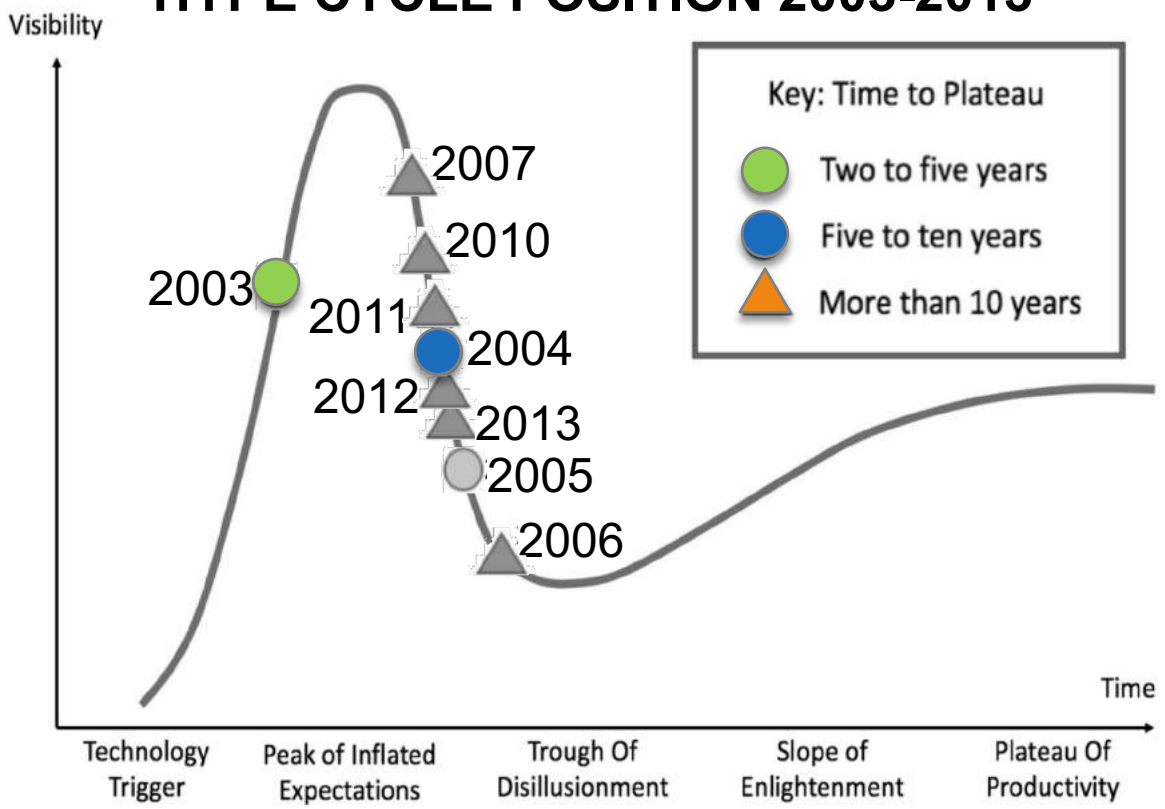

Source: Gartner, Wikipedia, Icon Ventures

What?

TRADITIONAL FORESIGHT

What technologies should you prioritize?

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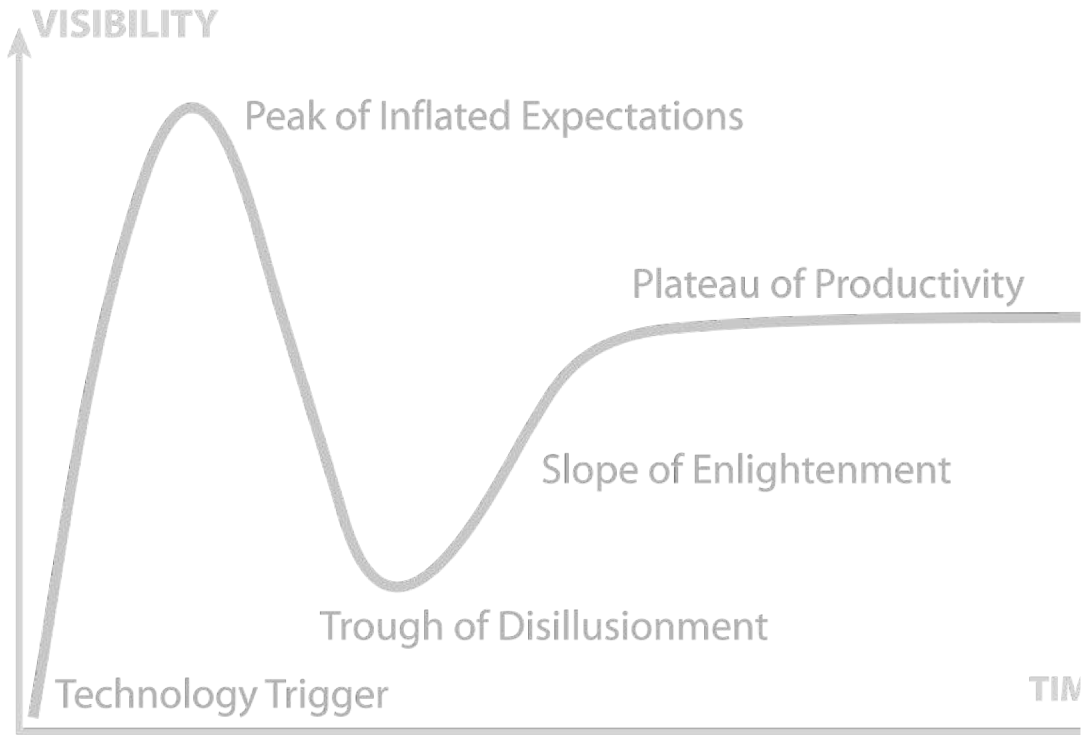

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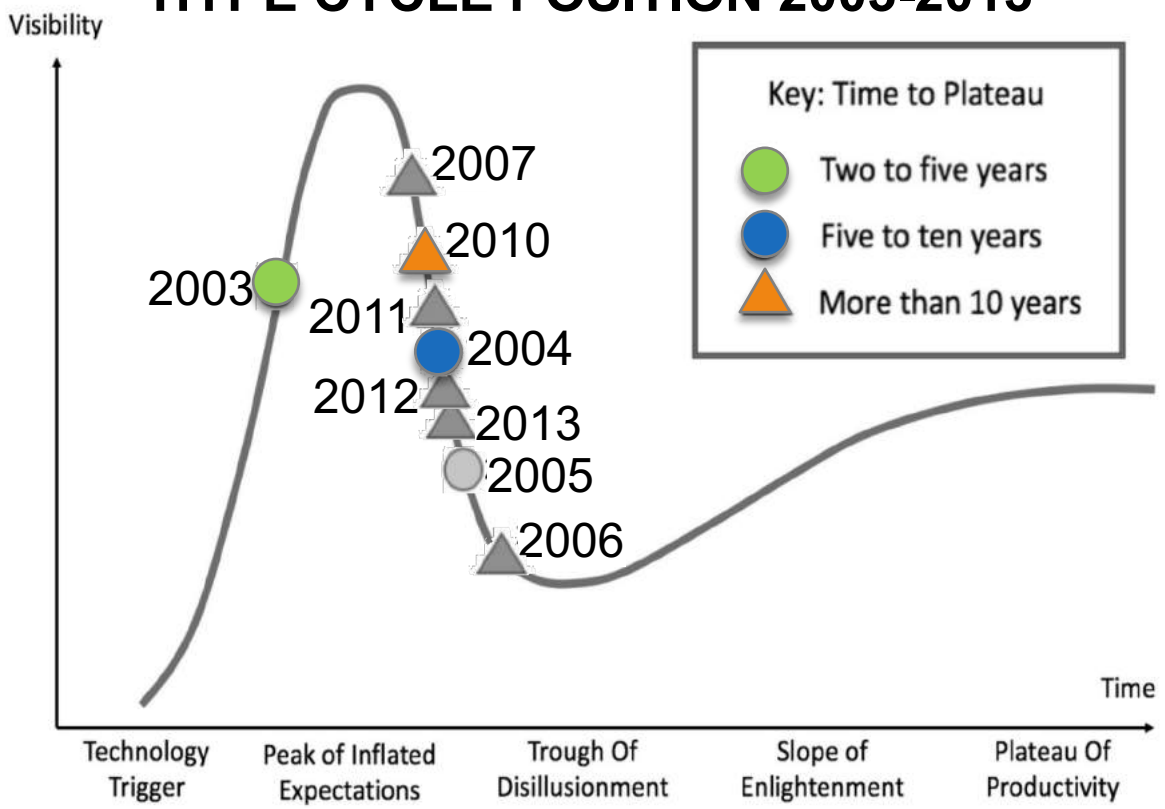


Source: Gartner, Wikipedia, Icon Ventures

What?

TRADITIONAL FORESIGHT

What technologies should you prioritize?

> “It's remarkable the number of major technologies from the last 20 years that were either identified late or simply never appeared on a Hype Cycle”
>
> - Michael Mullany, Icon Ventures

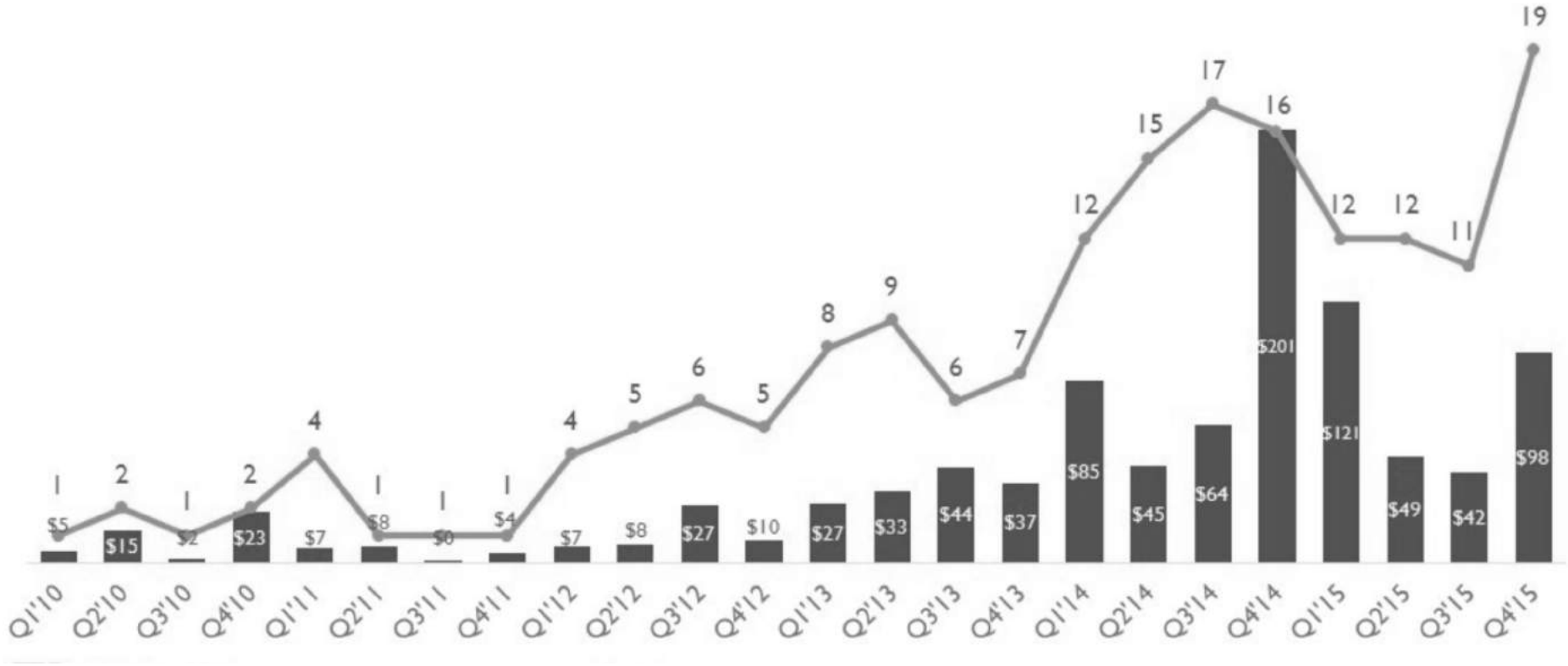
Source: Gartner, Wikipedia

What?

AUTOMATED DATA

What technologies should you prioritize?

VC FUNDING



Source: CB Insights

What?

AUTOMATED DATA

What technologies should you prioritize?

VC FUNDING

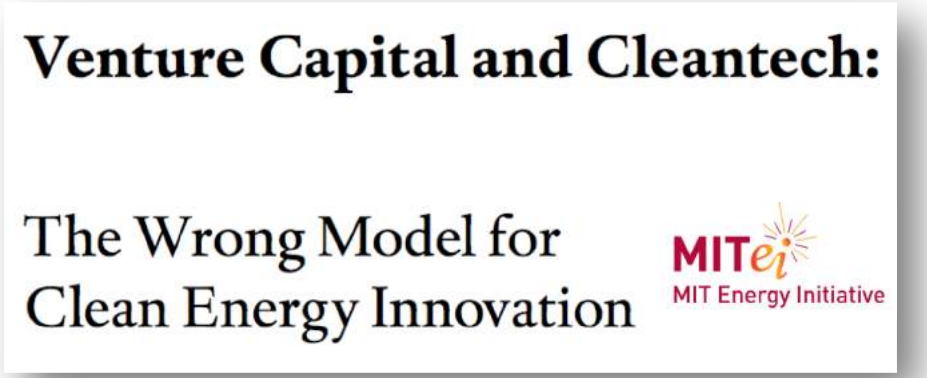
> If you saw the level of due diligence in vetting some companies – you'd be appalled.
>
> - Anonymous Private VC

What?

AUTOMATED DATA

What technologies should you prioritize?

VCs struggle outside of software



What?

AUTOMATED DATA

What technologies should you prioritize?

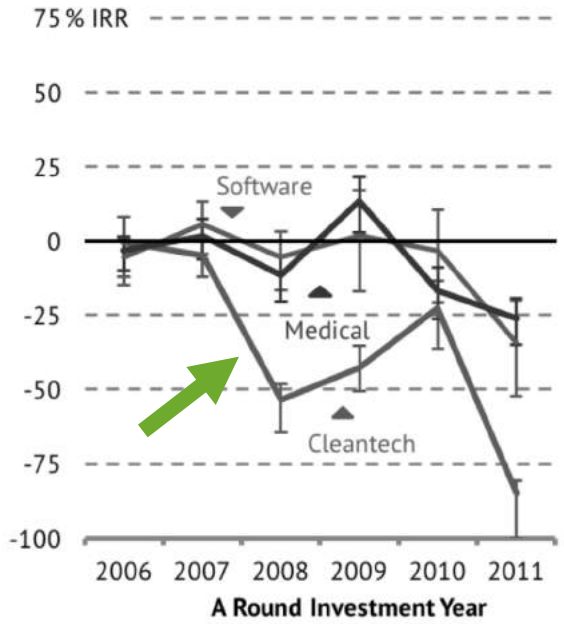
VCs struggle outside of software

Venture Capital and Cleantech:

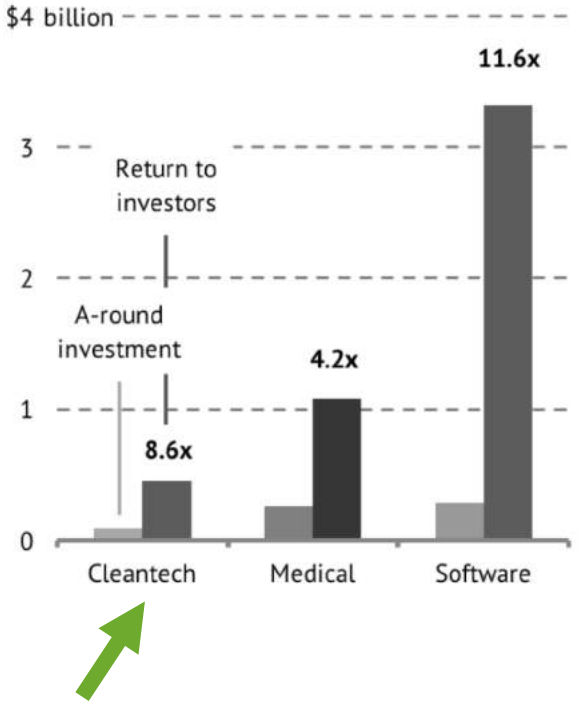
The Wrong Model for Clean Energy Innovation

MITei MIT Energy Initiative

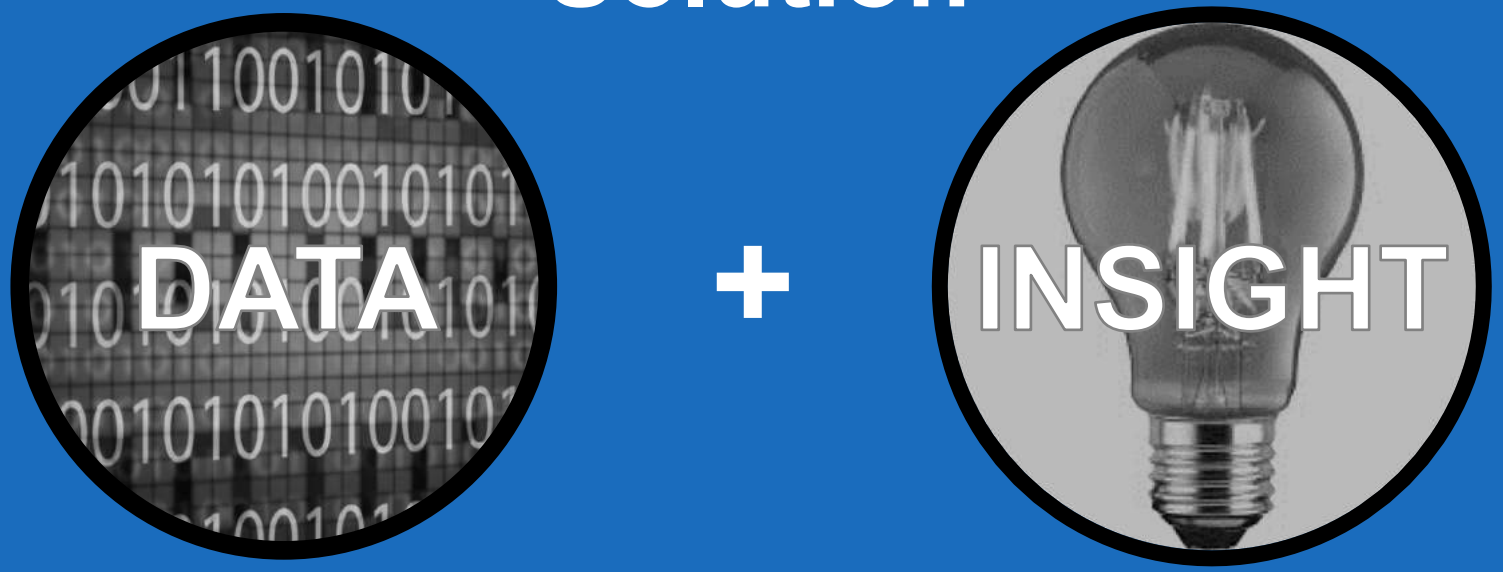
IRR



ROI



Solution



The Lux Tech Signal

Lux Tech Signal (LTS) methodology

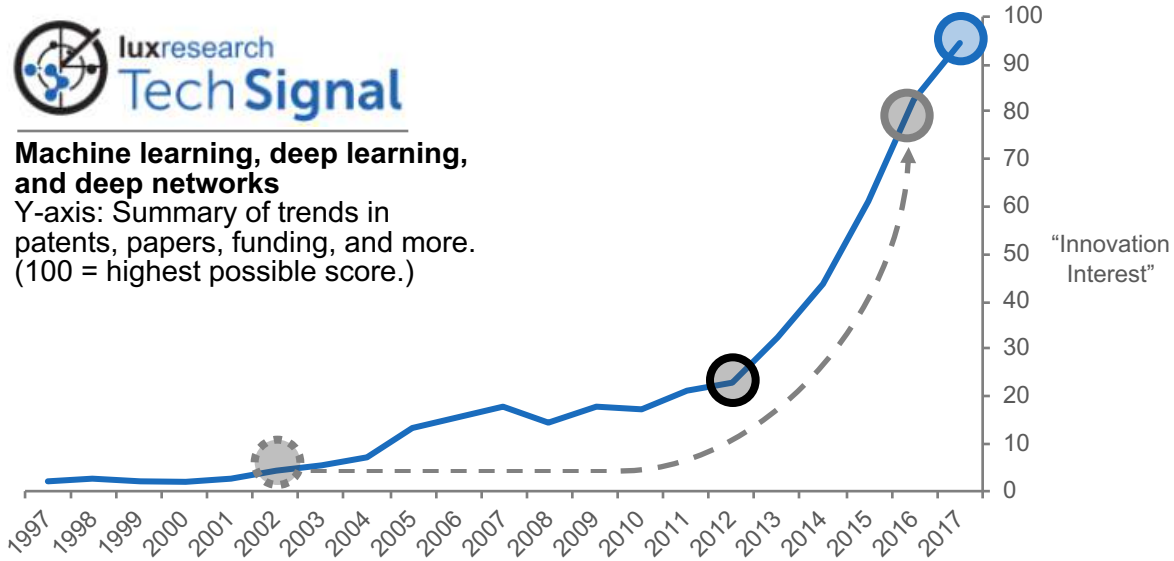
The Lux Tech Signal is based on our analysis of innovation data including:

- Patents
- Academic papers
- VC funding
- Government funding
- Lux proprietary data

The **Innovation Interest** score is calculated by analyzing multiple, diverse datasets weighted based on our evaluation of the role innovation sources play in each stage of commercial technology development; empirically tested and validated against real world historical data.

The maximum possible score is 100, indicating the highest observed rate of research, patenting, funding, etc.

EXAMPLE:

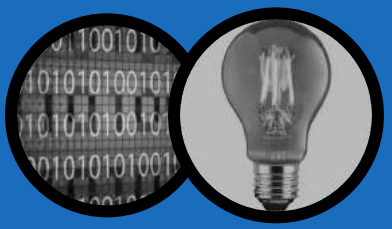


- **Changes over time** signal growing (or shrinking) innovation interest.
- **Inflection points** may point to commercial opportunities or challenges ahead.
- **Current value** indicates innovation maturity, distinguishing established technologies from those that are still emerging.

What?

DATA + INSIGHT

What technologies should you prioritize?



18 for 2018

Executive Summary: Top technologies Lux is following in 2018, using data from the Lux Intelligence Engine and analysts' insight

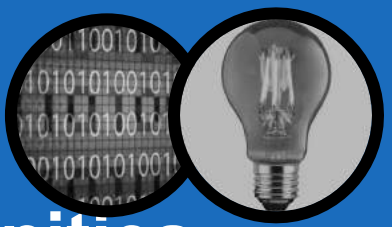
A ranking of the most important technologies to watch, given their potential to transform the world in the next decade

1. **Machine Learning and Deep Neural Networks**
   30% annual increase in machine learning patents
2. **3D Printing and Additive Manufacturing**
   Lux expects 3D printing to be a $20 billion market by 2025
3. **Genome Editing**
   $1.2 billion in VC funding to impact industries from food to health care
4. **5G Networks**
   Over 70,000 patents set the stage for 5G network launches in 2018
5. **Microbiome**
   Harnessing the power of microbes for nutrition, agriculture, and more
6. **Solid-state Batteries**
   Safer and better batteries, pursued by start-ups and giants like Toyota
7. **Synthetic Biology**
   A recent $275 million round for Ginkgo Bioworks highlights the potential
8. **Augmented Reality (AR)**
   Enterprise applications are coming now, on heels of $4.4 billion in funding
9. **Smartwatches**
   Patents soar from near zero to over 23,000 in less than five years
10. **Wireless Charging**
    Here now for consumer electronics, with R&D pushing for EV uses
11. **Materials Informatics**
    Using IT and AI to break out of slow material development cycles
12. **IoT Security**
    Patents are up 13x as connected devices proliferate
13. **Edge Computing**
    When milliseconds matter, analytics can be local, not in the cloud
14. **Energy Distribution System Monitoring**
    Growing demand and renewables require tech to balance the grid
15. **Polyethylene Furanoate (PEF)**
    Innovation has grown at an 87% annual rate to improve on PET
16. **Sugar Reduction**
    Over 162,000 patents to combat health ills from too much sugar
17. **Neural Interfaces**
    Tech to read and stimulate the brain will see growing validation in 2018
18. **Syngas and Power-to-Gas**
    Producing fuels from CO_2 to drive the energy transition

What?

DATA + INSIGHT FOR PRIORITIZING TECHNOLOGIES

Segment mature areas from emerging opportunities



Y-Axis: Innovation track record

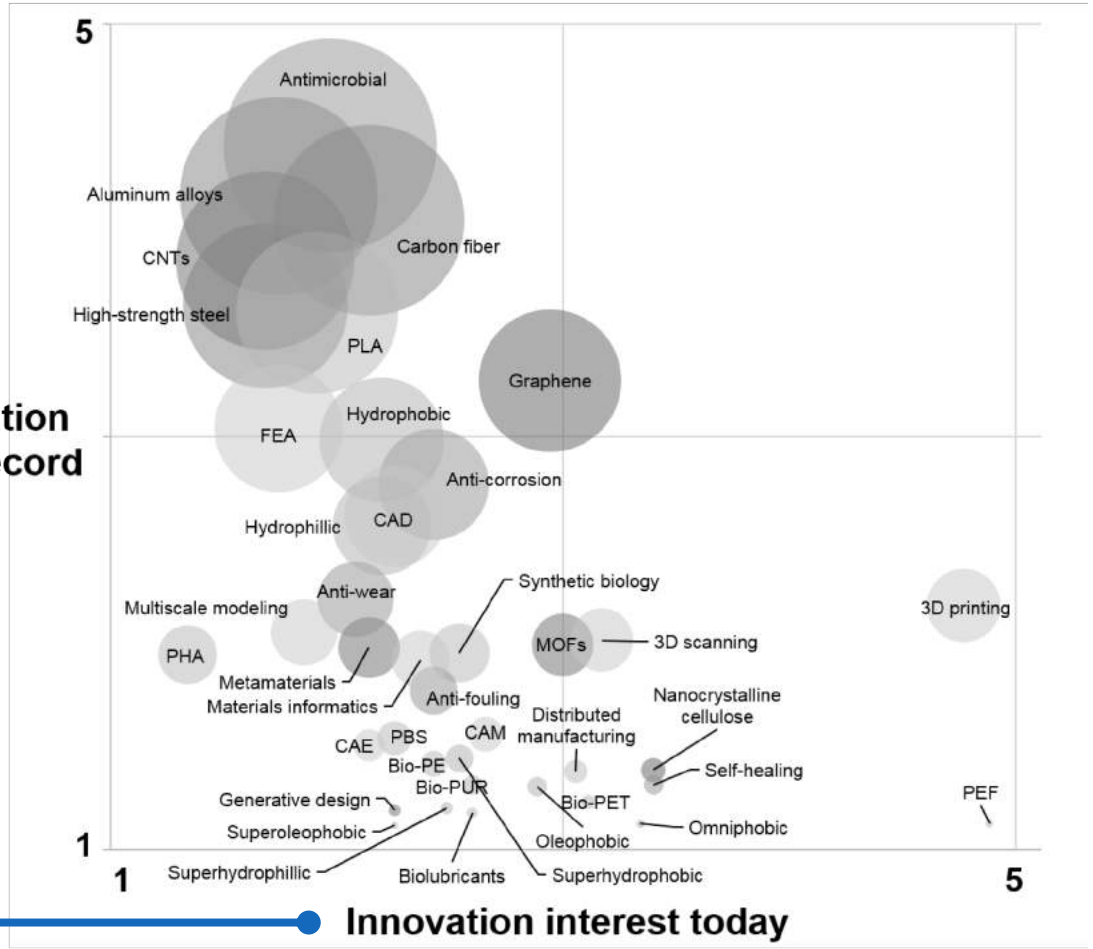
Cumulative number of papers and patents in the past 20 years.

Determines dot size.

X-Axis: Innovation interest today

What is receiving the most interest.

Calculated based on rate of new patents, papers, and funding.



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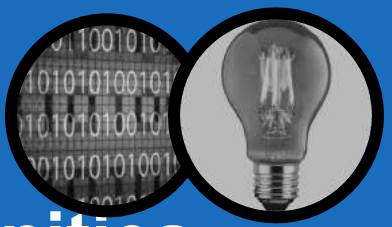
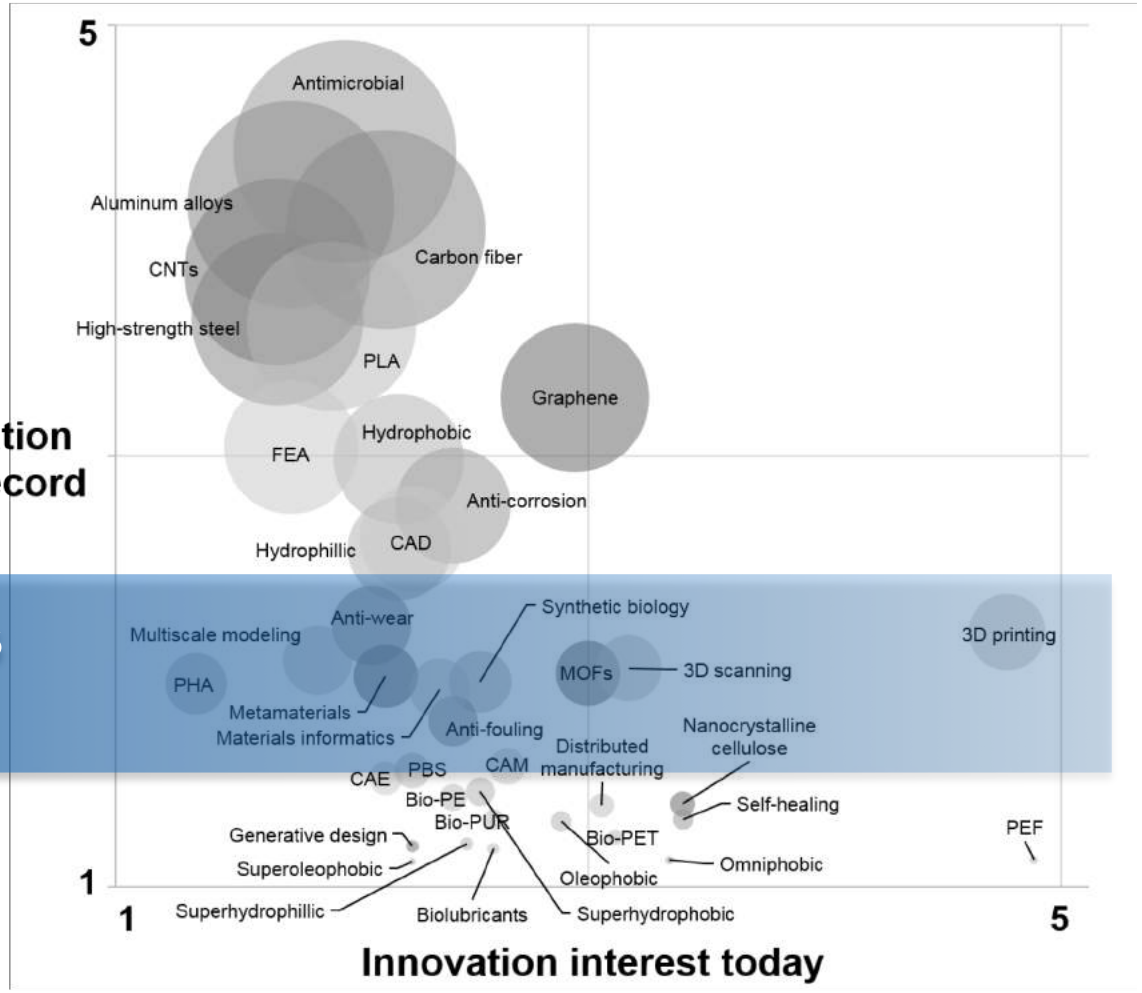


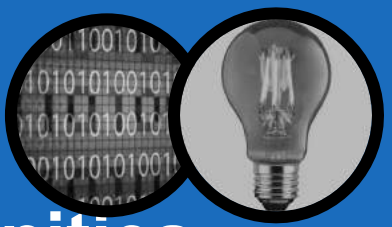


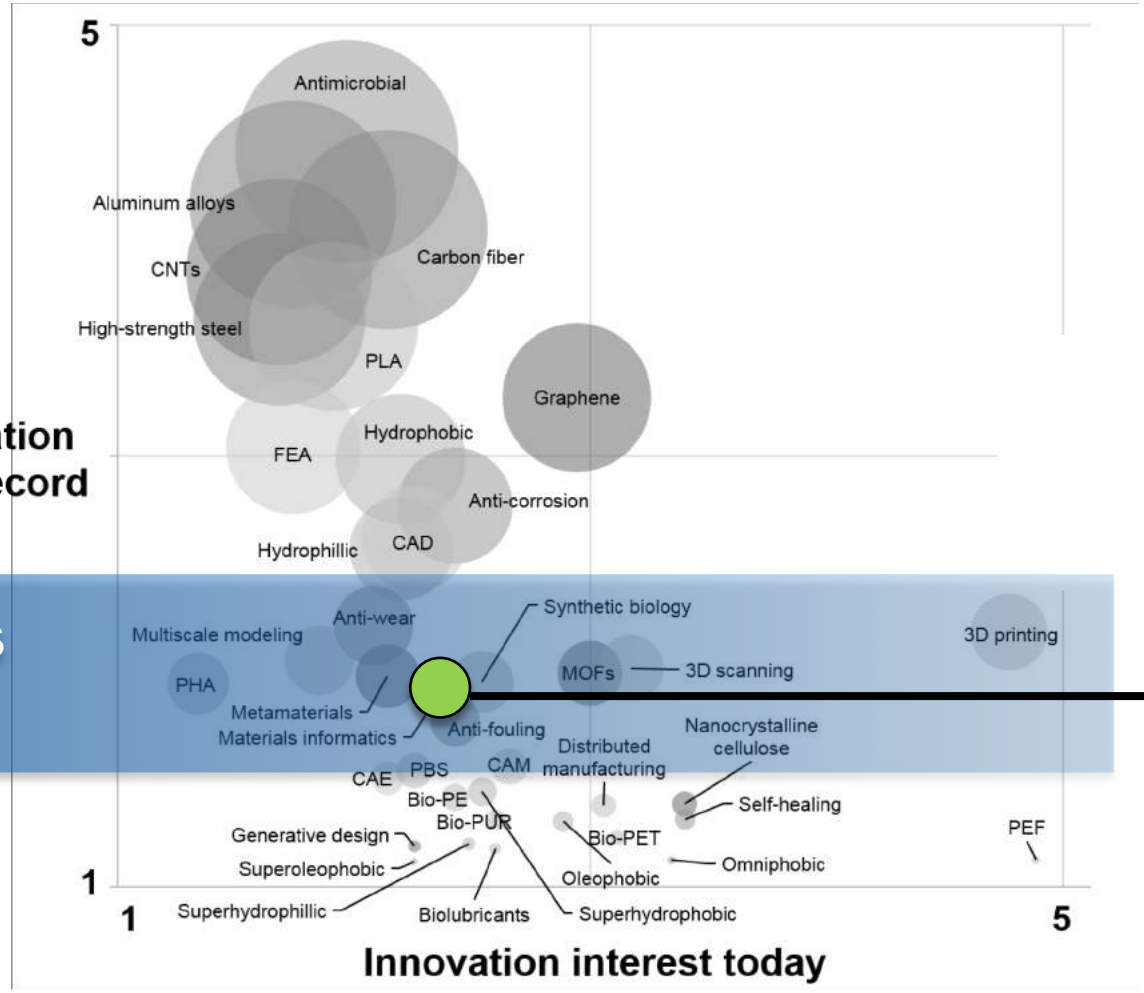
Emerging innovations “sweet spot”

What?

DATA + INSIGHT FOR PRIORITIZING TECHNOLOGIES

Segment mature areas from emerging opportunities





Emerging innovations "sweet spot"

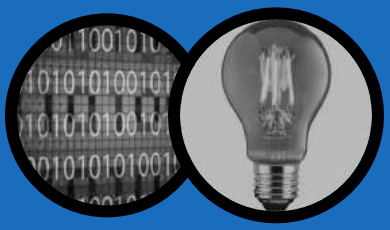
Example:

Materials Informatics

What?

DATA + INSIGHT FOR PRIORITIZING TECHNOLOGIES

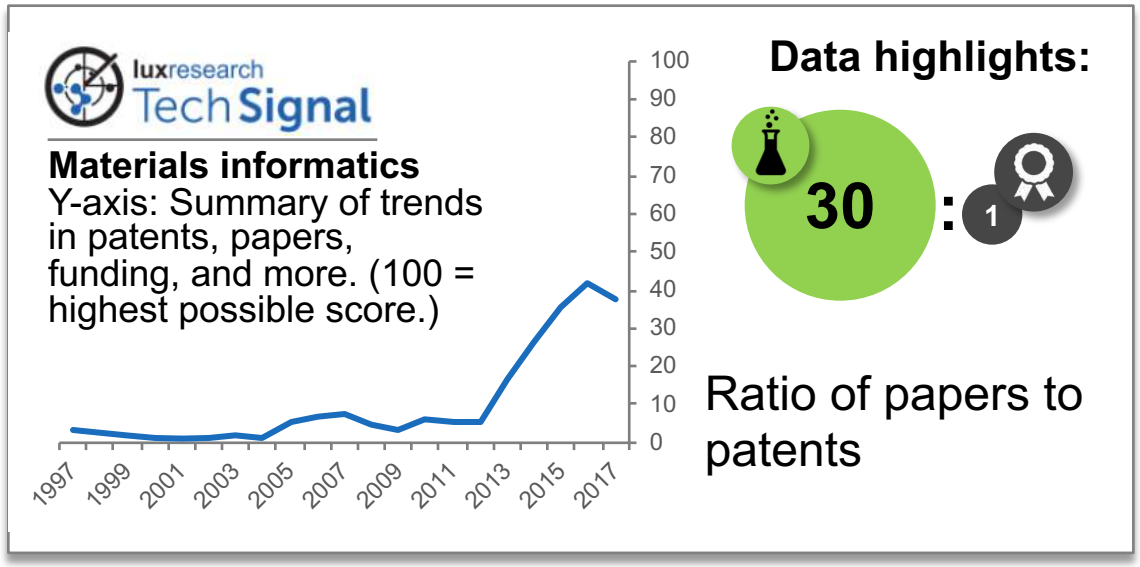
Materials Informatics



DESCRIPTION

Use of data science and artificial intelligence methods to:

- extract insights from existing materials
- discover new materials matching desired property requirements



KEY BENEFITS

Accelerates materials and chemicals research and product development timelines

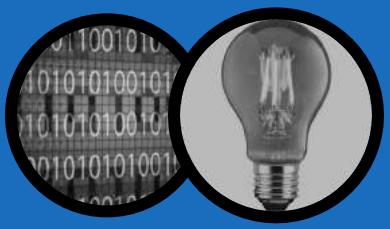
Extracts additional value from existing experimental and computational data, leveraging past R&D spending

Optimizes experimental designs to attain the most valuable data per experiment

What?

DATA + INSIGHT FOR PRIORITIZING TECHNOLOGIES

Materials Informatics



LUX TAKE BY APPLICATION READINESS FOR MATERIALS INFORMATICS

Application	Data Availability	Experimental Data Cleanliness	Maturity for Machine Learning	Average	Lux Take
Small Molecules	4.7	4.7	4.7	4.7	Strong Positive
Alloys	3.3	3.9	4.5	3.9	Positive
Semiconductors	3.3	3.6	3.6	3.5	Positive
Polymers	2.4	2.9	4.0	3.1	Positive
Pharmaceuticals	3.0	3.0	3.0	3.0	Caution
Glass	2.6	3.0	3.1	2.9	Wait and See
Additive Manufacturing	2.0	2.2	3.8	2.7	Wait and See
Batteries	2.4	2.1	3.1	2.5	Caution
Heterogeneous Catalysis	2.3	1.9	2.1	2.1	Caution


Horizontal Solutions
Analytics
augur
BLOCKCHAIN INTELLIGENCE GROUP
CHAINALYSIS
Skry
Contracts
Counterparty
ZEPPELIN
ETHERPARTY
RSK
Sharing
slock.it
La'Zooz
BACKFEED
Dev Tools
blockstack
BlockApps
openchain
FACTOM
Identity
SIGNICA
UNIQUID
Dominant Core Infrastructure Enablers
bitcoin
HYPERLEDGER
ETHEREUM
Enterprise Contributors
IBM
THE LINUX FOUNDATION
pwc
NTT DATA
WELLS FARGO
intel
Broadridge
SAMSUNG
BNP PARIBAS
BNY MELLON
vmware
JPMorganChase
Deloitte.
cisco
HITACHI
Vertical Solutions
Finance
SETL.io
Energy
LO3 ENERGY
Supply Chain
CHRONICLED
PROVENANCE
IoT

Who?


Search

Who?

TRADITIONAL FORESIGHT

Few are immune to hype

2015

MIT Technology Review

magic leap

10 Breakthrough Technologies

Who?

TRADITIONAL FORESIGHT

Few are immune to hype

2015

MIT Technology Review

magic leap

10 Breakthrough Technologies

2017

luxresearch

magic leap

Magic Leap's Mixed Reality

Magic Leap is a mixed reality company currently valued at $6 billion that has raised $1.5 billion in funding with no product to show. Rumors of wondrous technical feats followed by massive

Since then, the shiny veneer of this unicorn has started to crack, and its technology claims appear to be highly exaggerated.

and its technology claims appear to be highly exaggerated. In this report, we examine the company's history and patent portfolio to understand Magic Leap's mix of hype and reality.

Who?

TRADITIONAL FORESIGHT

Few are immune to hype

2015

Inc.

theranos

How Elizabeth Holmes Became America's New Entrepreneurial Icon

Who?

TRADITIONAL FORESIGHT

Few are immune to hype

2015

Inc.

theranos

How Elizabeth Holmes Became America's New Entrepreneurial Icon

2018

The Washington Post

theranos

Theranos chief executive Elizabeth Holmes charged with massive fraud

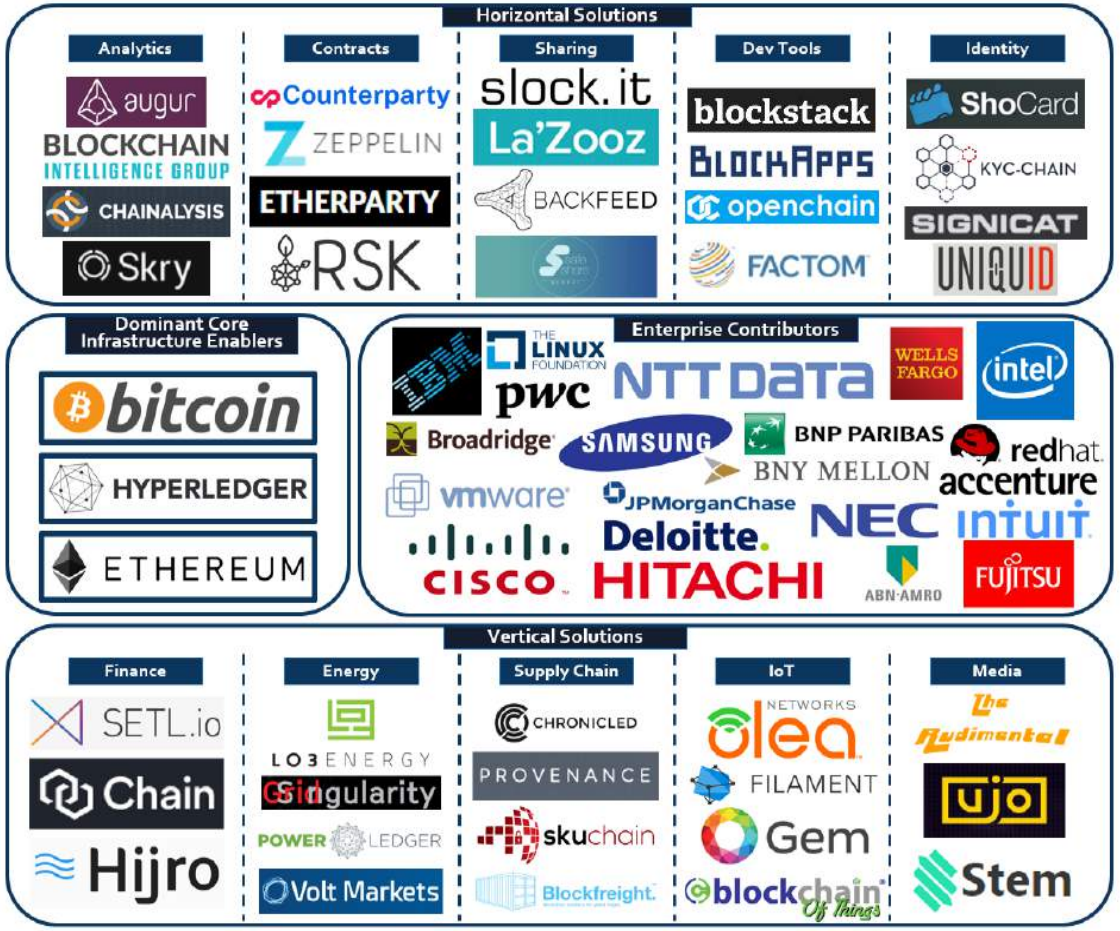
Who?

AUTOMATED DATA

Cherry-picking logos gets you only part of the way

Example:

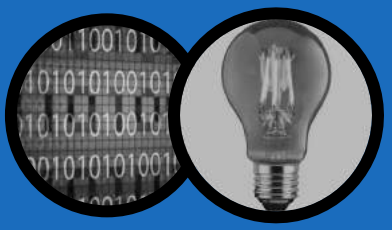
LUX BLOCKCHAIN LANDSCAPE 2016



Who?

DATA + INSIGHT FOR WHO TO WORK WITH

Key player analysis (for Deep Learning)



Use data

Patents, investment, academic publications – to surface leading players

Using data science, segment into:

1) large players
2) start-ups
3) research centers

Microsoft | QUALCOMM | SAMSUNG ELECTRONICS | SIEMENS

IBM | Google | intel | NEC

NIRENBERG NEUROSCIENCE — Lux Take: Strong Positive

pilot.ai — Lux Take: Positive

Orbital Insight — Lux Take: Positive

OSARO — Lux Take: Positive

AICs Advancing AI Compute — Lux Take: Positive

Preferred Networks — Lux Take: Wait and See

TERADEEP — Lux Take: Wait and See

aidoc — Lux Take: Wait and See

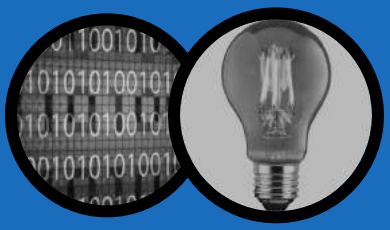
UNIVERSITY OF CALIFORNIA | 清華大學 Tsinghua University | NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE | UNIVERSITY OF TORONTO

HARVARD UNIVERSITY | MIT | STANFORD | 香港中文大學 The Chinese University of Hong Kong

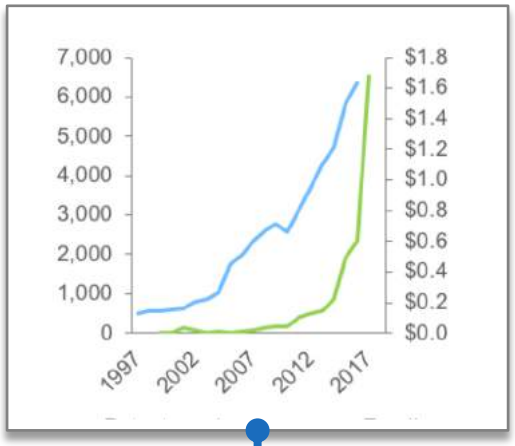
Who?

DATA + INSIGHT FOR WHO TO WORK WITH

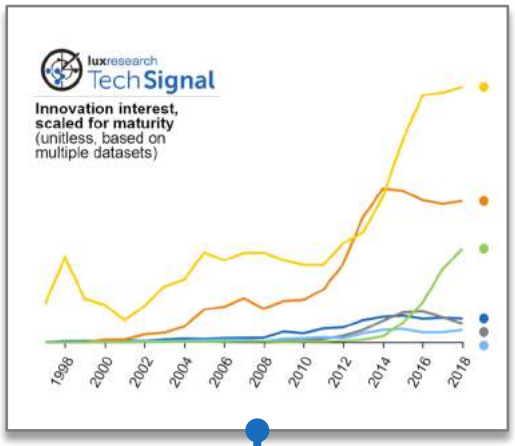
Bolster the data with Insight



PATENTS, PAPERS, FUNDING DATA



LUX TECH SIGNAL LEADING INDICATOR



NEWS & CURRENT EVENTS

SoftBank → nauto

Softbank led a 2017 $159 million Series B investment in Nauto

LUX ANALYST EXPERTISE

COMPANY PROFILE

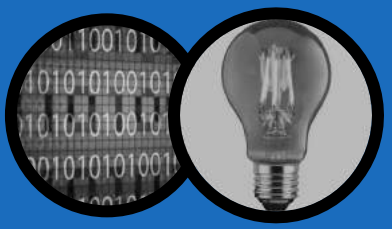
Nauto

Connected hardware for vehicle fleet management

Who?

DATA + INSIGHT FOR WHO TO WORK WITH

Bolster the data with Insight



Nauto Company Profile Summary

Connected hardware for vehicle fleet management

Lux Take *Positive*

TECHNOLOGY AND DIFFERENTIATORS:

- Develops deep learning enabled retrofit dashboard camera system for occupant and environmental monitoring purposes
- Provides fleet managers with reports on individual driver performance as well as scenarios that could affect the entire fleet

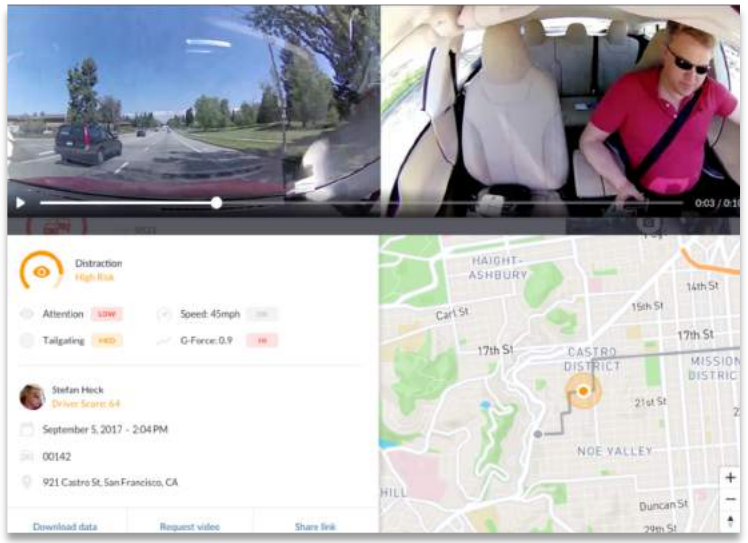
STRATEGY AND MARKETS:

- Sells its cameras at an initial price of $399 and then offers a SaaS model to access Nauto's cloud processing and reporting services

LUX TAKE:

- *Positive* – Pursuing a cloud platform that would focus on autonomous vehicles, instead of connected car services; **Unique solution leverages deep learning for insight in and out of the car**

nauto



Who?

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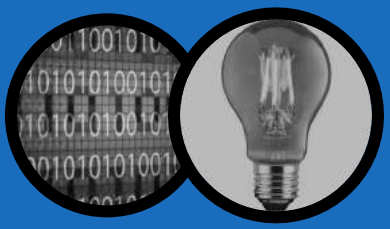
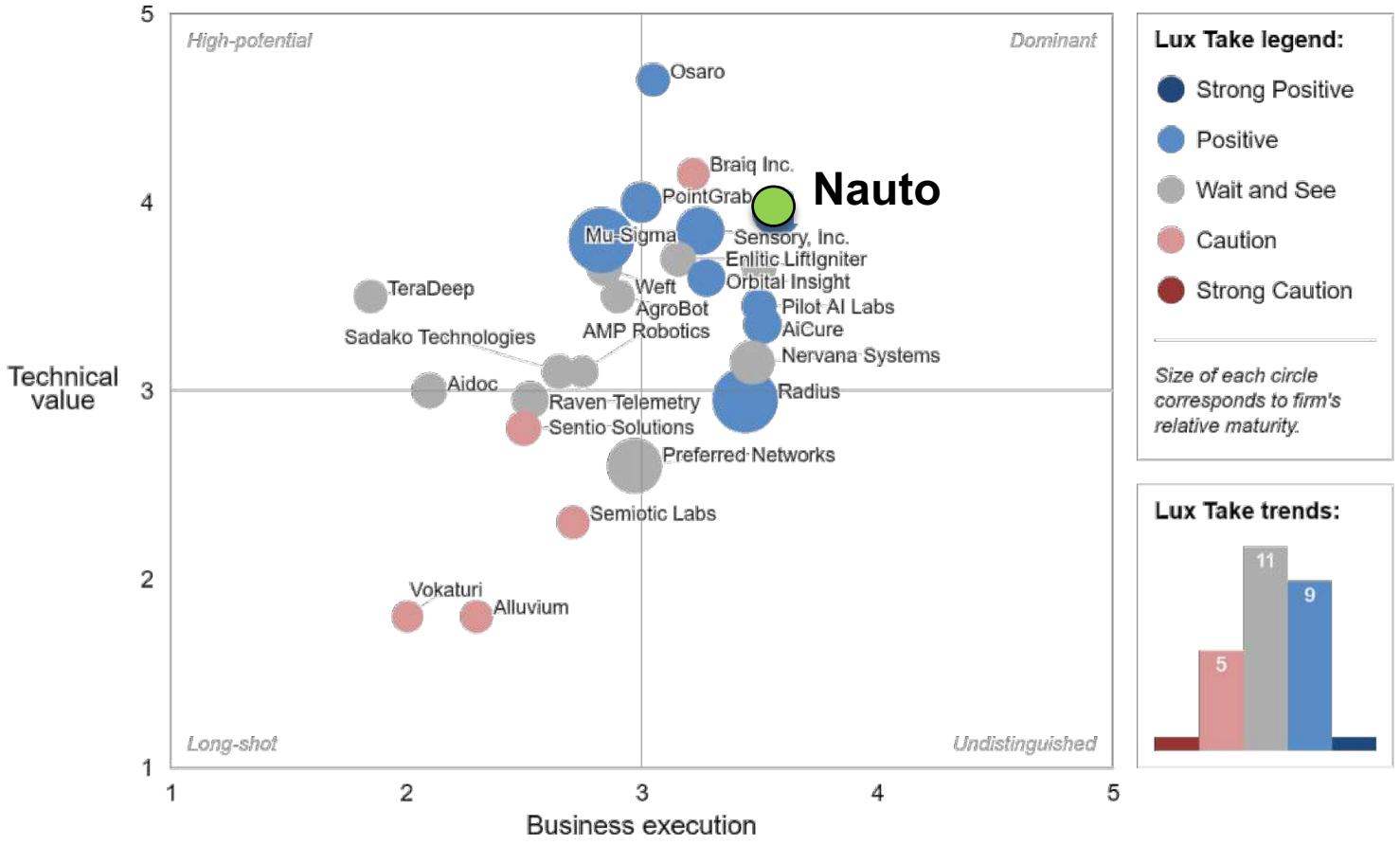


Lux Innovation Grid (LIG) for Deep Learning




When?
TUE
WED
POLICE

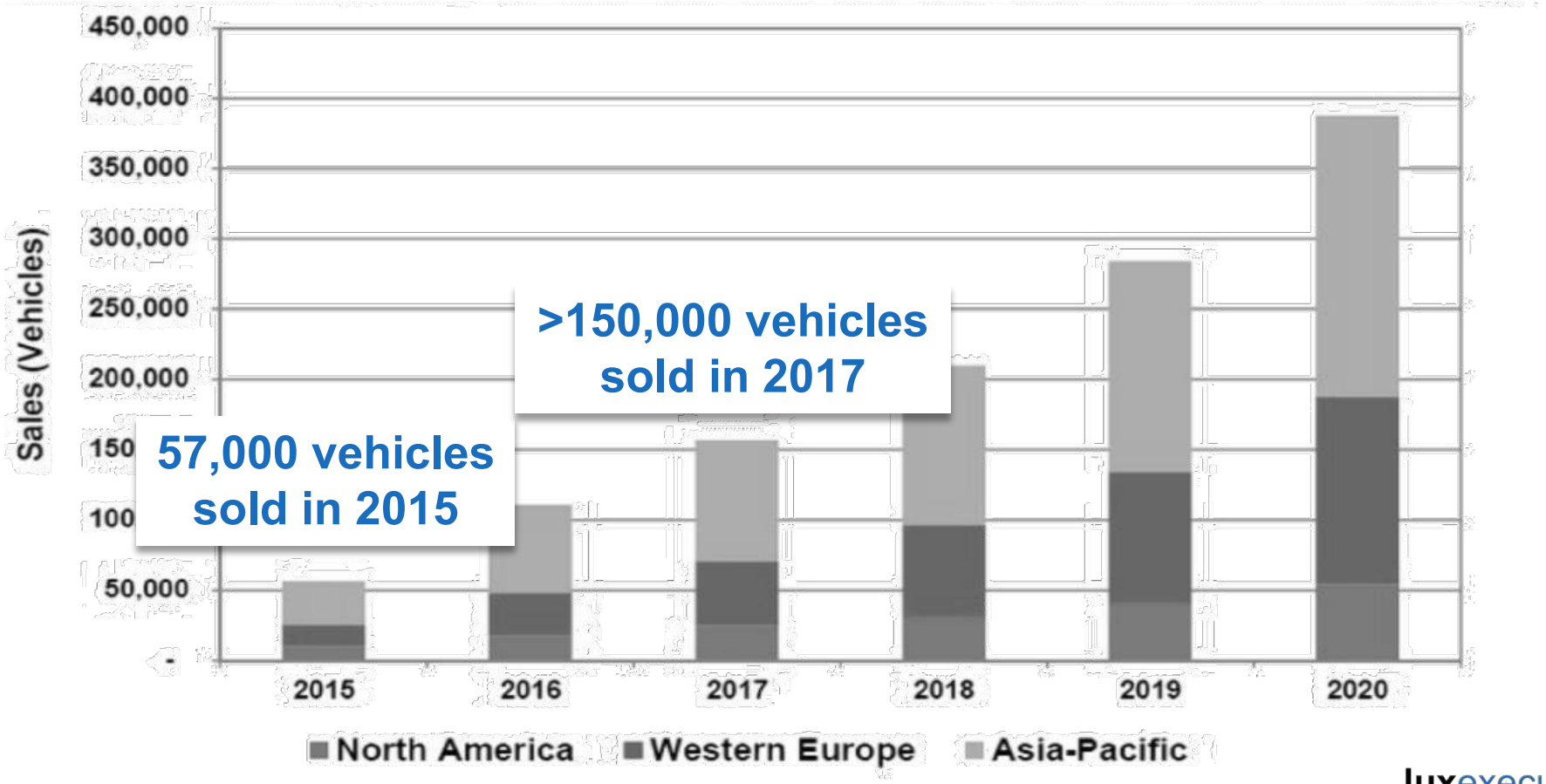
EVs vs. Fuel Cells

When?

TRADITIONAL FORESIGHT

Fuel cell vehicle adoption – what they said in 2011

2011 Forecast



When?

TRADITIONAL FORESIGHT

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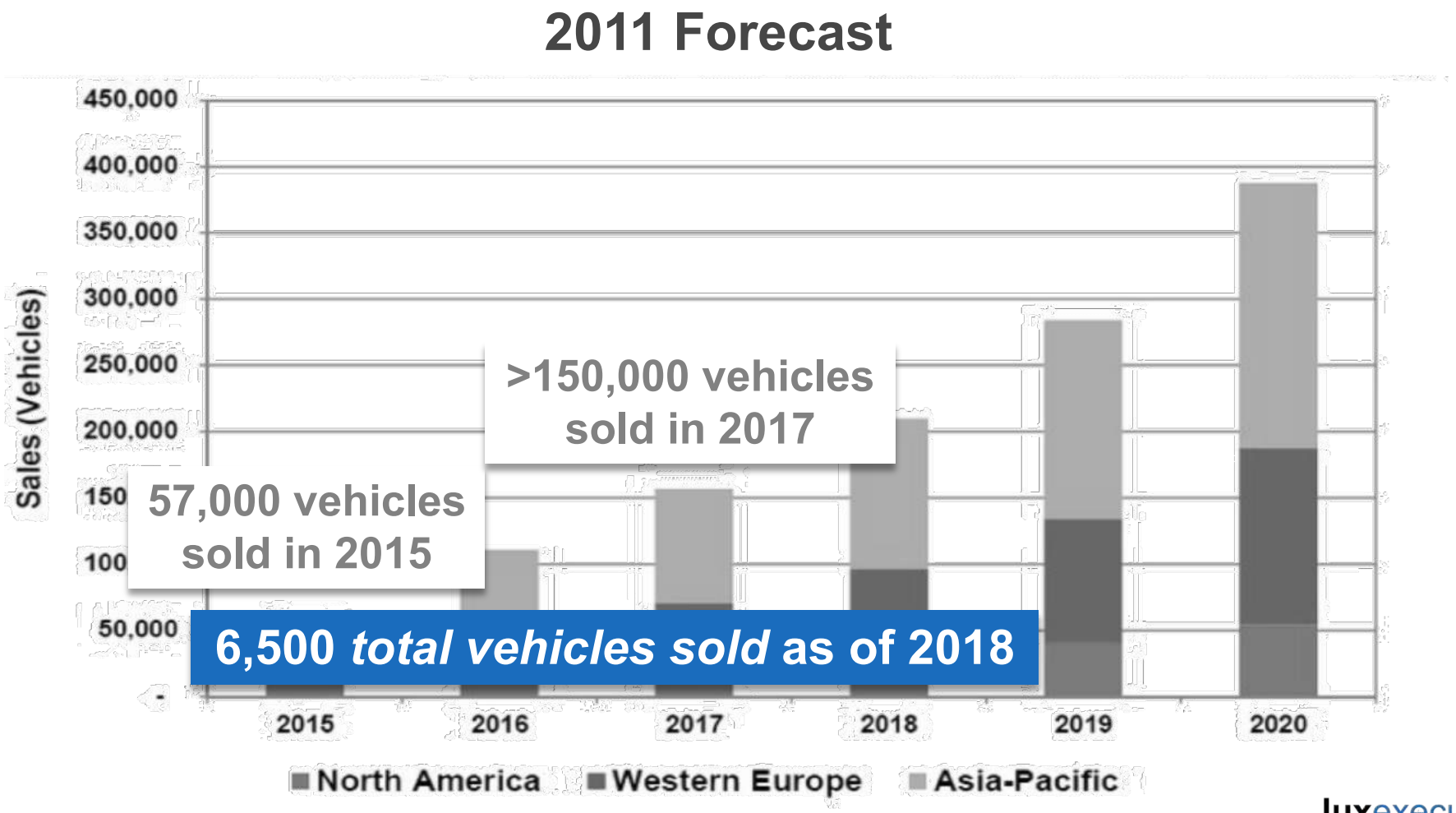
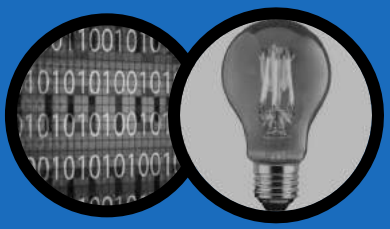


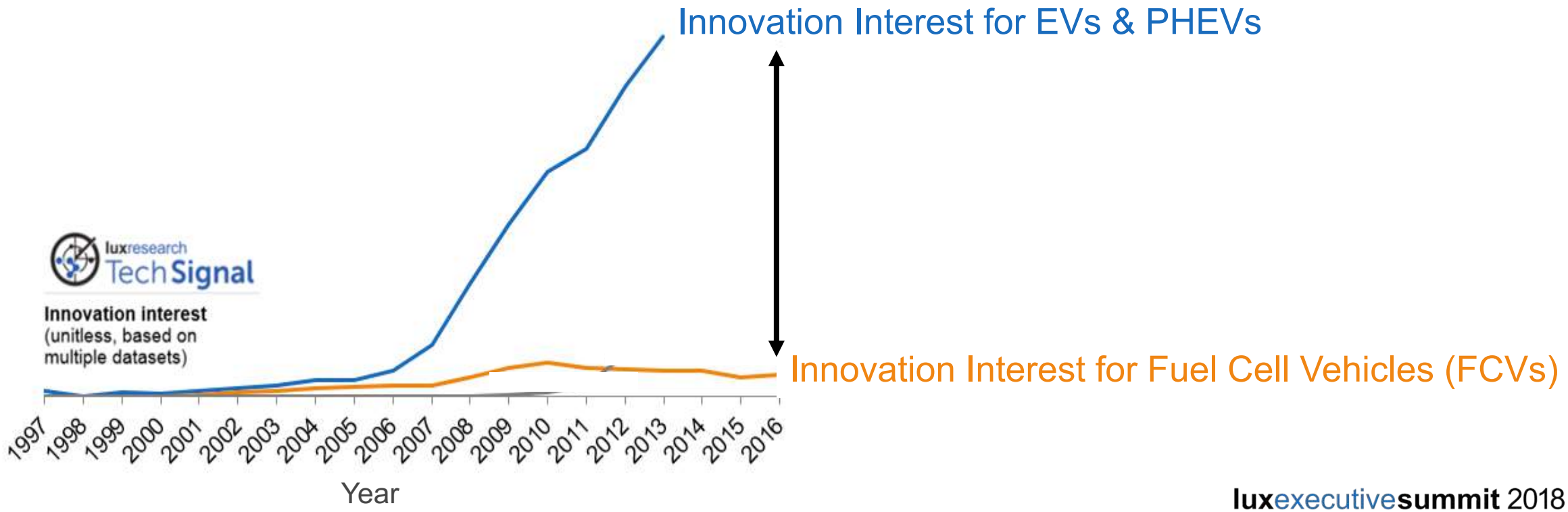
When?

DATA + INSIGHT FOR WHEN TO ACT

The value of leading indicators



How Lux Tech Signal anticipated the rise of plug-in vehicles and failure of fuel cell vehicles



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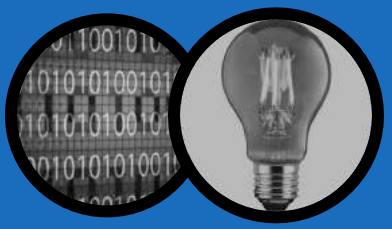
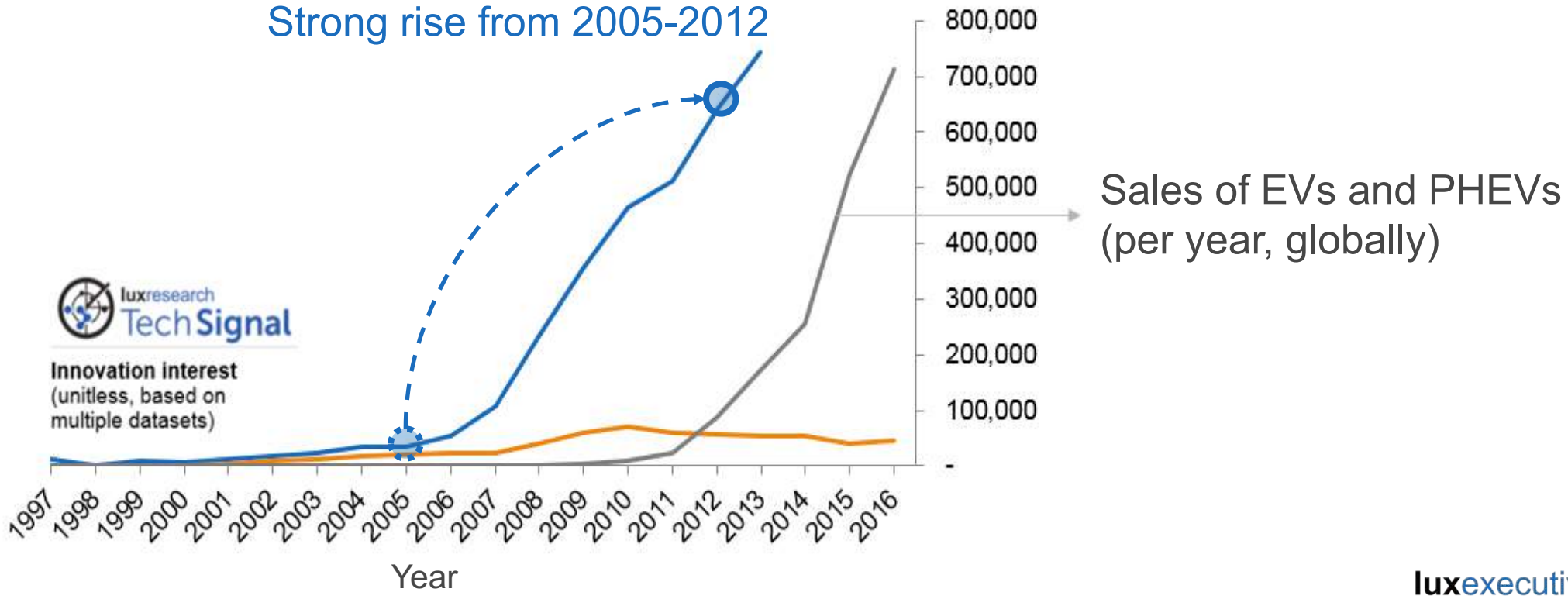


How Lux Tech Signal anticipated the rise of plug-in vehicles and failure of fuel cell vehicles

Innovation Interest for EVs & PHEVs
Strong rise from 2005-2012



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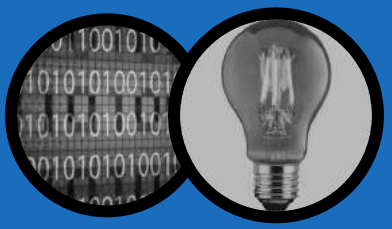

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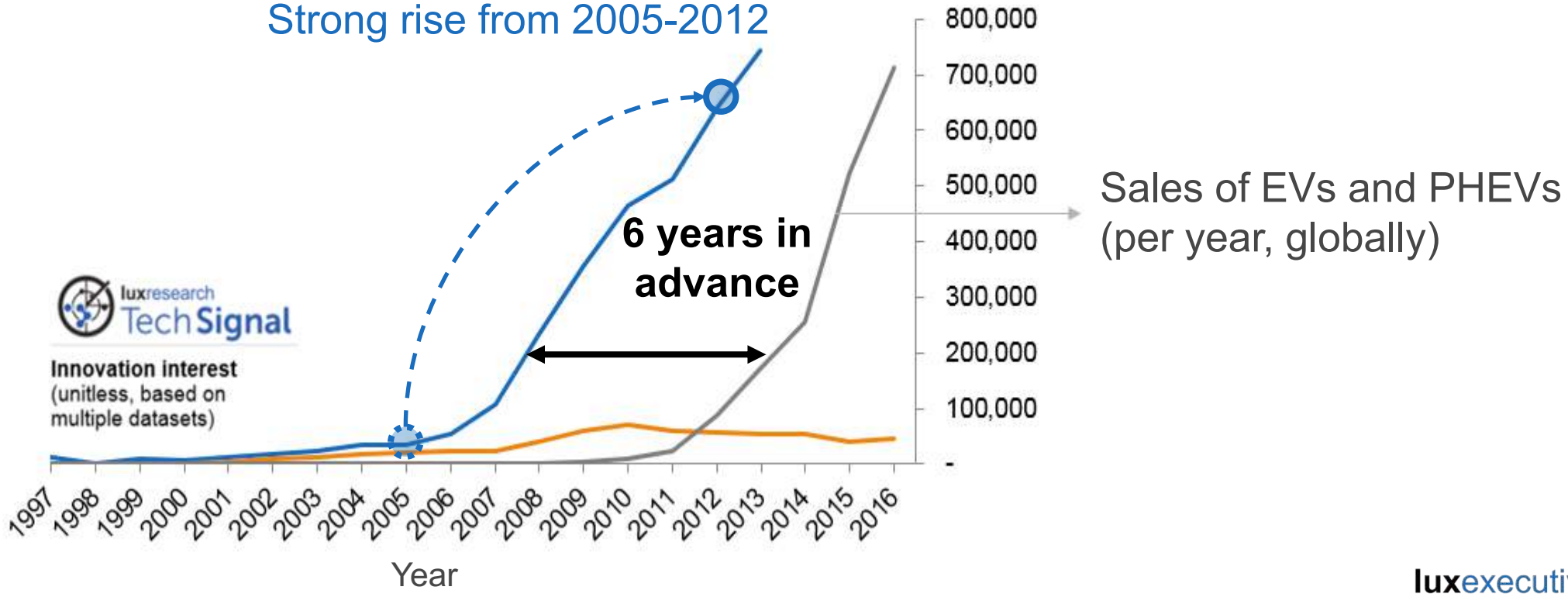

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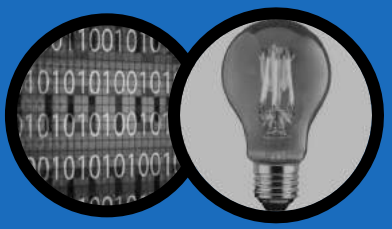

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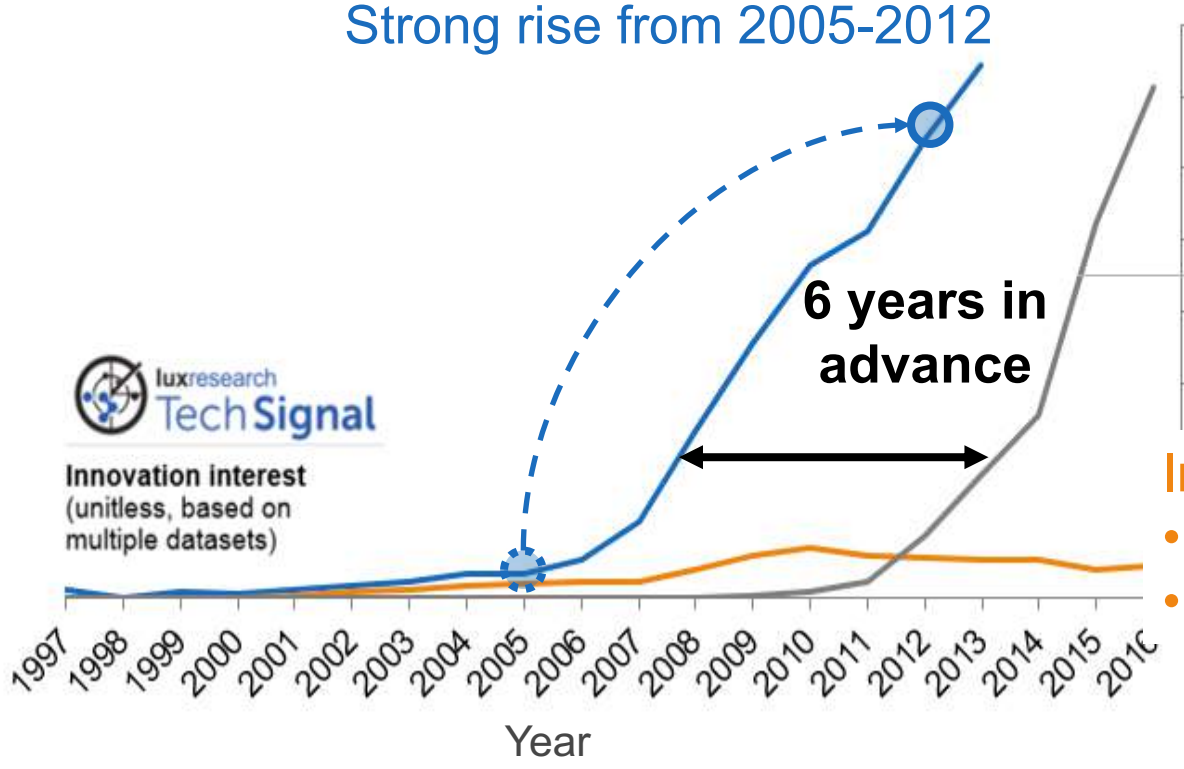
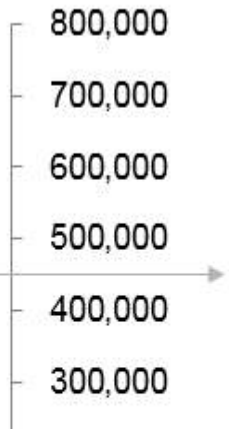




Sales of EVs and PHEVs
(per year, globally)

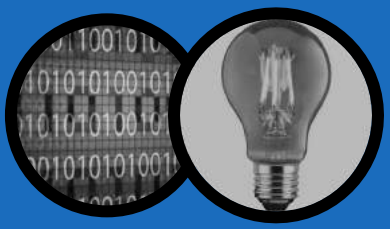
Innovation Interest for Fuel Cell Vehicles (FCVs)

- Remained flat
- Corresponding sales too small to register

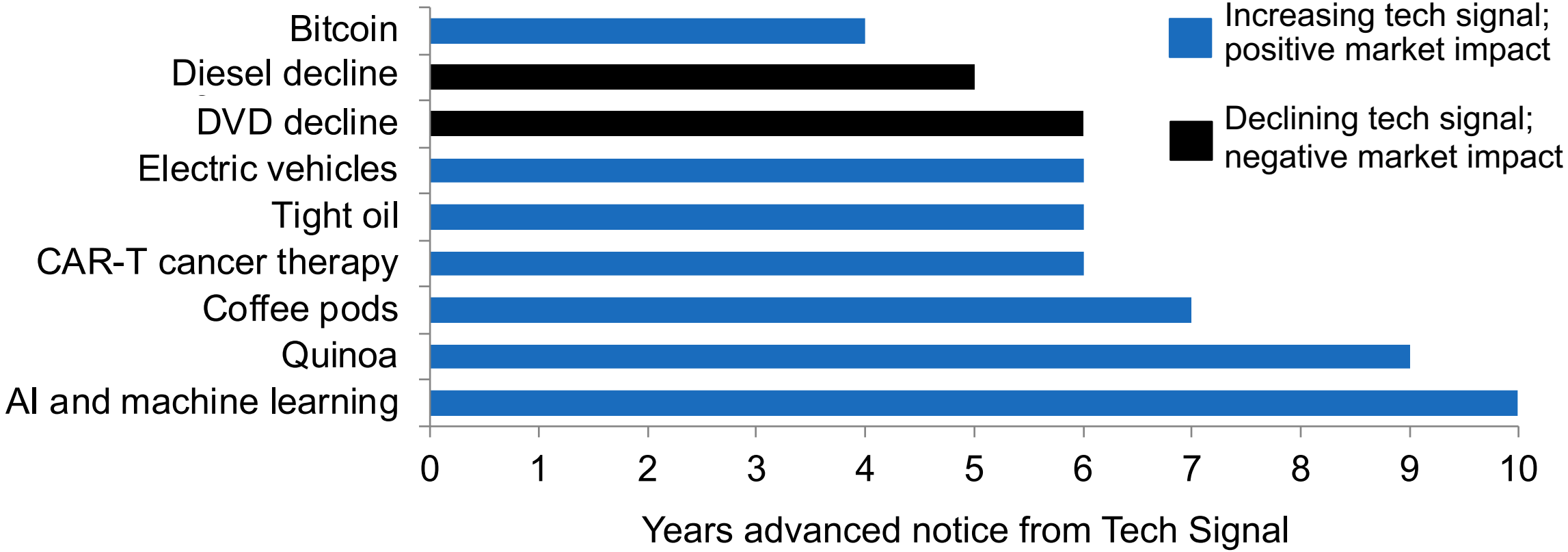
When?

DATA + INSIGHT FOR WHEN TO ACT

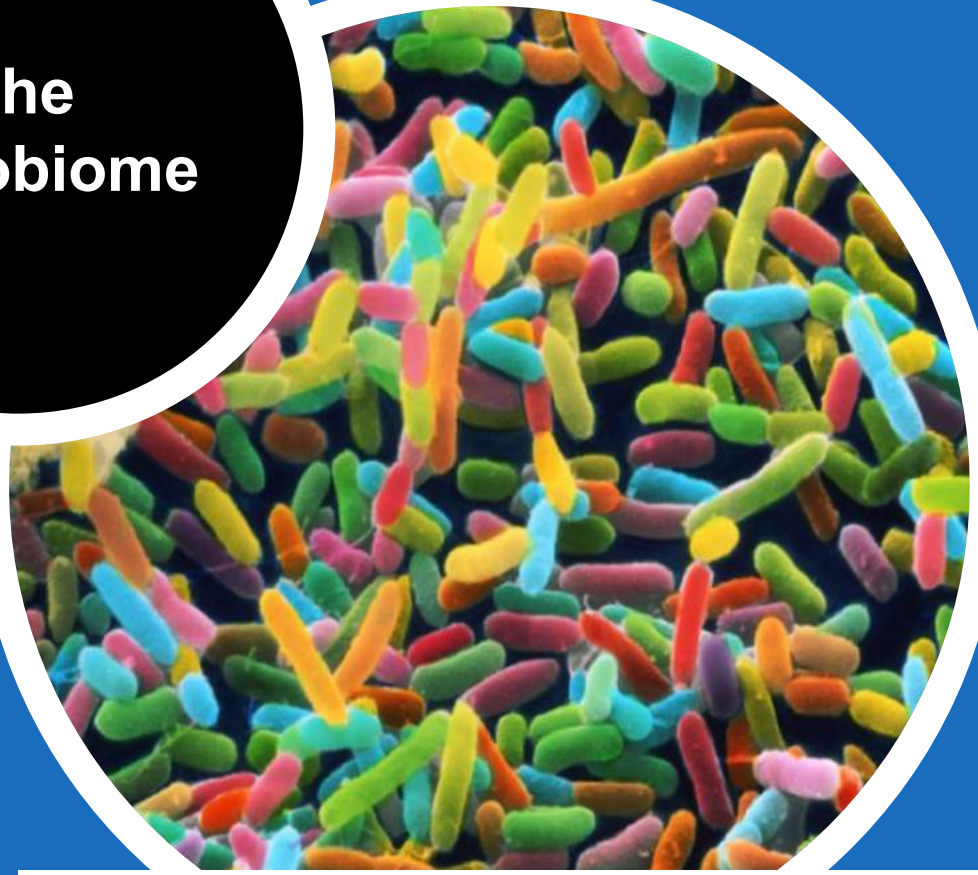
The Lux Tech Signal as a leading indicator



Years advanced notice of technology market impact from Tech Signal



The microbiome

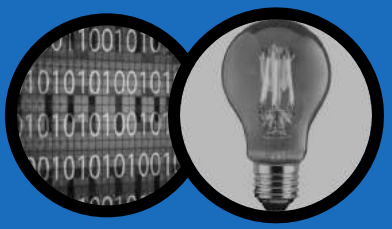


Impacts of microbes in different environments to aid development of ingredients, therapeutics, and diagnostics

What?

DATA + INSIGHT

What technologies should you prioritize?



18 for 2018

Executive Summary: Top technologies Lux is following in 2018, using data from the Lux Intelligence Engine and analysts' insight

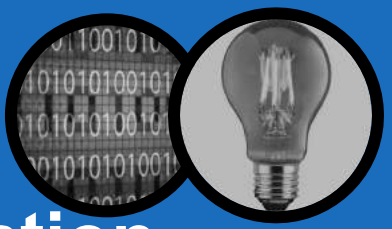
A ranking of the most important technologies to watch, given their potential to transform the world in the next decade

1. **Machine Learning and Deep Neural Networks**
   30% annual increase in machine learning patents
2. **3D Printing and Additive Manufacturing**
   Lux expects 3D printing to be a $20 billion market by 2025
3. **Genome Editing**
   $1.2 billion in VC funding to impact industries from food to health care
4. **5G Networks**
   Over 70,000 patents set the stage for 5G network launches in 2018
5. **Microbiome**
   Harnessing the power of microbes for nutrition, agriculture, and more
6. **Solid-state Batteries**
   Safer and better batteries, pursued by start-ups and giants like Toyota
7. **Synthetic Biology**
   A recent $275 million round for Ginkgo Bioworks highlights the potential
8. **Augmented Reality (AR)**
   Enterprise applications are coming now, on heels of $4.4 billion in funding
9. **Smartwatches**
   Patents soar from near zero to over 23,000 in less than five years
10. **Wireless Charging**
    Here now for consumer electronics, with R&D pushing for EV uses
11. **Materials Informatics**
    Using IT and AI to break out of slow material development cycles
12. **IoT Security**
    Patents are up 13x as connected devices proliferate
13. **Edge Computing**
    When milliseconds matter, analytics can be local, not in the cloud
14. **Energy Distribution System Monitoring**
    Growing demand and renewables require tech to balance the grid
15. **Polyethylene Furanoate (PEF)**
    Innovation has grown at an 87% annual rate to improve on PET
16. **Sugar Reduction**
    Over 162,000 patents to combat health ills from too much sugar
17. **Neural Interfaces**
    Tech to read and stimulate the brain will see growing validation in 2018
18. **Syngas and Power-to-Gas**
    Producing fuels from CO_2 to drive the energy transition

What?

DATA + INSIGHT

The microbiome is the holy grail of personalization



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DATA + INSIGHT

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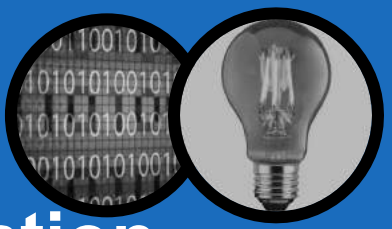
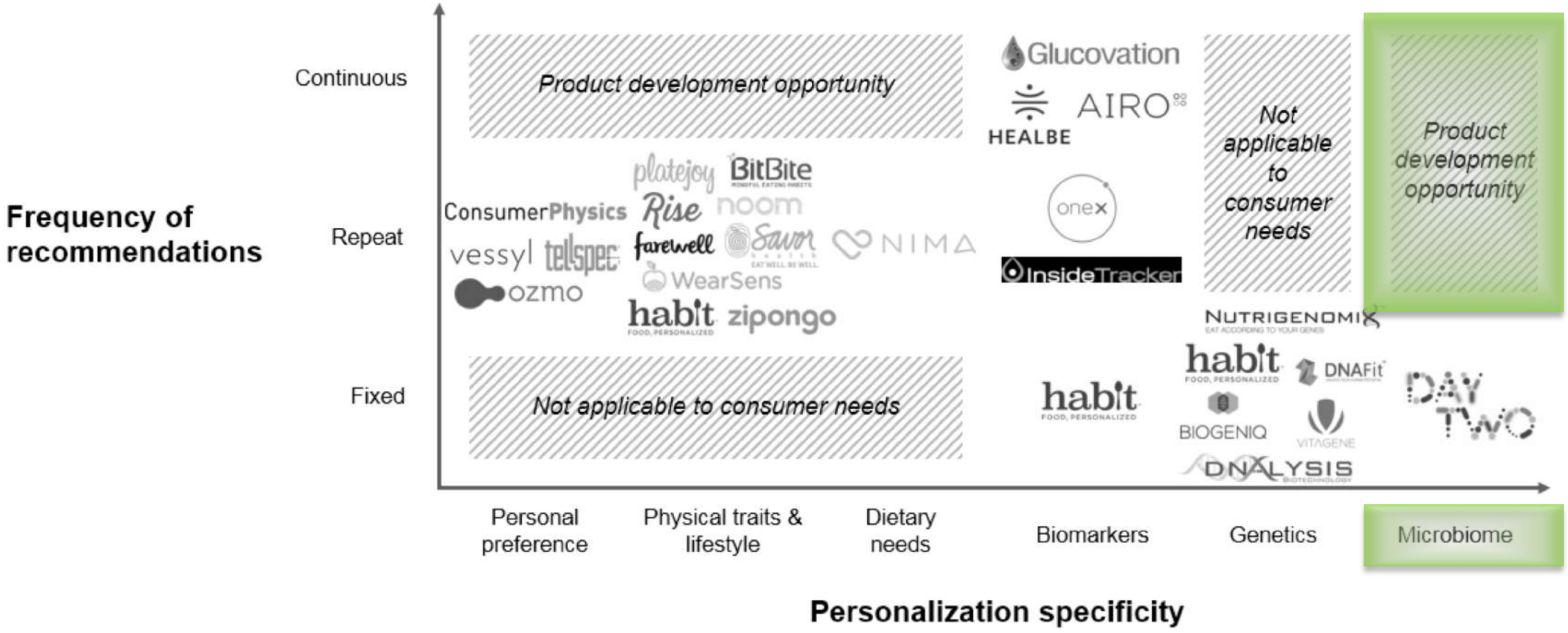
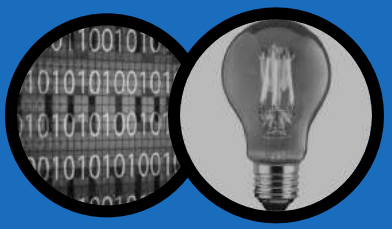




Who?

DATA + INSIGHT

Development of ingestible sensors capable of measuring gases in the gut



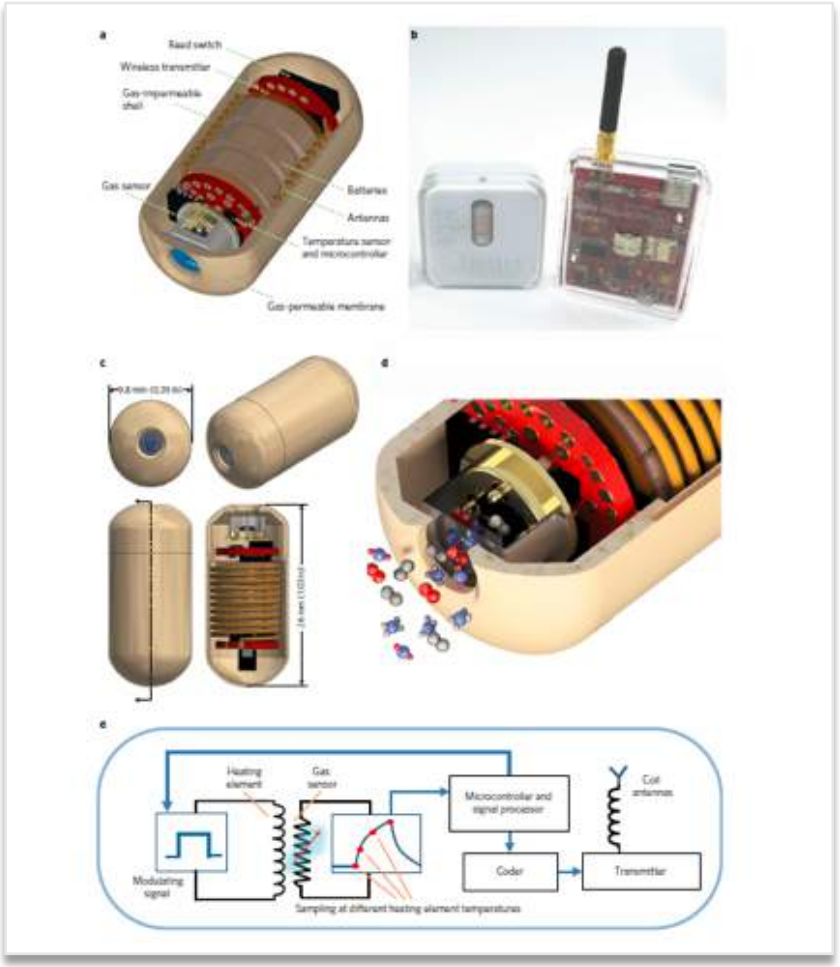
RMIT is **developing an ingestible sensor to measure gases (oxygen, hydrogen, carbon dioxide) in the gut and recently conducted a human pilot trial**

Version 2: add hydrogen sulfide sensing

Version 3: add short-chain fatty acids

Looks to include analytics to convert raw data to actionable insight.

Unique in providing localized, high frequency measurements of the microbiome.



RMIT UNIVERSITY

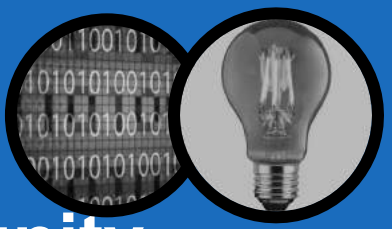
atmo BIOSCIENCES™

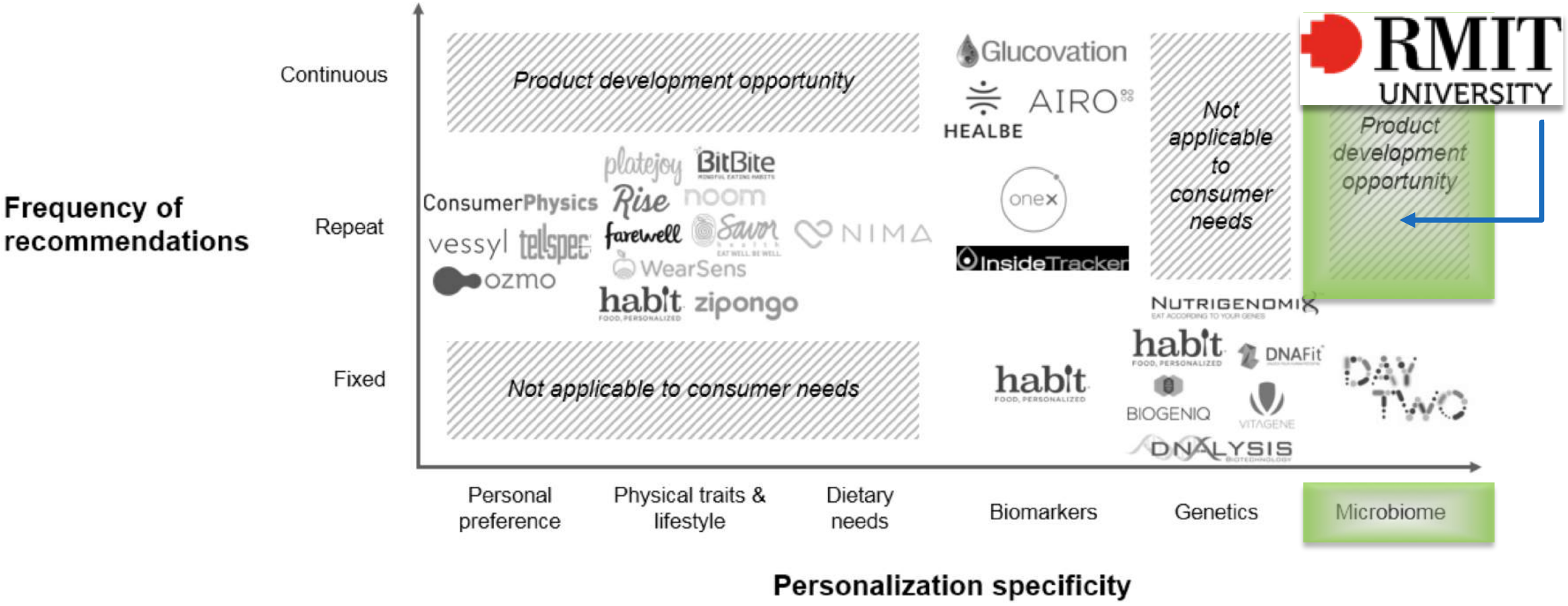
See Lux's "An expert weighs in: Microbiome analysis methods and developers"

Who?

DATA + INSIGHT

Ingestible gas sensor plays into a previously-open product development opportunity

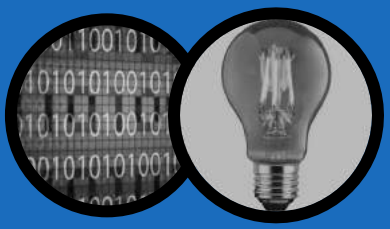




When?

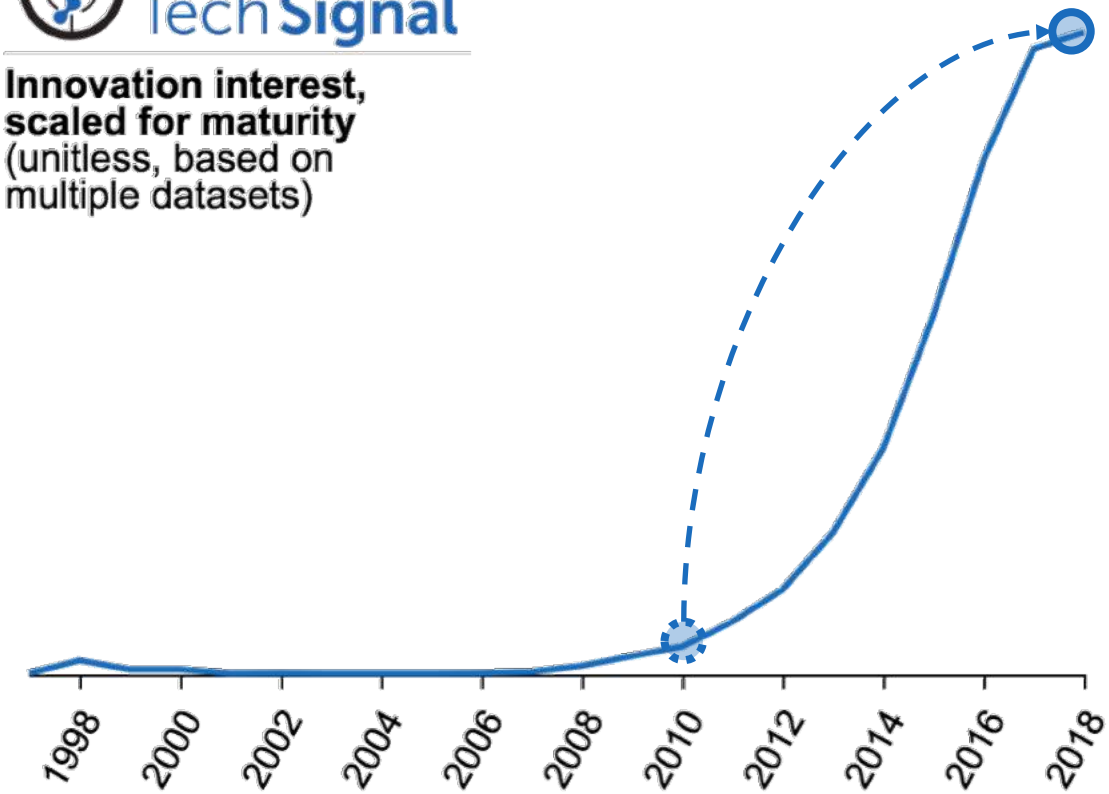
DATA + INSIGHT FOR WHEN TO ACT

Microbiome innovation is rising fast



luxresearch TechSignal

Innovation interest, scaled for maturity (unitless, based on multiple datasets)

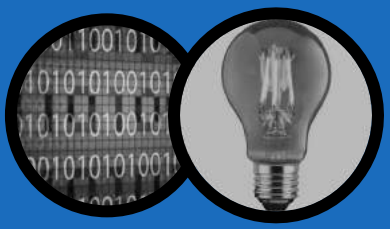


Microbiome innovation interest

When?

DATA + INSIGHT FOR WHEN TO ACT

Making a call – predicting market impact



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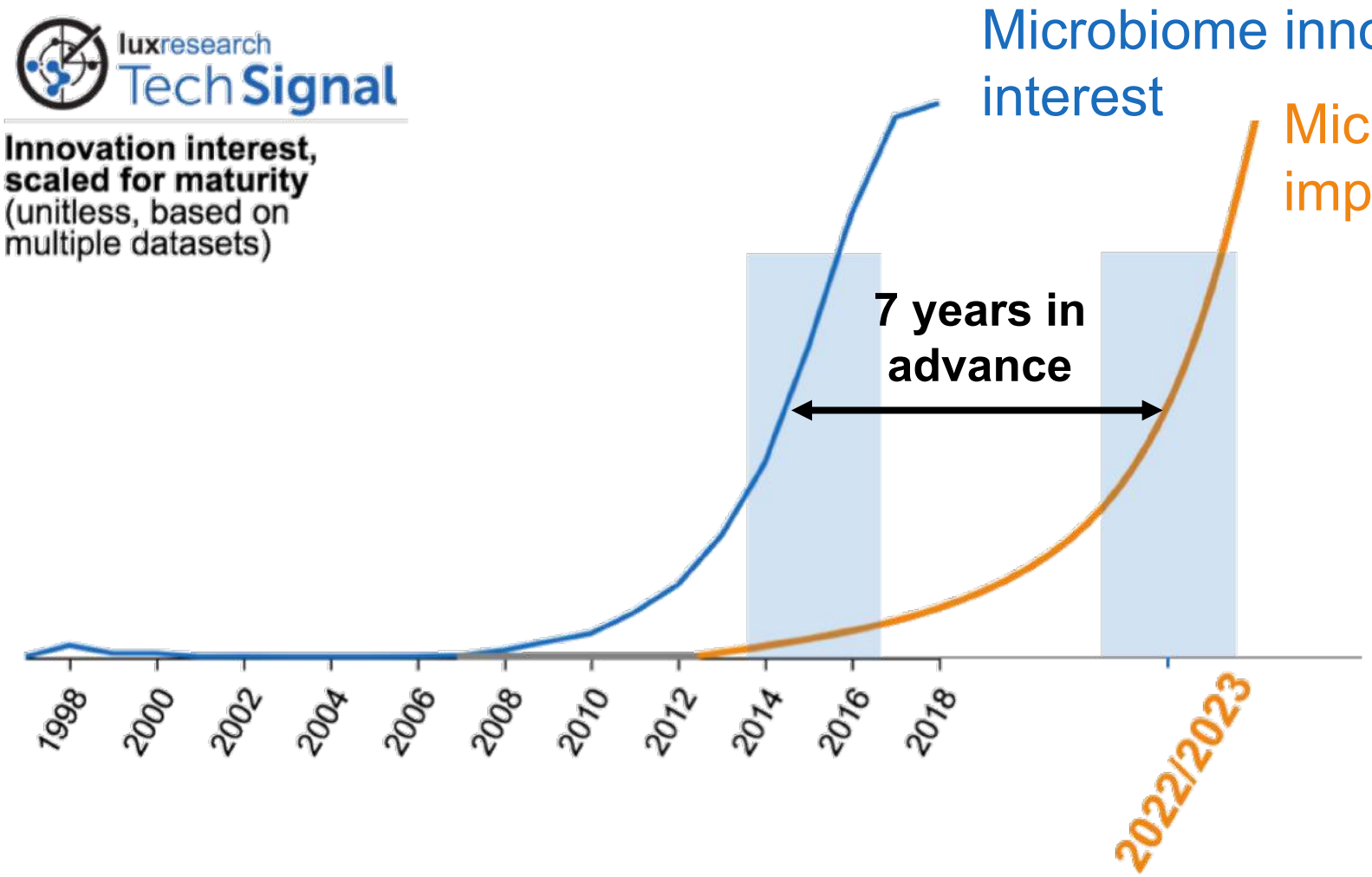


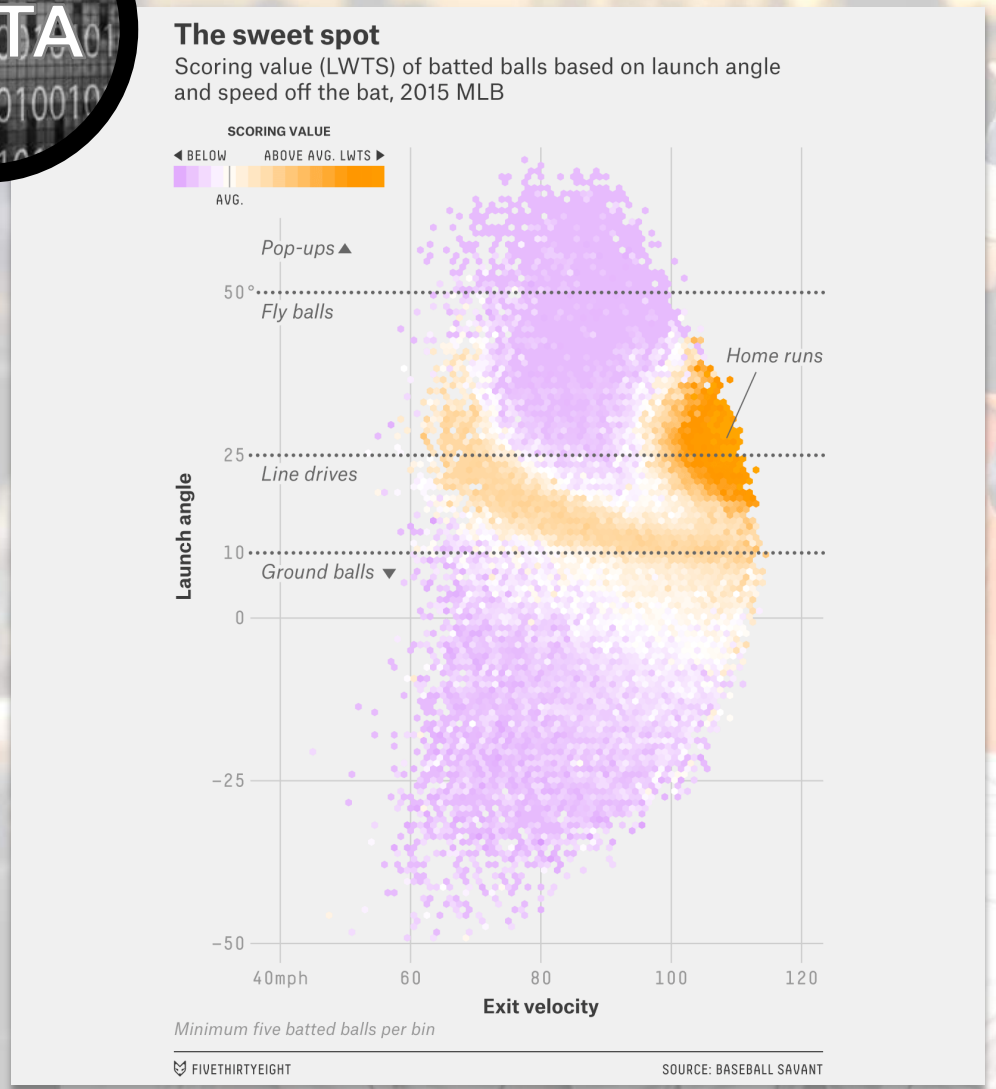
Agenda

1 | The stagnation of the Innovation Process

2 | Data + Insight to get at What, Who, and When

3 | **Evolving for better results**

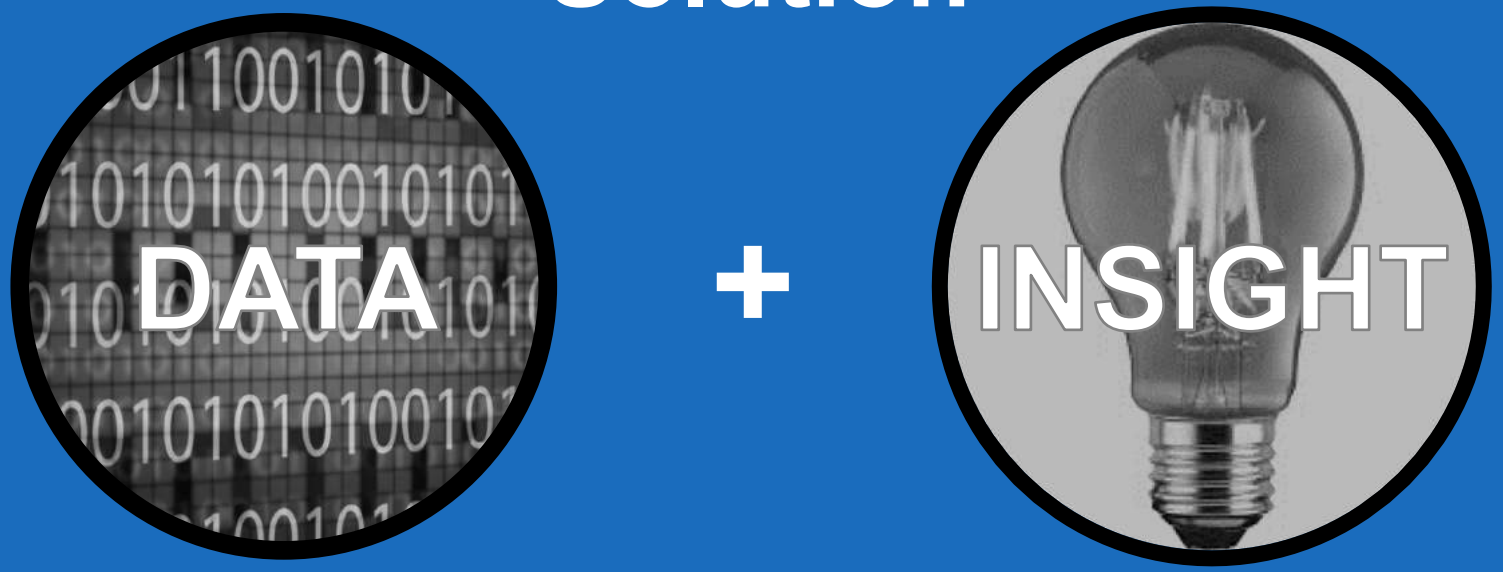

WORLD SERIES CHAMPIONS
BELTRA
15



Year	Team	League	Wins	Losses	%
2017	Houston Astros	American League	101	61	.623
2016	Houston Astros	American League	84	78	.519
2015	Houston Astros	American League	86	76	.531
2014	Houston Astros	American League	70	92	.432
2013	Houston Astros	American League	51	111	.315
2012	Houston Astros	National League	55	107	.340

“…A few years of struggle could lead to many years of success.”

Solution



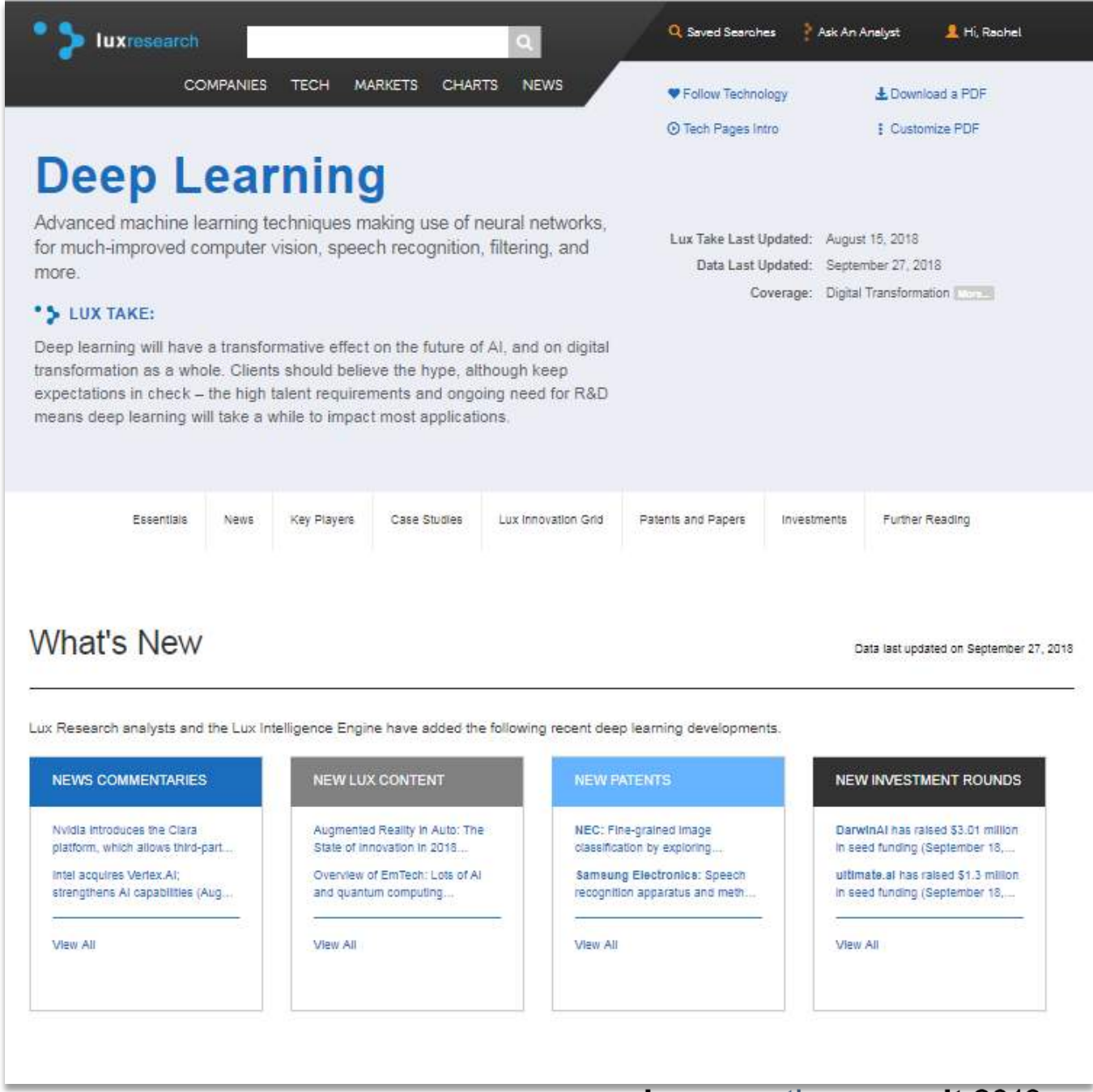
Now available…

Tech Pages

Tech Pages

DISCOVER | LEARN | STAY UP-TO-DATE

A trusted, single destination for data and insights about the most important technology innovations, curated and analyzed by Lux Analysts.



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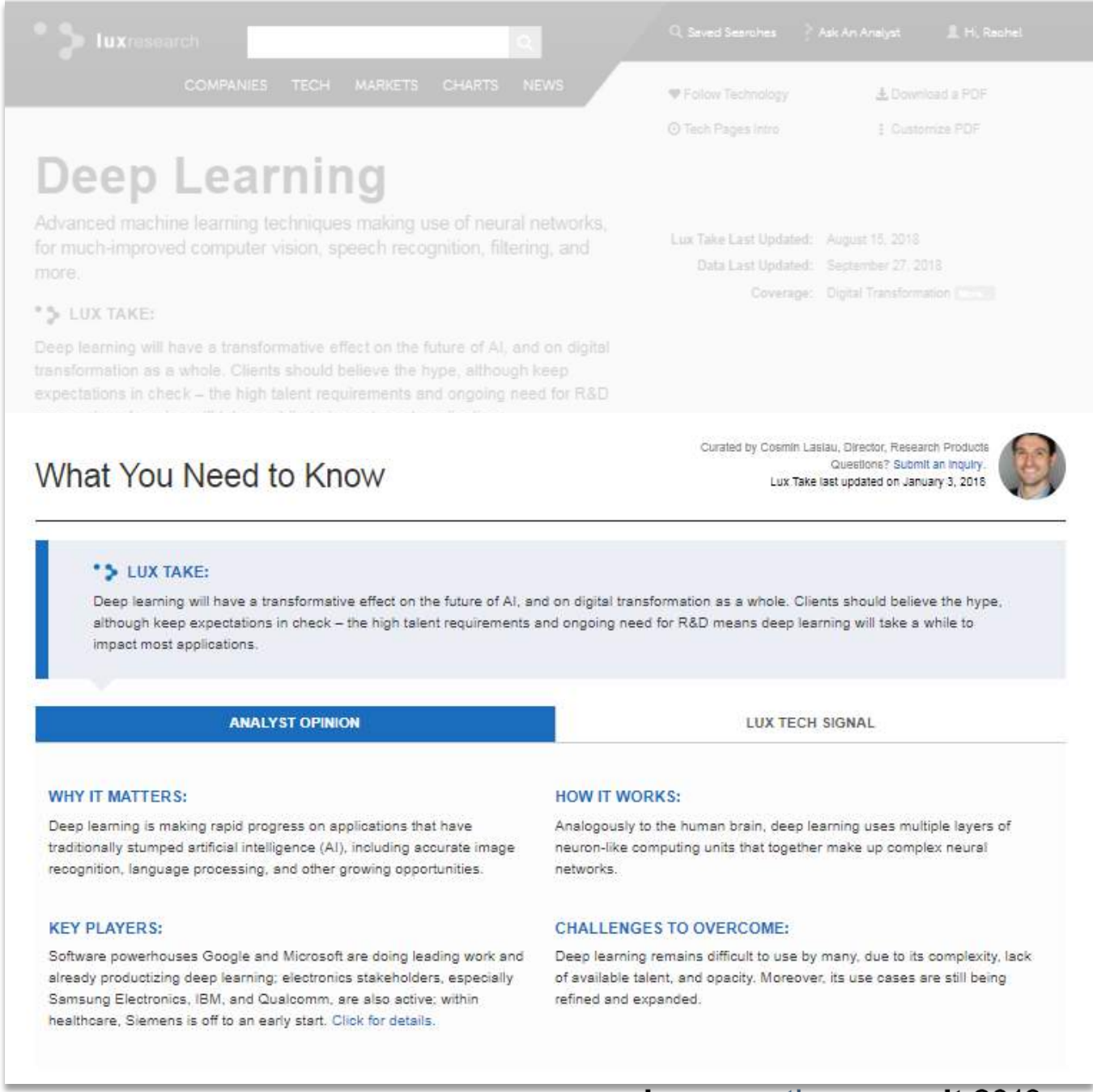
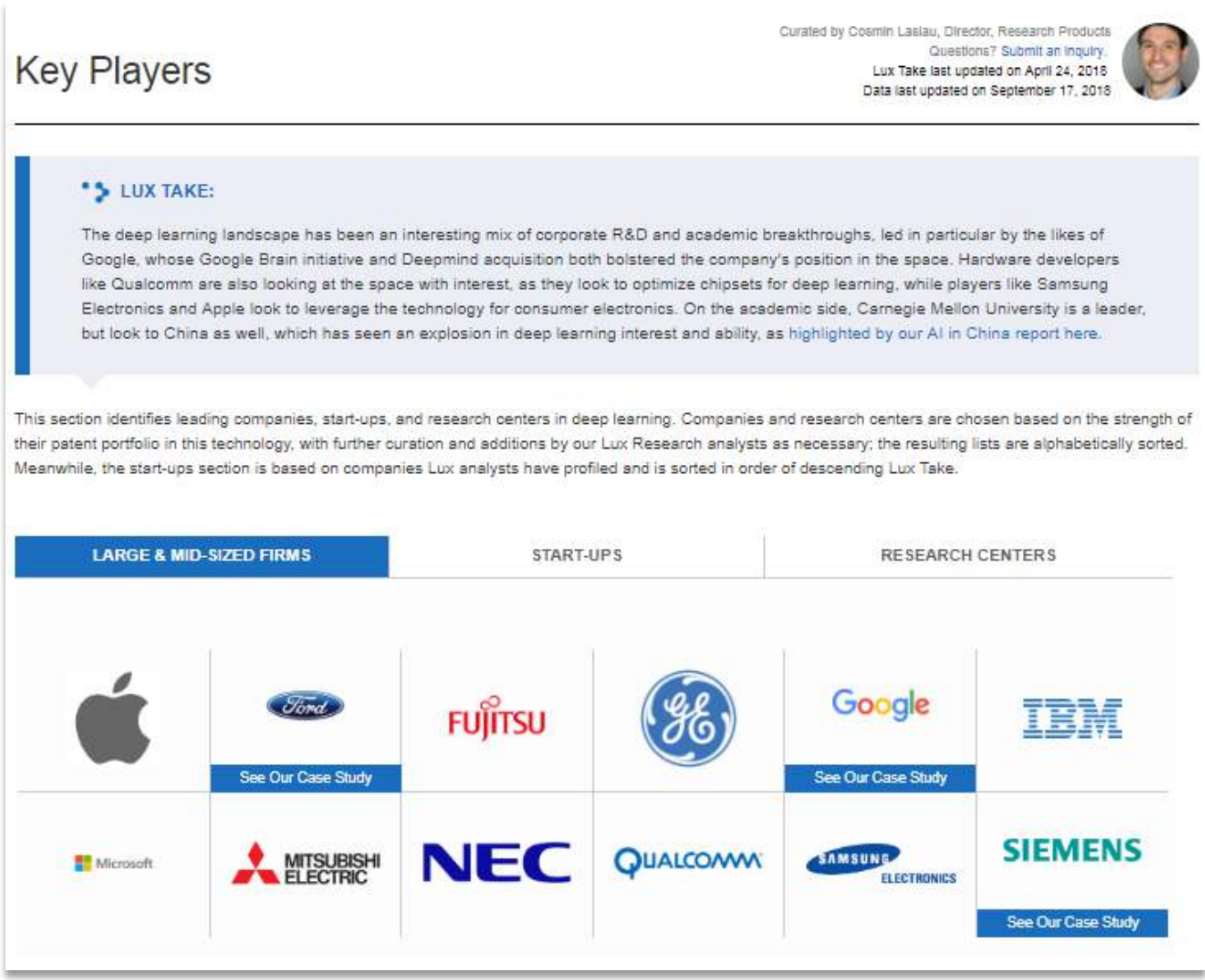


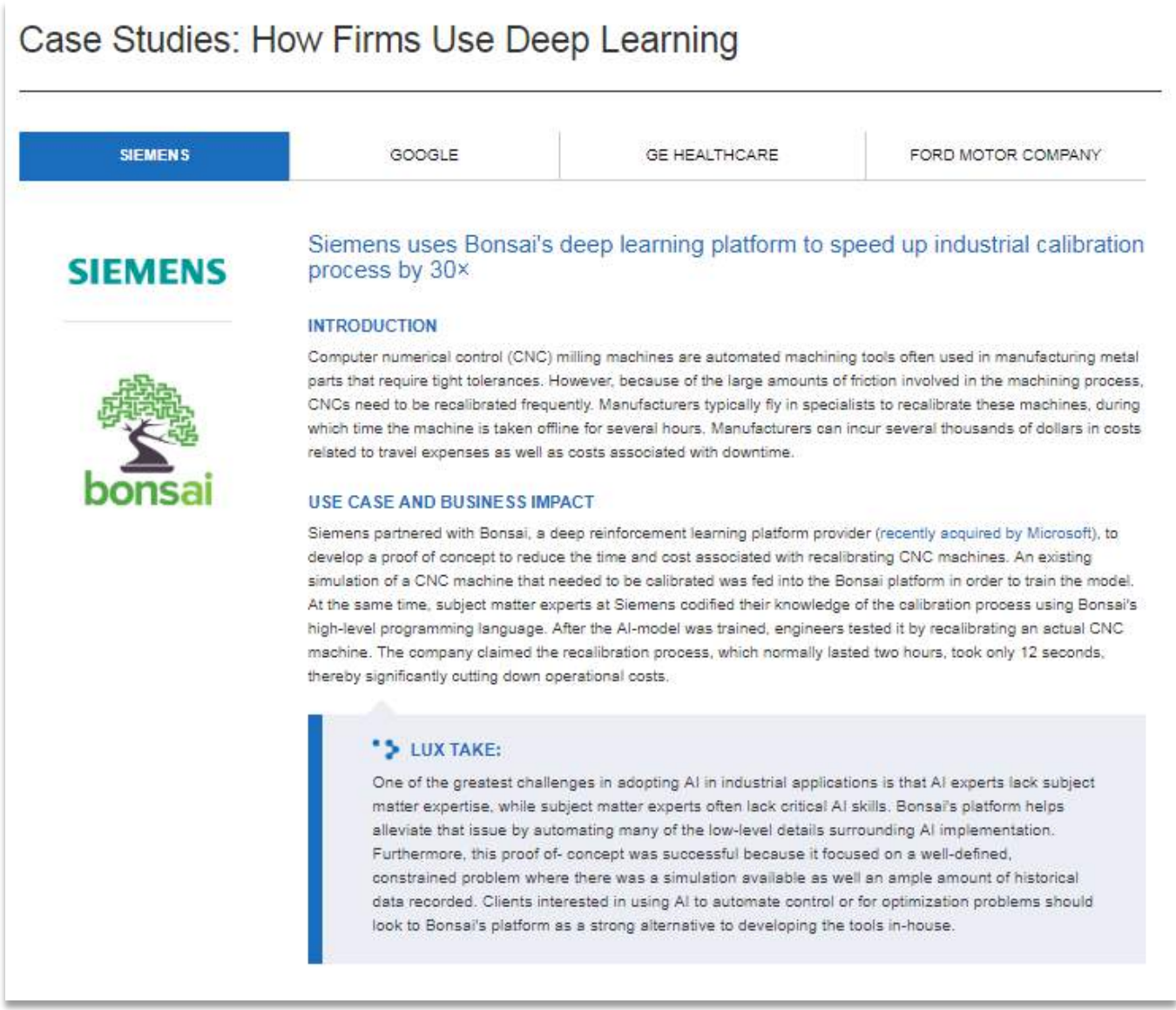
Tech Pages

Understand the landscape of key players, including start-ups, large and mid-sized firms, and research centers…



Tech Pages

…along with case studies about successful deployments



Case Studies: How Firms Use Deep Learning

SIEMENS | GOOGLE | GE HEALTHCARE | FORD MOTOR COMPANY

SIEMENS

bonsai

Siemens uses Bonsai's deep learning platform to speed up industrial calibration process by 30×

INTRODUCTION

Computer numerical control (CNC) milling machines are automated machining tools often used in manufacturing metal parts that require tight tolerances. However, because of the large amounts of friction involved in the machining process, CNCs need to be recalibrated frequently. Manufacturers typically fly in specialists to recalibrate these machines, during which time the machine is taken offline for several hours. Manufacturers can incur several thousands of dollars in costs related to travel expenses as well as costs associated with downtime.

USE CASE AND BUSINESS IMPACT

Siemens partnered with Bonsai, a deep reinforcement learning platform provider (recently acquired by Microsoft), to develop a proof of concept to reduce the time and cost associated with recalibrating CNC machines. An existing simulation of a CNC machine that needed to be calibrated was fed into the Bonsai platform in order to train the model. At the same time, subject matter experts at Siemens codified their knowledge of the calibration process using Bonsai's high-level programming language. After the AI-model was trained, engineers tested it by recalibrating an actual CNC machine. The company claimed the recalibration process, which normally lasted two hours, took only 12 seconds, thereby significantly cutting down operational costs.

LUX TAKE:

One of the greatest challenges in adopting AI in industrial applications is that AI experts lack subject matter expertise, while subject matter experts often lack critical AI skills. Bonsai's platform helps alleviate that issue by automating many of the low-level details surrounding AI implementation. Furthermore, this proof of- concept was successful because it focused on a well-defined, constrained problem where there was a simulation available as well an ample amount of historical data recorded. Clients interested in using AI to automate control or for optimization problems should look to Bonsai's platform as a strong alternative to developing the tools in-house.

Tech Pages

Track trends and updates in key innovation areas like:

- Patents and academic papers

Tech Pages

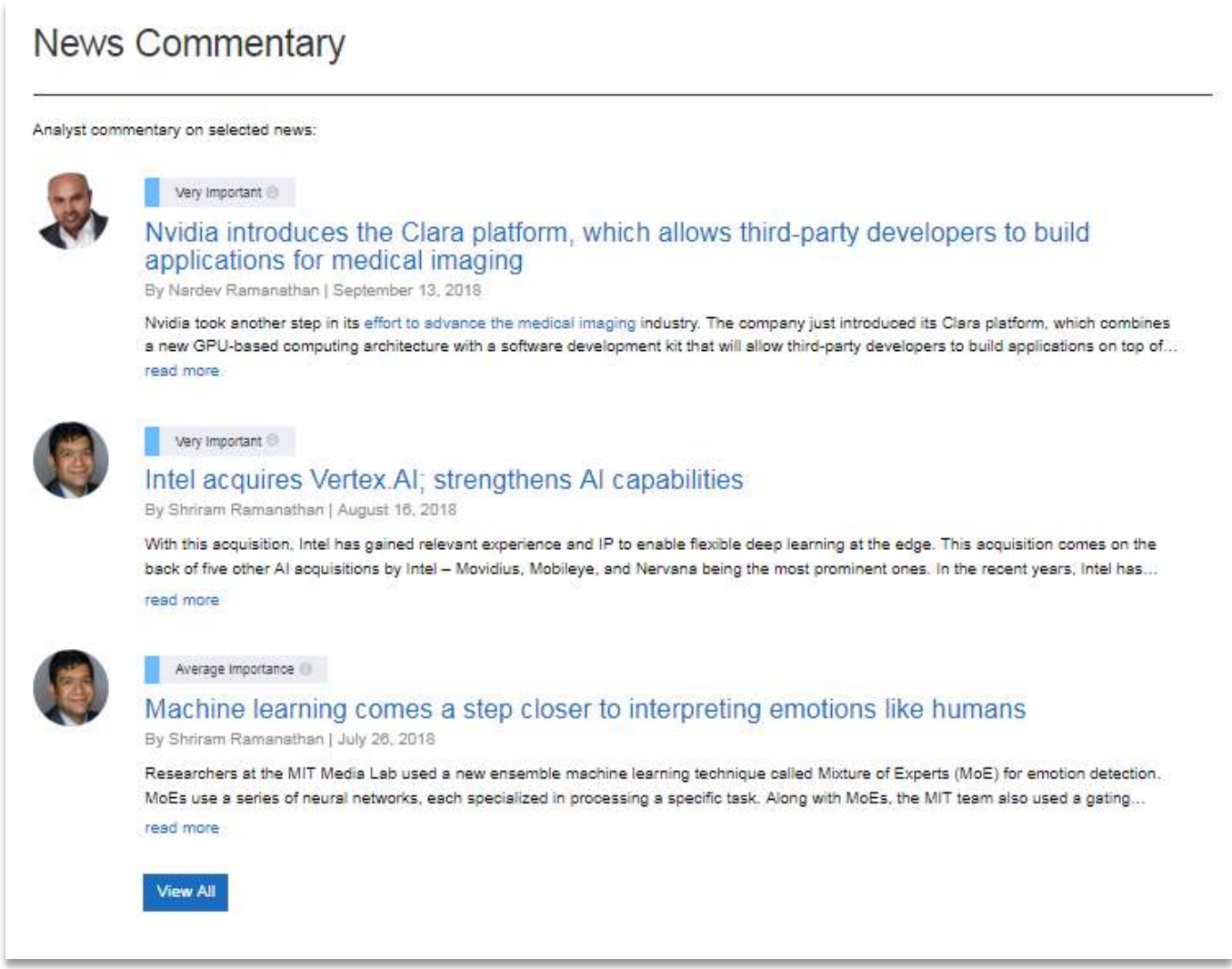
Track trends and updates in key innovation areas like:

- Patents and academic papers
- Investment trends

Tech Pages

Track trends and updates in key innovation areas like:

- Patents and academic papers
- Investment trends
- News commentary
- …and more




3D scanning
Biojet fuel
Photocatalytic coatings
Blockchain
Petroleum drilling
Solid-state batteries
CO_2 Capture
Connected cars
Algae
Flow batteries
Carbon fiber composites
Membrane bioreactors
Microbiome
Genome editing
Perovskite solar cells
Augmented reality
IoT security
Artificial lift
Autonomous vehicles
3D printing
Deep learning
Lidar
Edge computing
Sugar reduction
Predictive maintenance
Commercial drones
Heat pumps
Smartwatches
Cellulosic ethanol
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LPWAN
Bio-based polymers
Hydrophobic coatings
Computer vision
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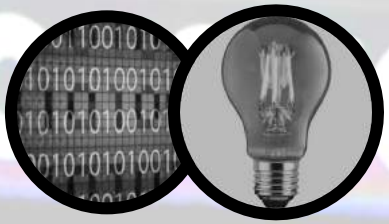
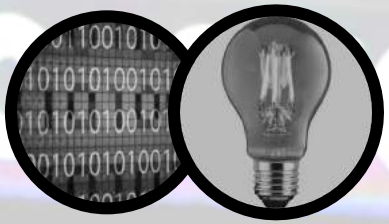
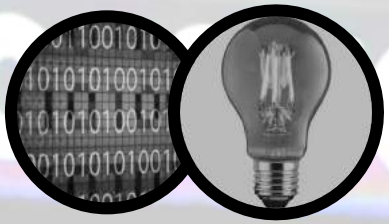
Innovating the innovation process





Innovating the innovation process

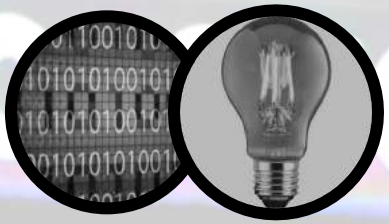
We need more and bigger wins



Innovating the innovation process

We need more and bigger wins

Data is your friend; it does *not* displace expertise and insight



Innovating the innovation process

We need more and bigger wins

Data is your friend; it does *not* displace expertise and insight

Equip your team with the best tools; train them to think systematically and back up intuition with data

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Thank you for joining us.

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