

# SVB Analytics Asia Tour 2015 SSVB Frontier Technology Forum —Big Data & AI Forum



*Steve Allan, SVB Analytics*

Dec 18, 2015

# “World Drowning in Oceans of Data”

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October 31, 2003, *BBC News*

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Digital Universe Doubling Every 18  
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90% of World's Data Generated Over Last Two  
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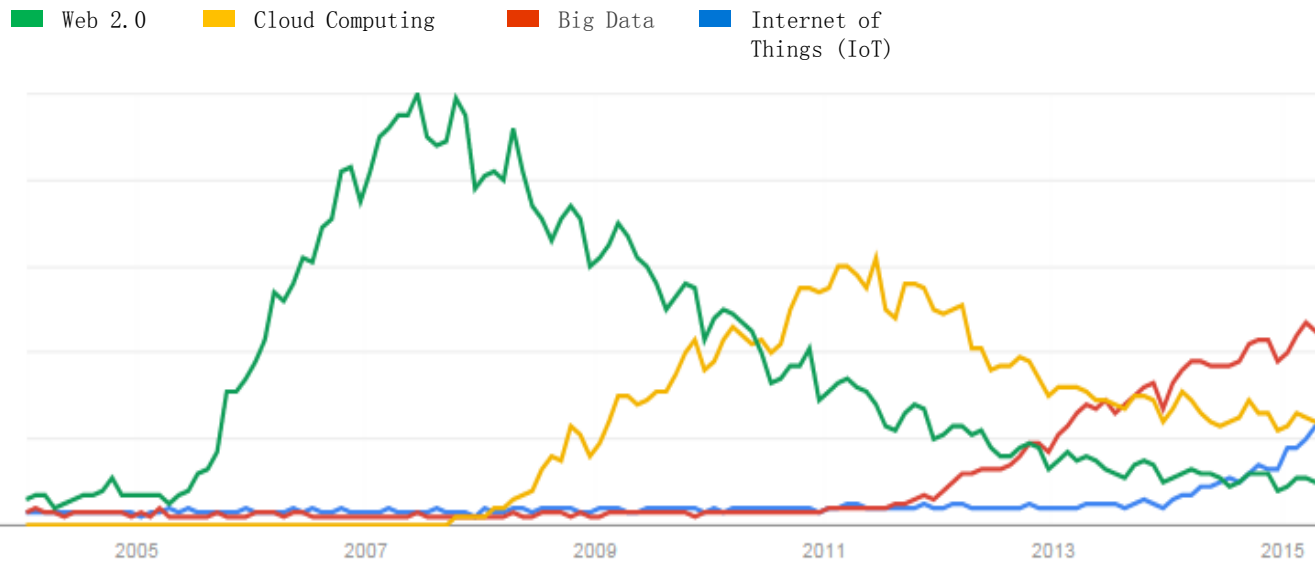
May 22, 2013, **ScienceDaily**

One-Fifth of Organizations Store More Than 1  
Petabyte of Data

February 13, 2015, **CIO**

# The Hype is Real

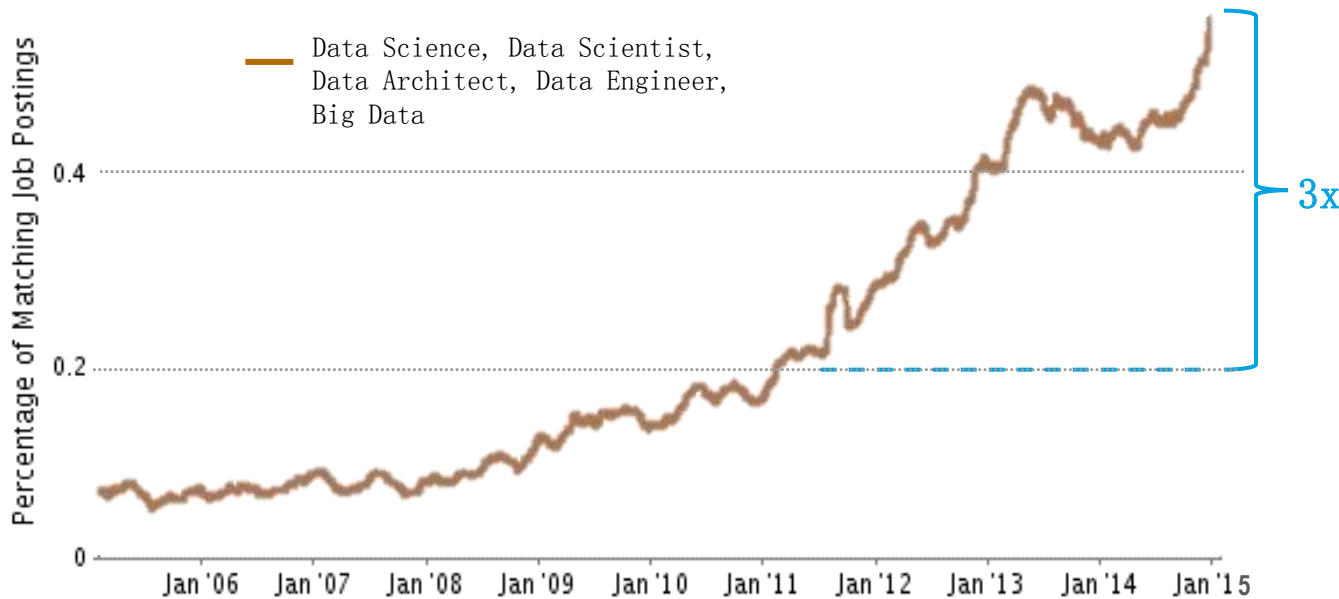
Google Web Search, Worldwide, 2005 – Present



*Among the technology trends that have shaped the conversation over the past decade, Big Data is dominating and is buoyed by the growth of IoT and mobility.*

# Dawn of the “Data Scientist”

“Big Data” Job Growth, 2006 – 2015

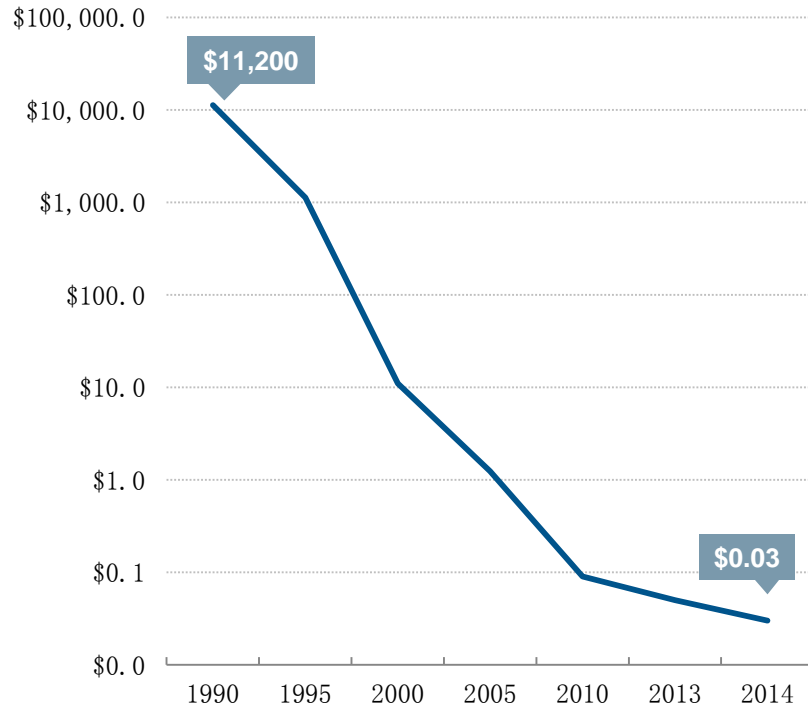


*Demand for “Big Data” skillsets from the labor markets has **tripled** in the last 3 years, as enterprises seek to leverage data as a means of competitive advantage, differentiation and strategic decision making.*



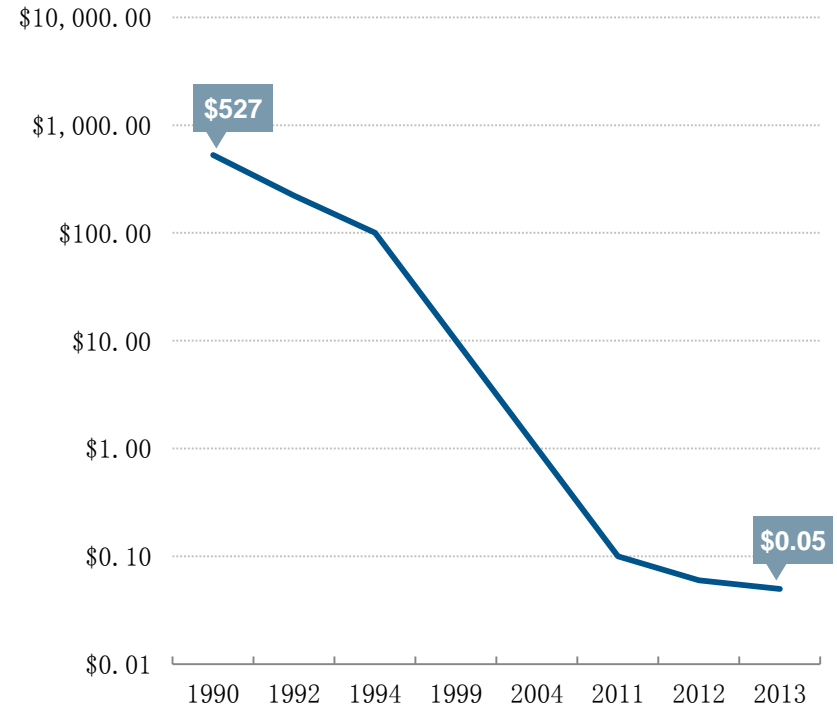
# Declining Infrastructure Costs

## Average Storage Costs per GB



*Data storage costs have fallen substantially, enabling the stockpiling of vast amounts digital information.*

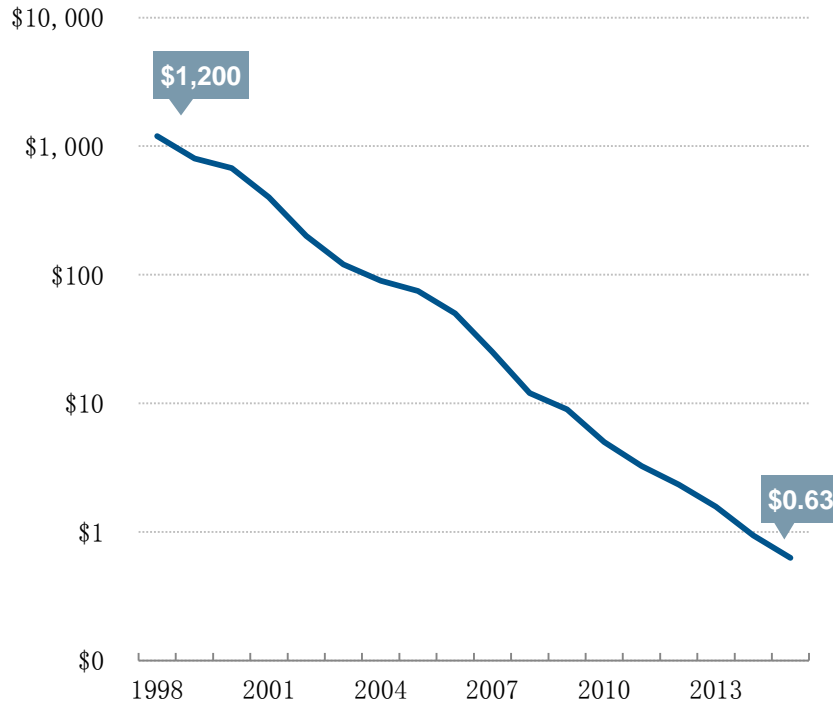
## Compute Costs per 1MM Transistors



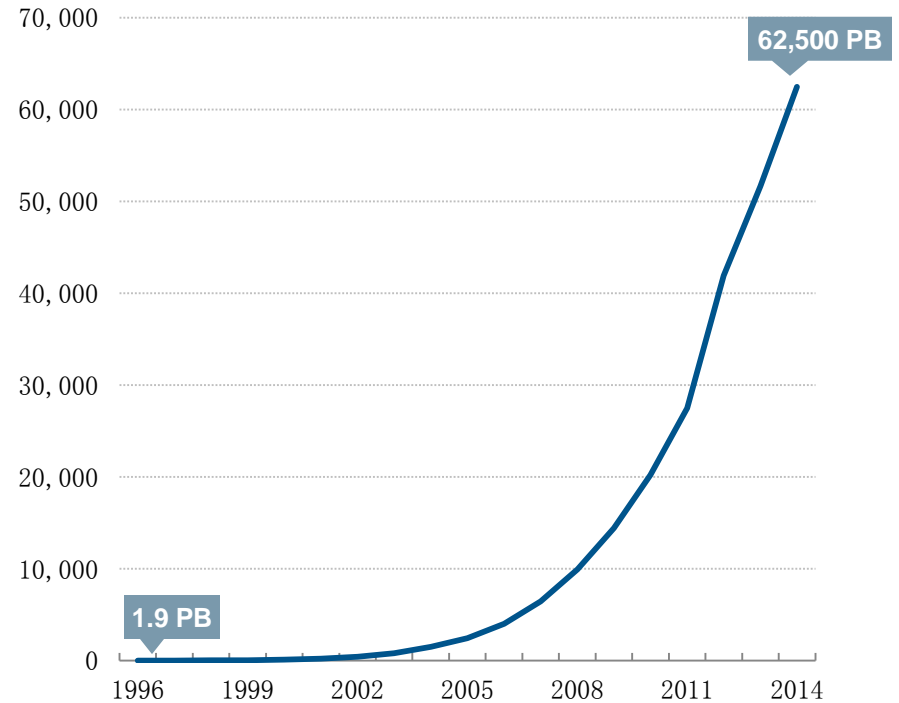
*Computing costs have fallen dramatically, enabling high computational power – the core of Big Data infrastructure.*

# Exponential Streaming Data Appetite

Internet Transit Prices per Mbps (Log)



Global IP Traffic, PB/year



*As bandwidth costs decline, hard drives are no longer getting bigger, as cloud and streaming services shift focus towards speed, reliability and accessibility.*

# Infrastructure to Build Upon

## Hardware Innovation

Compute Power, Speed  
and Cost

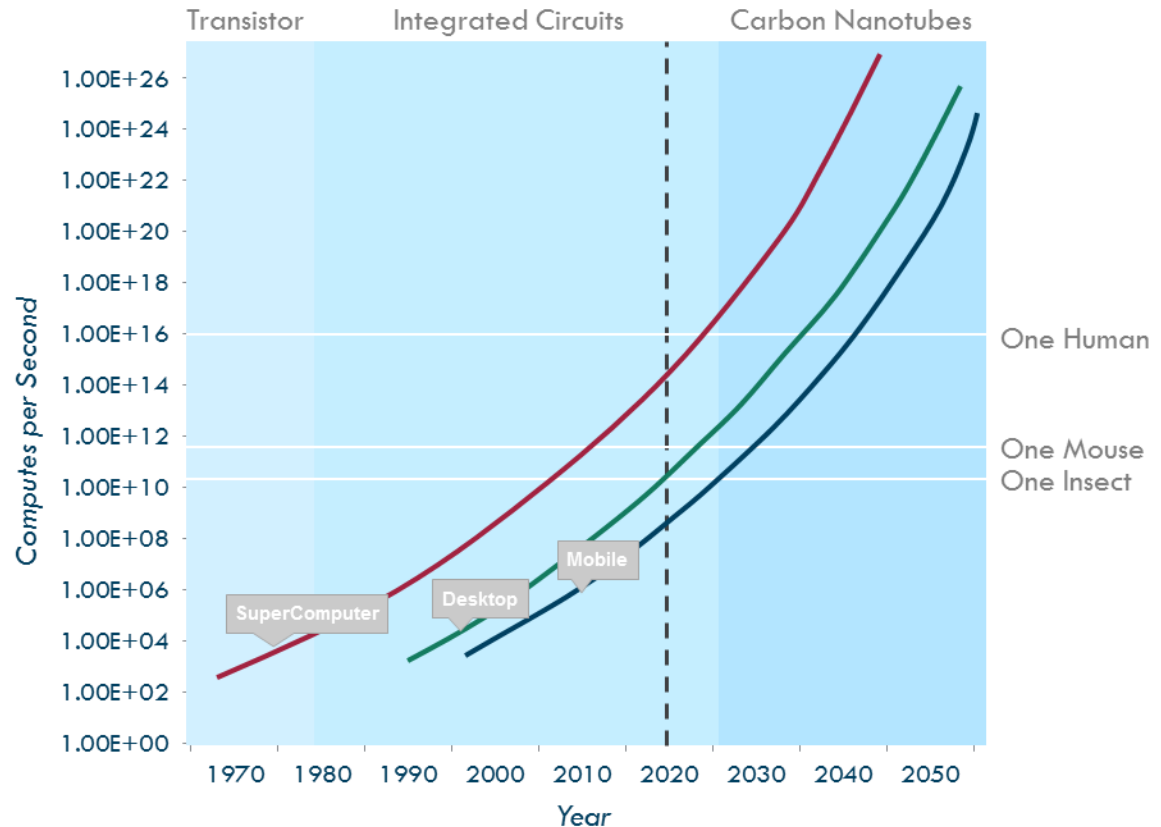
## Data Innovation

Sensorization,  
Access  
and Precision

## Software Innovation

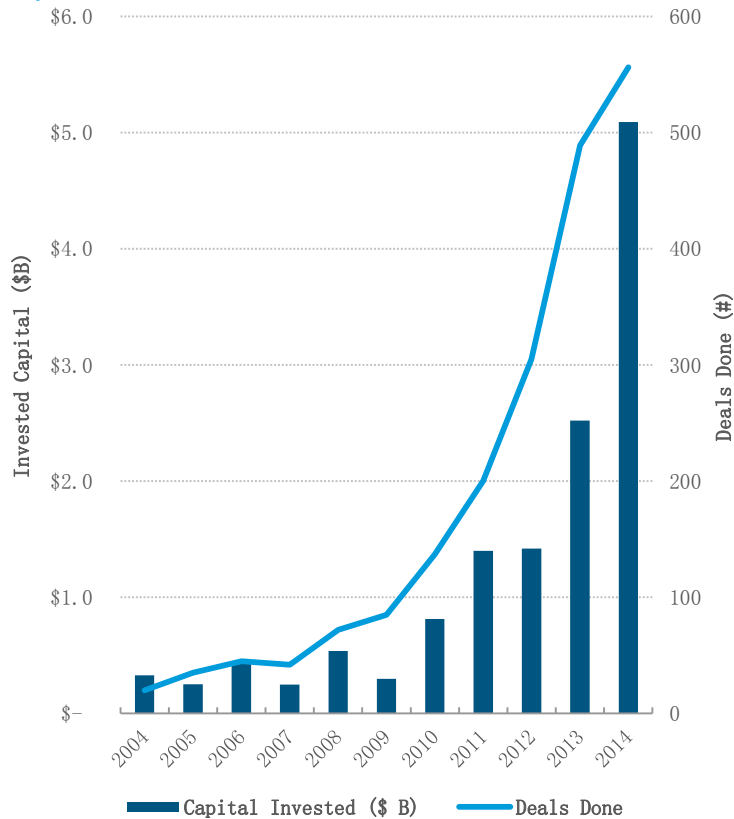
Analytics, Deep  
Learning and Smart  
Autonomy

Compute Power Exponentially Increasing

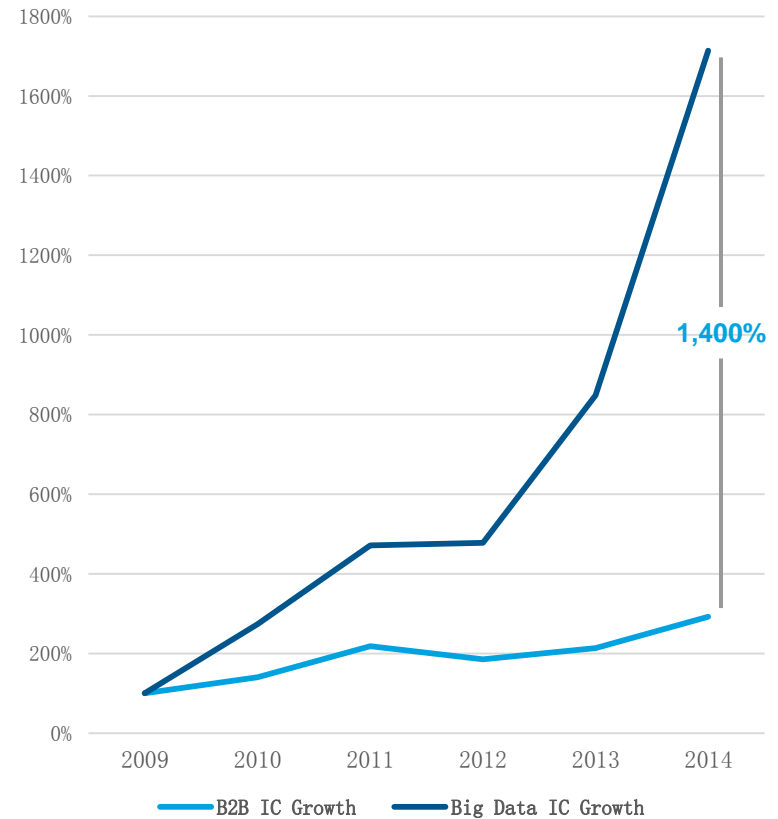


# Accelerating Venture Investment

## Venture Investments in Big Data / Analytics



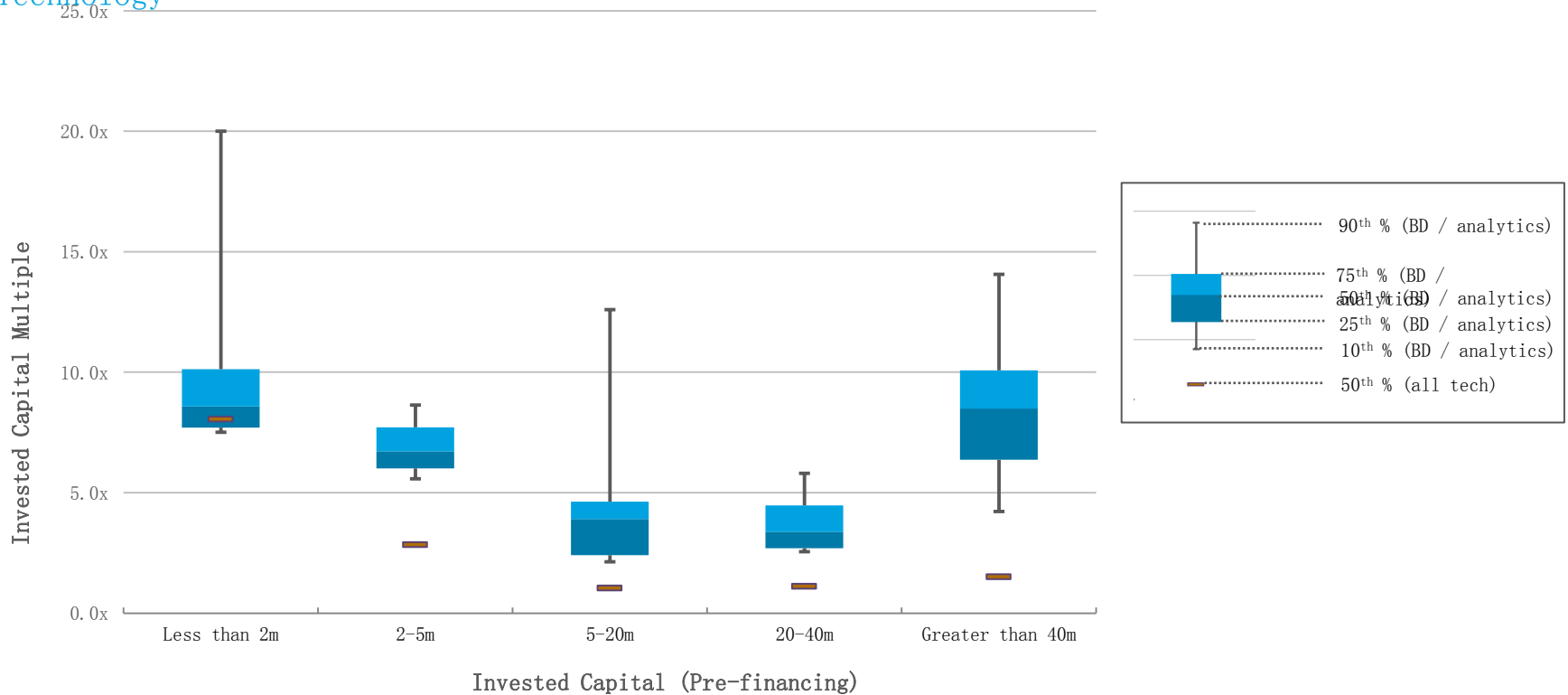
## Big Data vs. B2B Venture Investment Growth



*Venture investments in Big Data Analytics companies are accelerating, and capital allocations to Big Data Analytics companies far outpace allocations to B2B companies.*

# Big Data drives Big Value, requires Big Dollars

## Invested Capital Multiples - Big Data & Analytics vs. All Technology



*Across all stages, the invested capital multiples of Big Data Analytics companies exceeds the invested capital multiples of all technology companies. The higher invested capital multiples reflect investors expectations of significantly higher returns from big data investments relative to general technology investments.*

# The Alchemy Process

Digital Exhaust to Critical Resource: Massive Data

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## Big Data 1.0



- Data sources constantly created/stored
- IoT bridging physical & digital worlds

## Big Data 2.0



# The Alchemy Process

Digital Exhaust to Critical Resource: Developed Foundation

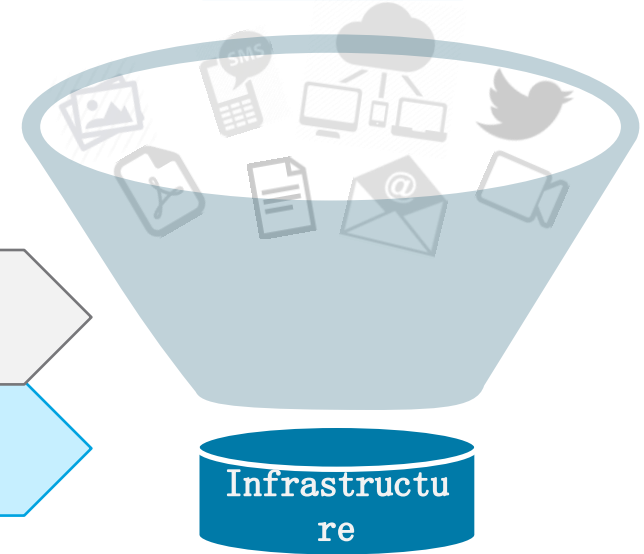
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## Big Data 1.0



- Data sources constantly created/stored
- IoT bridging physical & digital worlds
- Storage commoditized, prices fall

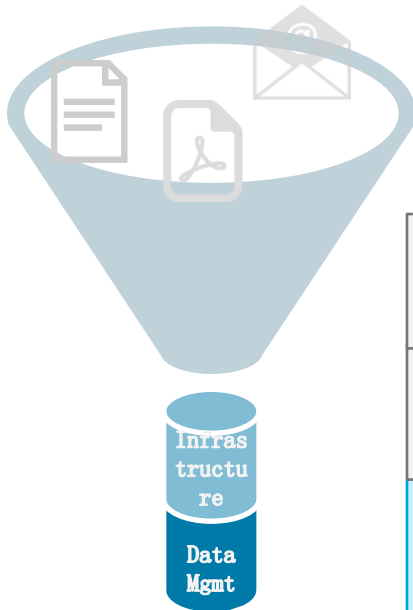
## Big Data 2.0



# The Alchemy Process

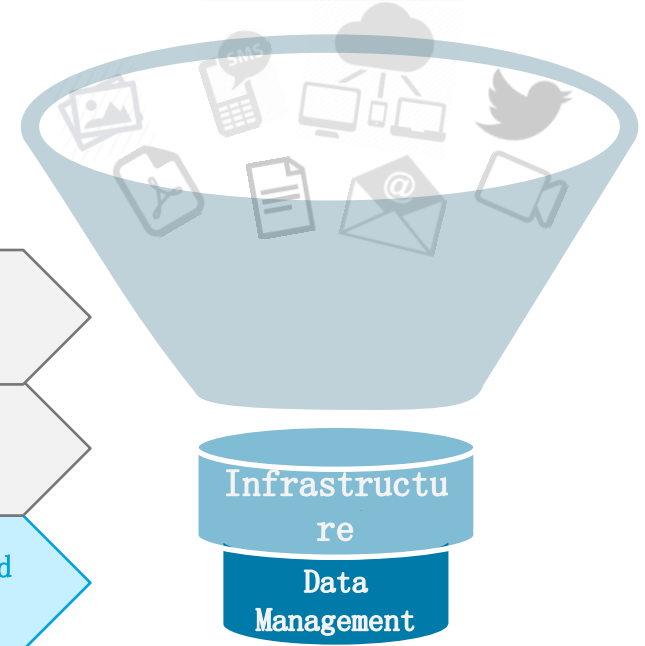
Digital Exhaust to Critical Resource: Broader Capabilities

## Big Data 1.0



- Data sources constantly created/stored
- IoT bridging physical & digital worlds
- Storage commoditized, prices fall
- Compute cost decline, as distributed file systems enhance performance

## Big Data 2.0

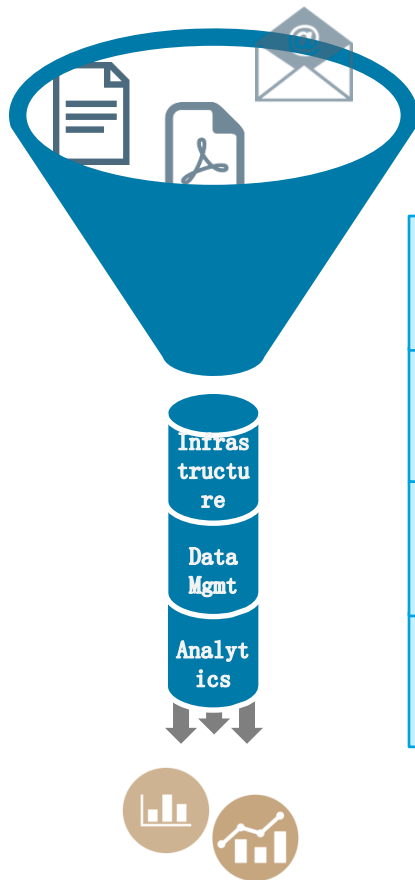




# The Alchemy Process

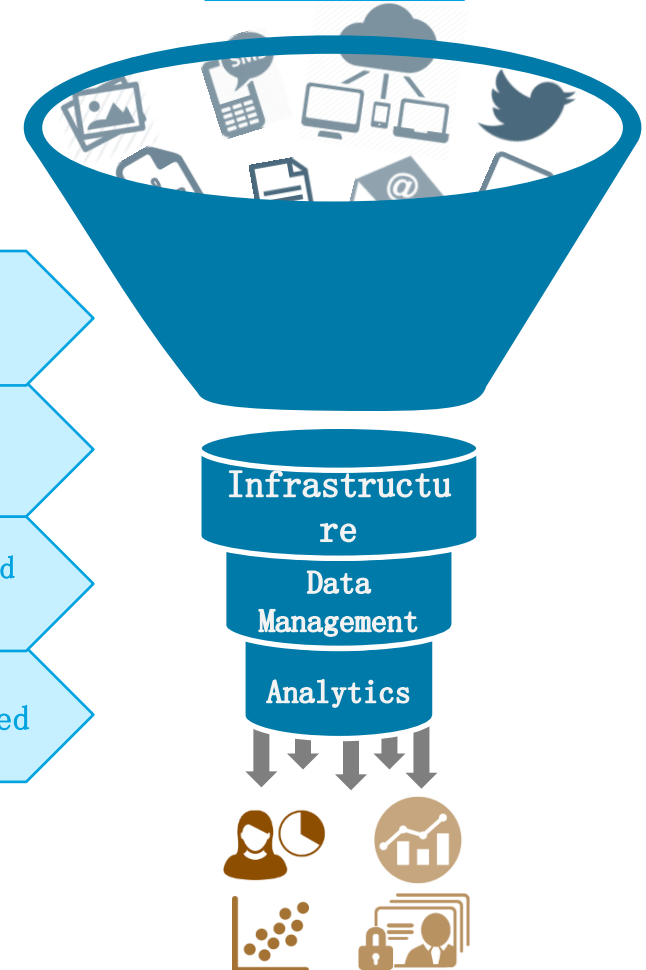
Digital Exhaust to Critical Resource: Expanded Application

## Big Data 1.0



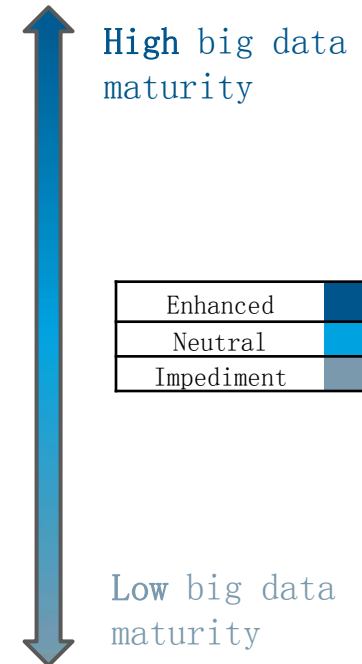
- Data sources constantly created/stored
  - IoT bridging physical & digital worlds
  - Storage commoditized, prices fall
  - Compute cost decline, as distributed file systems enhance performance
- Expanded use cases & insights enabled

## Big Data 2.0



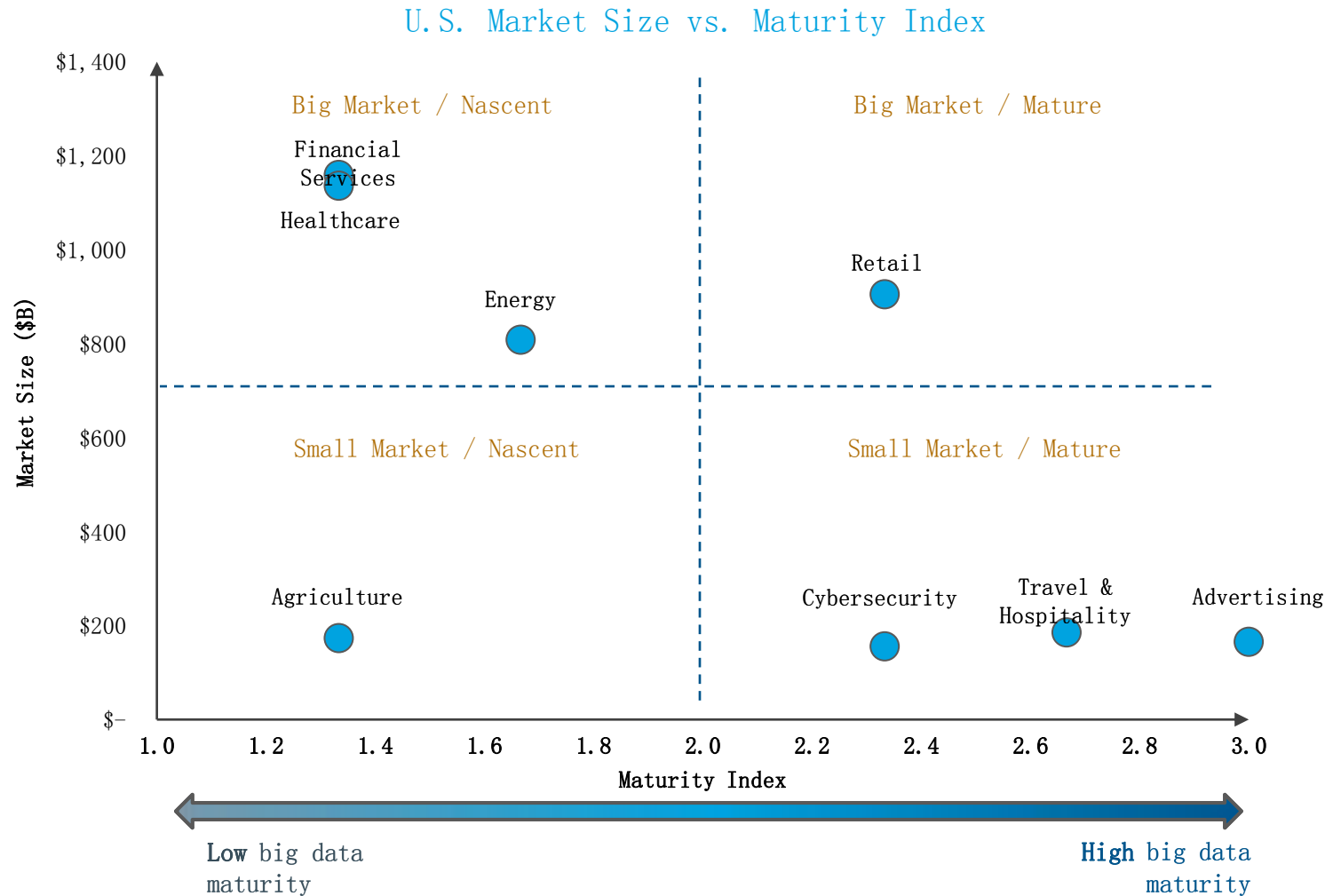
# Maturation of Big Data in Verticals

Sector	Level of Regulatory Oversight	Ease of Data Capture	Level of Technology Enablement	Maturity Index
Advertising	3	3	3	3.0
Travel & Hospitality	3	2	3	2.7
Cybersecurity	2	2	3	2.3
Retail	3	2	2	2.3
Energy	2	2	1	1.7
Healthcare	1	1	2	1.3
Financial Services	1	2	1	1.3
Agriculture	2	1	1	1.3



*Industries with lower data friction demonstrate early adoption while higher friction areas have larger market opportunities*

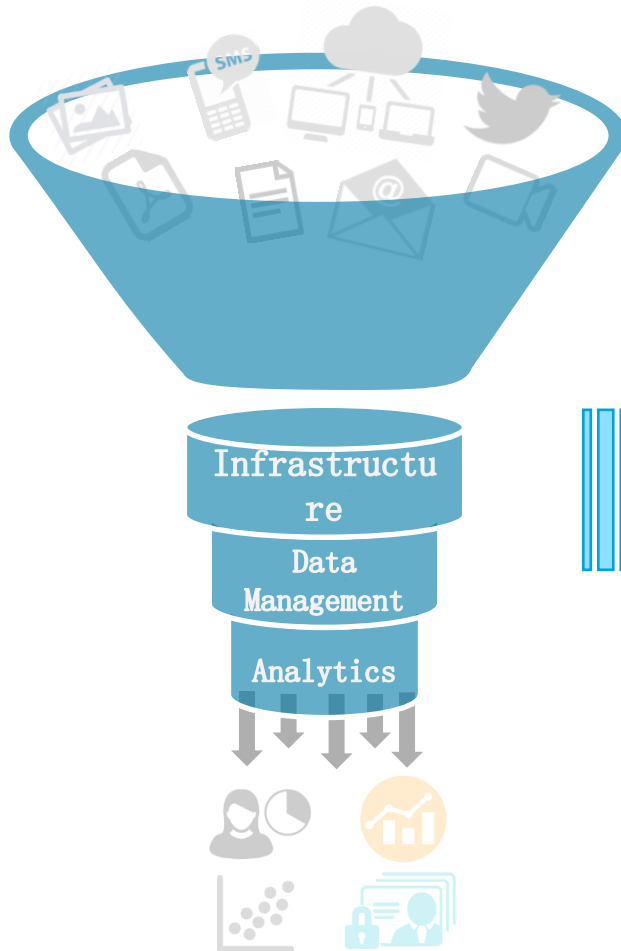
# Lower Maturation in Large Markets . . . Huge Potential



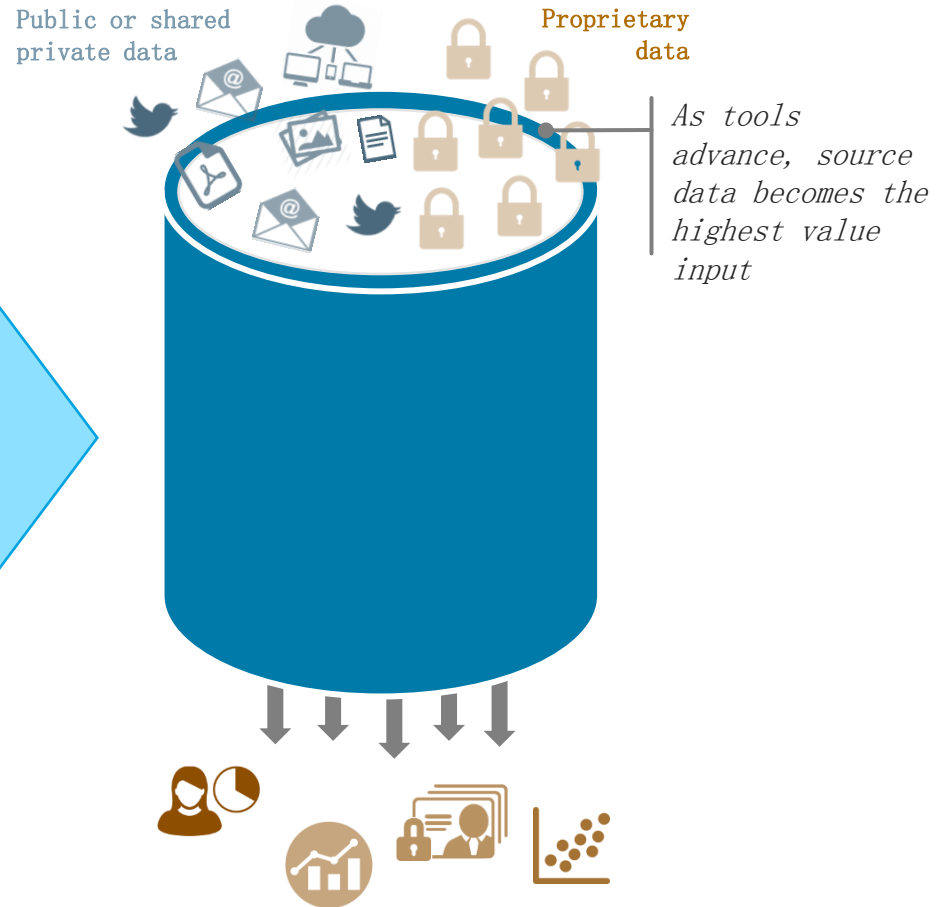
# The Alchemy Process

## The Future of Big Data: Data Access

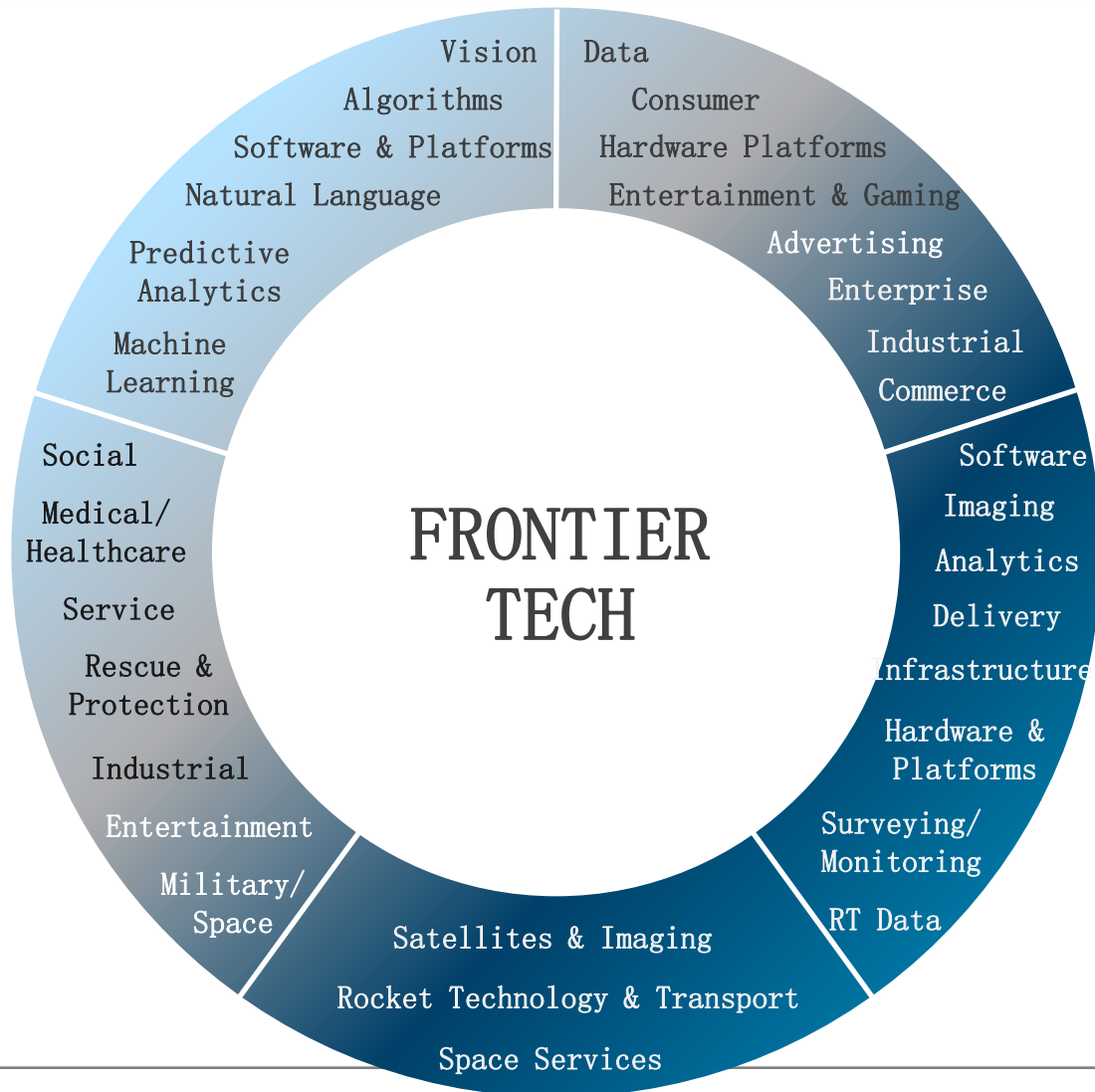
### Big Data 2.0



### Big Data NEXT



# Beyond Big Data



# Big Data's New Frontier(Tech)

FrontierTech can be defined as new industries, or a reinvention of existing industries, made possible by advancements in technologies that represent the potential for a paradigm shift affecting business, economics, the environment and the whole of society.

Design Computing  
Mixed-Reality Developments  
Robotics Virtual-Reality  
Artificial-Intelligence Frontier  
Paradigm-Shift Humanity  
Society Drones Space Technology  
Capabilities Augmented-Reality  
Innovation Man-vs-Machine  
Advancements

**“We can only see a short distance ahead, but we can see plenty there that needs to be done.”**

Alan Turing,  
British Pioneering Computer Scientist

**“Our technology, our machines, are part of our humanity. We created them to extend ourselves, and that is what is unique about human beings.”**

Ray Kurzweil,  
Director of Engineering at Google,  
Author of *The Age of Spiritual Machines* and *The Singularity Is Near*

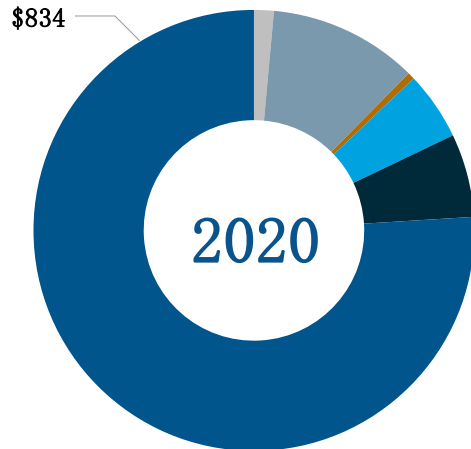
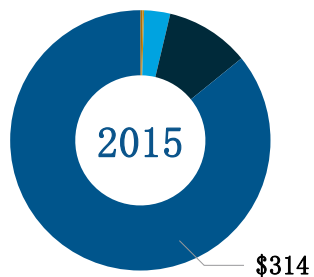
# Big Data Driving New Industries

Current and expected market size by FrontierTech industry.

## Including Space

### 5 Year CAGR

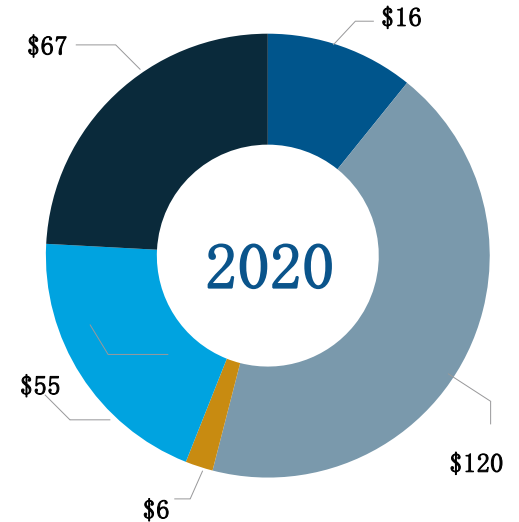
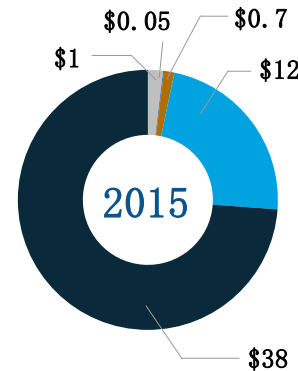
- 59% Virtual Reality
- 266% Augmented Reality
- 53% Drones
- 10% Robotics
- 29% Artificial Intelligence
- 15% Space



## Excluding Space

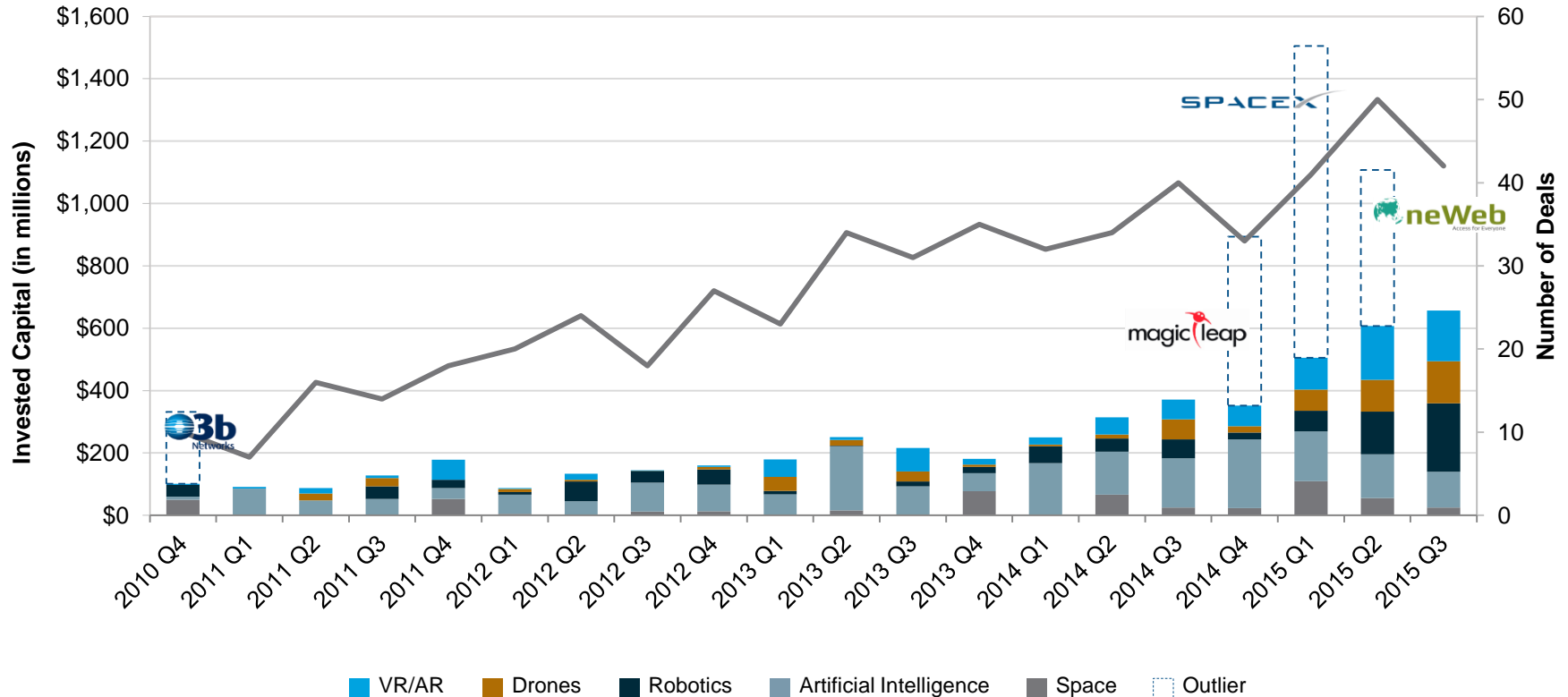
### (\$ in billions)

- Virtual Reality
- Augmented Reality
- Drones
- Robotics
- Artificial Intelligence
- Space



Source: Digi Capital, Markets and Markets, Space Foundation, Parliamentary Space Committee, RoboUniverse, Future Market Insights, PR Newswire

# FrontierTech: Accelerating Investment

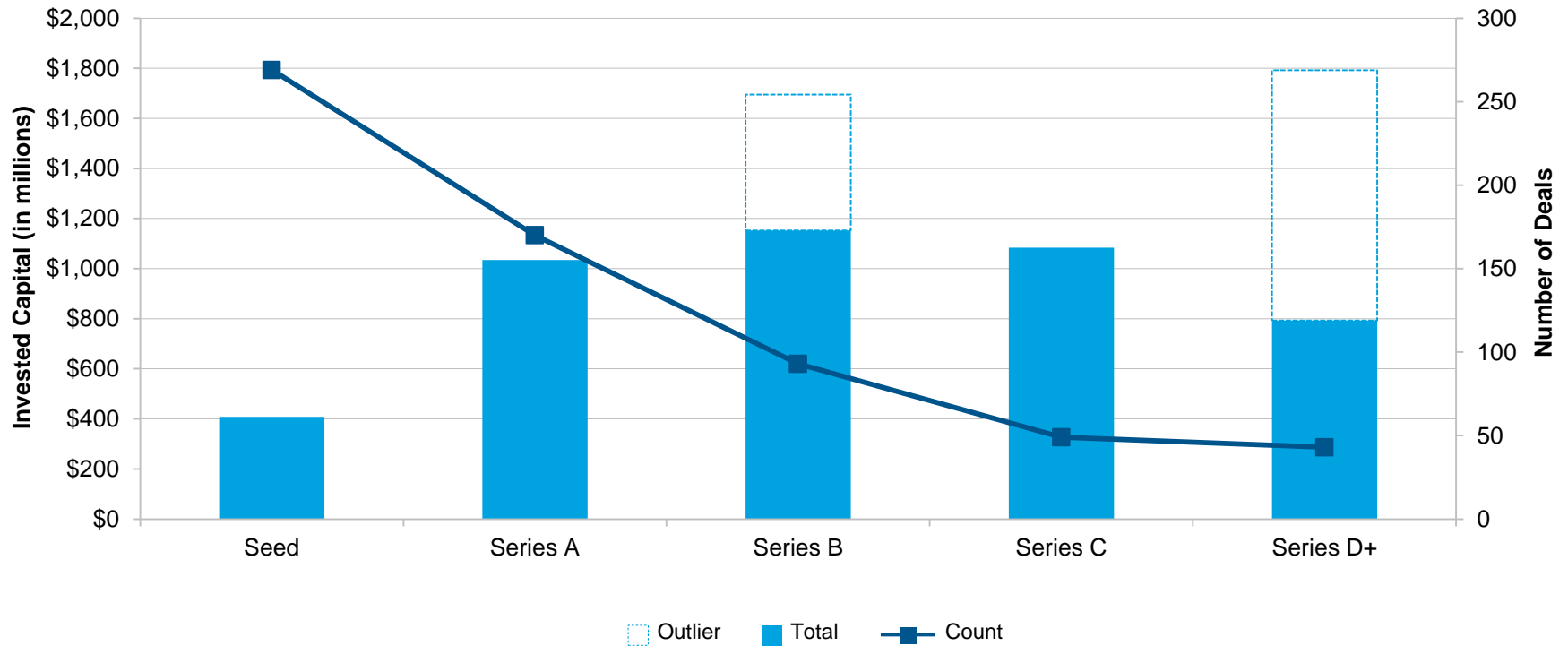


The number and amount of investment in all areas of FrontierTech has been increasing, with a significant ramp in funding in the past 18 months.

\*Outliers represent investments greater than 45% of the invested capital in one funding round.



# FrontierTech: Early Stages

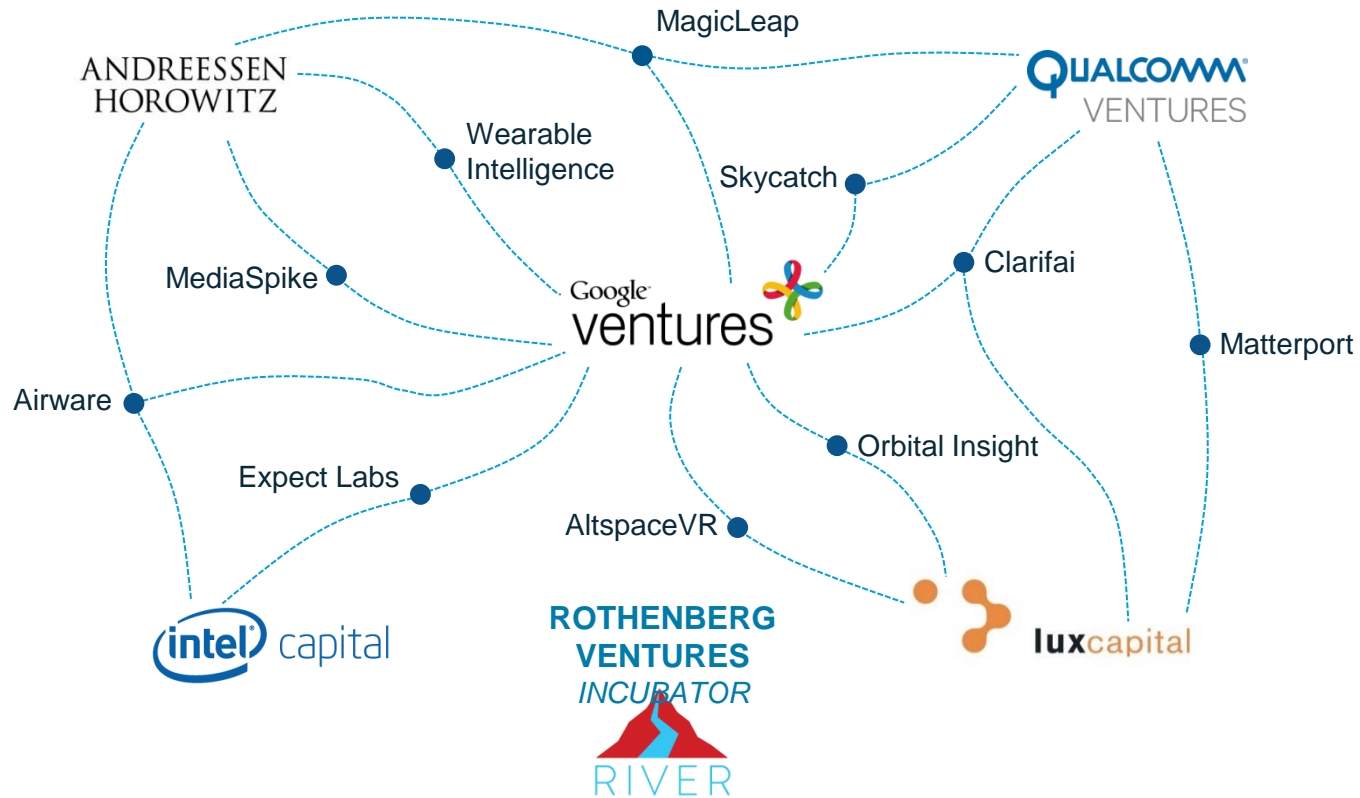


Funding trends illustrate that we are still very early in the exploration of FrontierTech over the past five years.

\*Seed also includes some Crowdfunding. Deals accounted for between Q4 2010 and Q3 2015.

# FrontierTech: Partnering Early

The pursuit of the next Centicorn, a company that only comes around every decade and brings an impact that is life-changing to us all, requires more frequent partnering of large corporates with traditional venture players.



# FrontierTech: Beyond Search

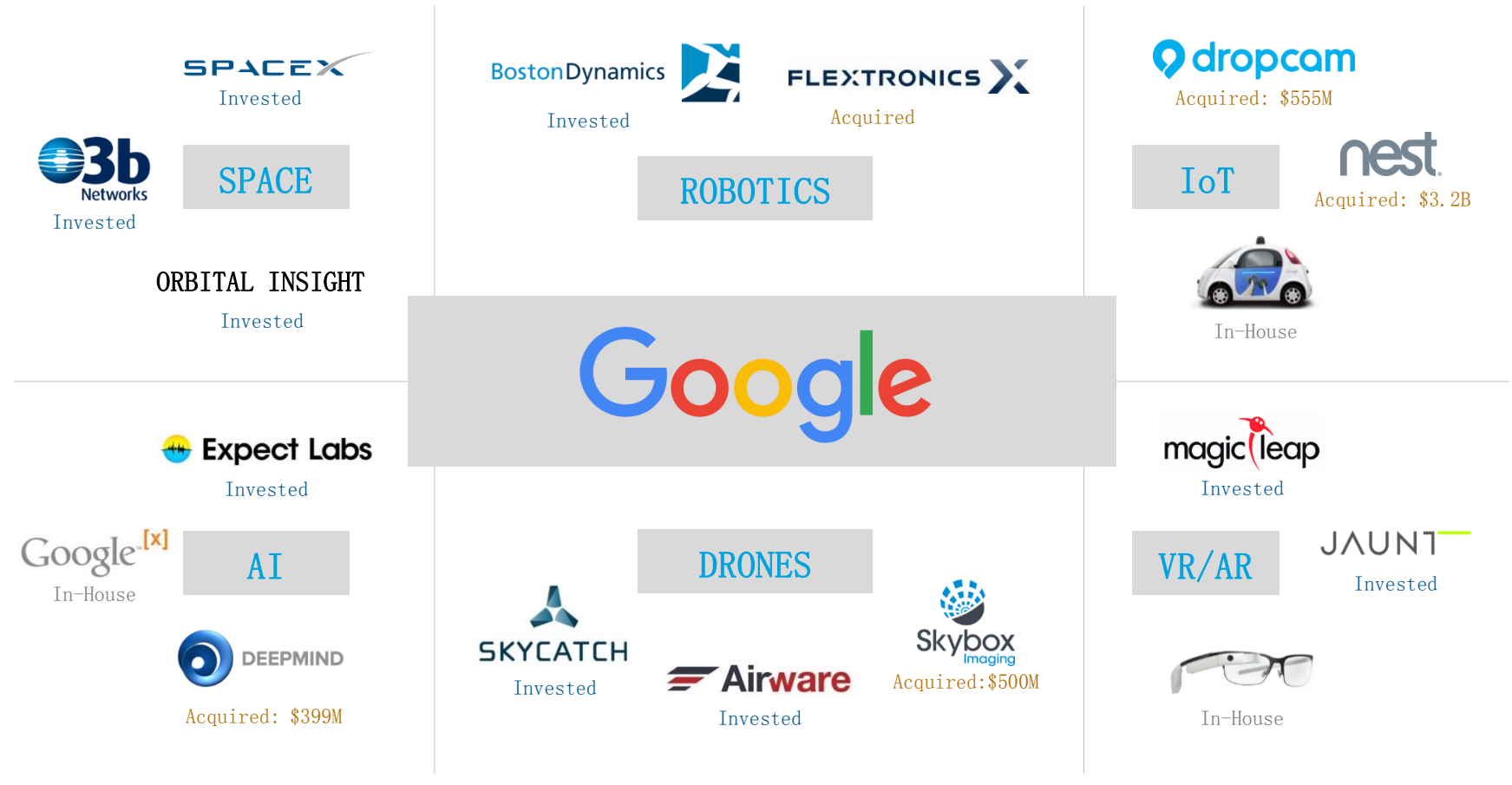
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**“One of our big goals in search is to make search that really understands exactly what you want, understands everything in the world. As computer scientists, we call that artificial intelligence.”**

Larry Page,  
CEO of Google (Alphabet)  
October 2005

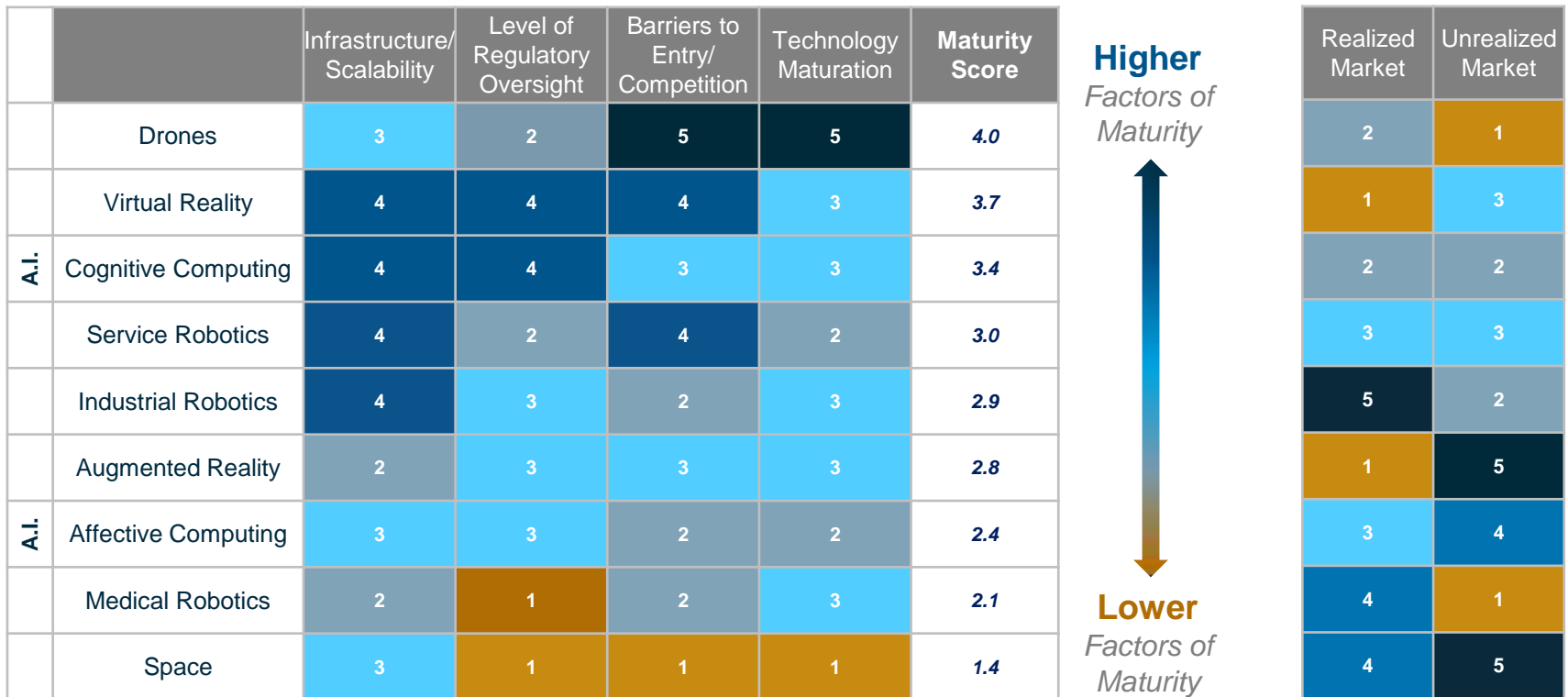
# FrontierTech: Searching for the Beyond

Both organically and inorganically, Google is pursuing big investments in all areas of FrontierTech.

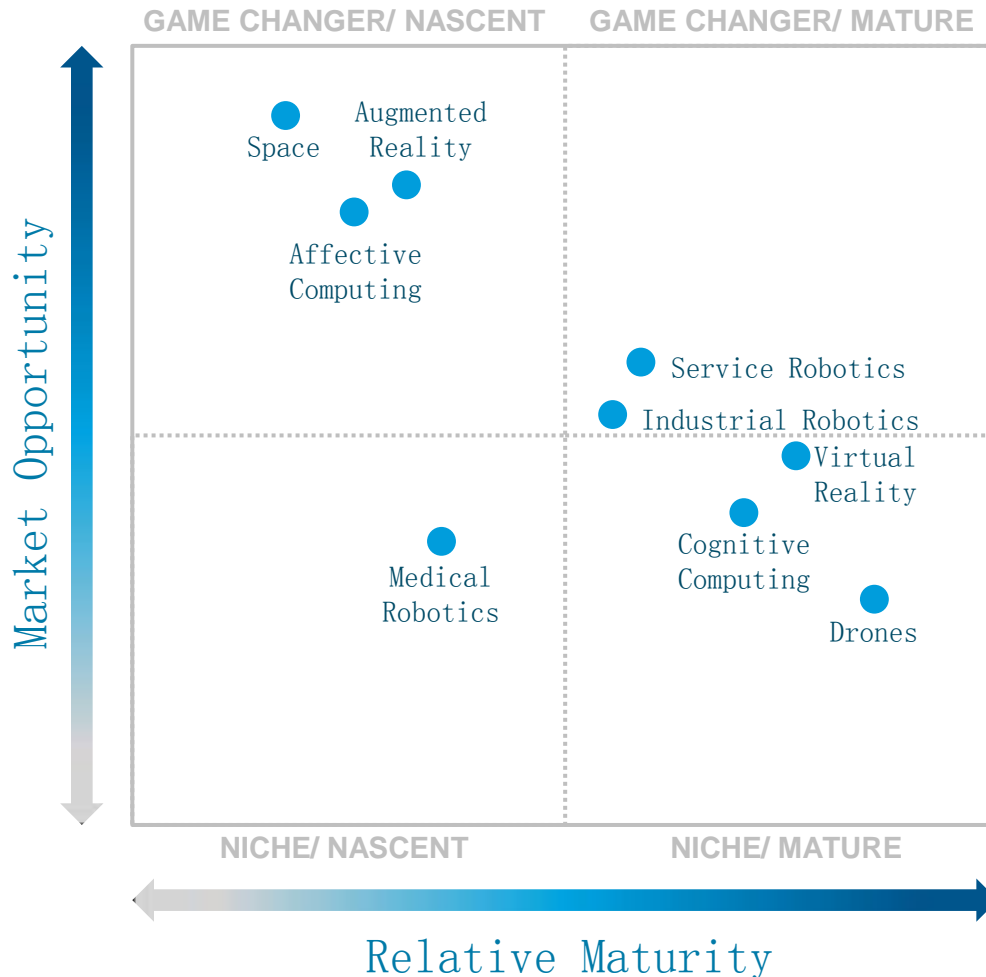


# FrontierTech: Transitioning

This Relative Index represents the balance between the current technological capabilities coupled with the established and future potential inhibitors to accelerated growth and the stark difference between the current and future market opportunity.



# FrontierTech: Transitioning



Overall, FrontierTech is still early in its potential, however, balancing the current progress against the future market opportunity highlights the vast game-changing potential of the underlying technologies.

# FrontierTech: Potential Obstacles

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## Technological Capabilities

Will the drivers of the recent developments in FT continue?  
Will the technologies advance to solve the final solution?

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## Scalability

Is this niche applicable or broad range applicable?  
Is the required infrastructure in place?  
Will unforeseen regulation impede the use cases?

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## Funding

Many more phases of development are required.  
Generally capital-intensive industries

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## Social Adoption

Will the technology be easy to integrate into everyday?  
Will it be uncomfortable or unnatural to use?

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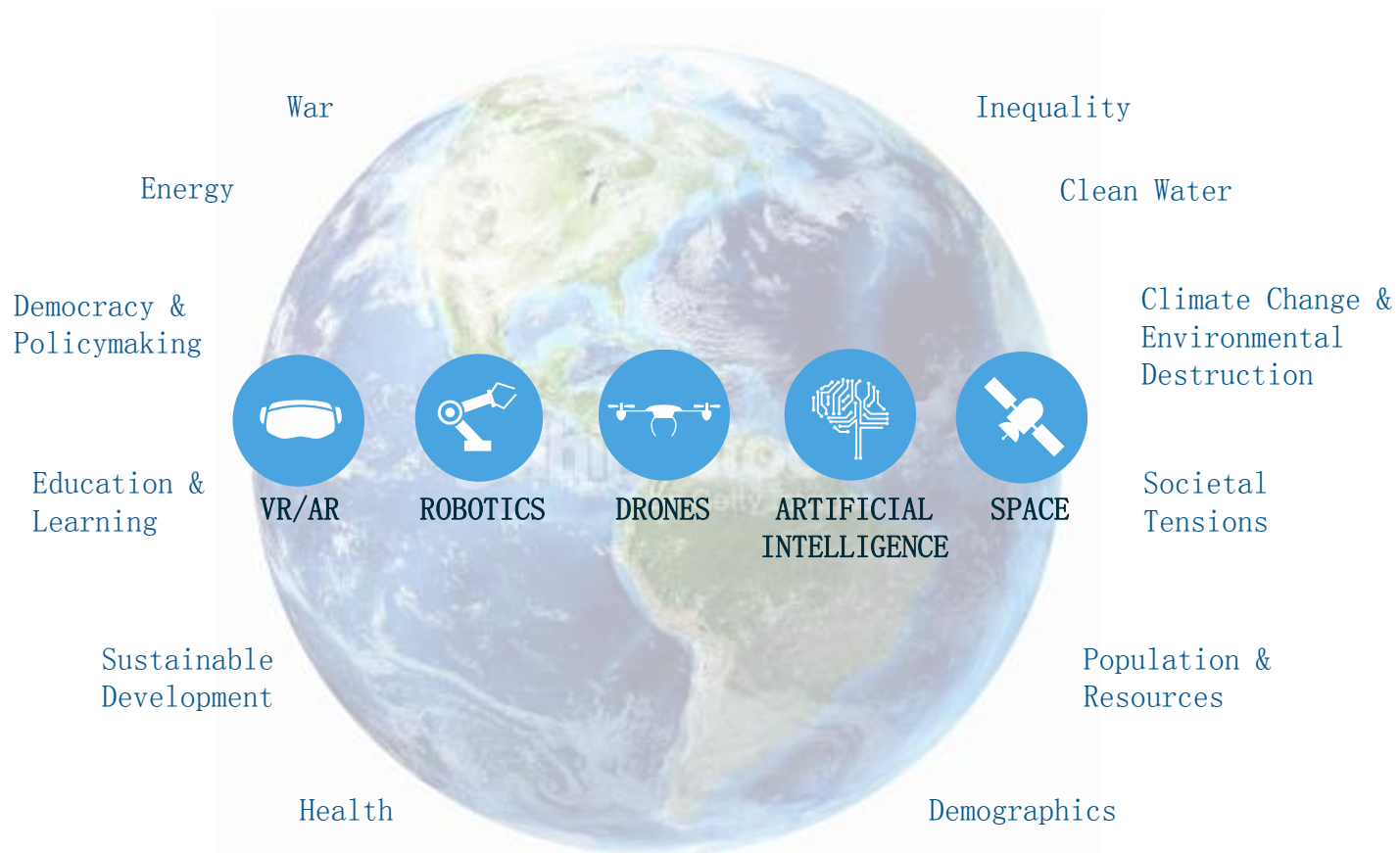
## Demand

Is there a real need or does demand need to be established?  
Is the market potential large enough to warrant the investment in the near term for longer term gain?

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# FrontierTech: Tomorrow

Some of the key issues outlined by the Millennium Project will be addressed principally through the maturation of the different industries of FrontierTech.





# Concluding Remarks

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- *While much hyped over the past decade, the decade of Big Data disruption is in our windshield, not our rearview mirror, having gorged on “low-hanging” fruit. However, the innovation in big data talent and tools effectively removes impediments to leveraged utilization, allowing us to reach higher onto the tree*
- *Today, there is a race for the data scientist and tools to drive value from data. Tomorrow, as the impediments dissolve and the ubiquity of tools proliferate, the race will be for proprietary source data input needed to harvest future diamonds*
- *The biggest problems of Today and Tomorrow, whose potential solutions currently constrained by human capabilities, are solvable leveraging the enhanced capabilities of artificial intelligence. We are in the earliest stages of development of the most exciting quarter century of mankind.*



Thank you.

# Disclaimers

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