

Uberizing Energy:

How Digital Technologies Will Change the Competitive Landscape of the Energy Sector

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Associate Professor Robert K. Perrons
Queensland University of Technology
Brisbane, Australia
www.perrons.net



Who am I?

- Since 2011, Associate Professor at Queensland University of Technology in Australia
- Before that, Shell International E&P 
 - Executive Coordinator of global R&D portfolio
 - Smart Fields digital oilfield program
- PwC Chair in Digital Economy  , projects with  Microsoft and 
- Serve in Australian Government's "Expert Network" to provide advice on emerging energy technologies
- Adviser to MIT's Mining, Oil & Gas Club and several energy and resource sector tech startups around the world

Overview

- Why talk about Uber?
- What technological advances are contributing to these new marketplace dynamics?
- How are value networks and industries being reconfigured by these technological changes?
- What might this mean for the energy industry?

What has



ie?

- Ravi, the taxi driver that took me to the Brisbane airport on April 28
- His rough estimate:
 - 2 years ago, 20-minute wait in between jobs at this time of year.
 - Now, 90-minute waits are pretty normal.



The demise of the taxi industry in the U.S.

- In Q1 2014, 37% of the business traveler ground transportation market was delivered via taxis
 - Uber and other ride-hailing services were only 8%
- By Q1 2018, however, taxis were responsible for only **6%** of the market
 - Uber and other ride-hailing services had grown to **70.5%**

Meanwhile, how is



U B E R

Uber Technologies Inc [+ Add to myFT](#)

Uber seeks \$91.5bn valuation in this year's largest IPO

Ride-hailing app could raise up to \$9bn and will sell about \$500m of stock to PayPal



Uber is pitching shares to investors at an initial range of \$44 to \$50 each

Nicole Bullock in New York, **Tim Bradshaw** in London and **Shannon Bond** in San Francisco

APRIL 26, 2019

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A working definition of “Uberization” based on this evidence

- Digital technologies enabling tectonic shift in profitability and market power within an industry
- Only took a few years
- The company that wins often isn't an industry incumbent—and may not even have existed before
- New market leader plays “digital intermediary” role, but doesn't invest in capital-intensive parts of the sector



Note: I did not come up with the fruit fly metaphor myself. It's a recurring theme in:
Fine, C. H. (1998). *Clockspeed: Winning Industry Control in the Age of Temporary Advantage*. Reading, Massachusetts: Perseus Books.

Industry clockspeed



Great innovation is happening in green energy technologies...

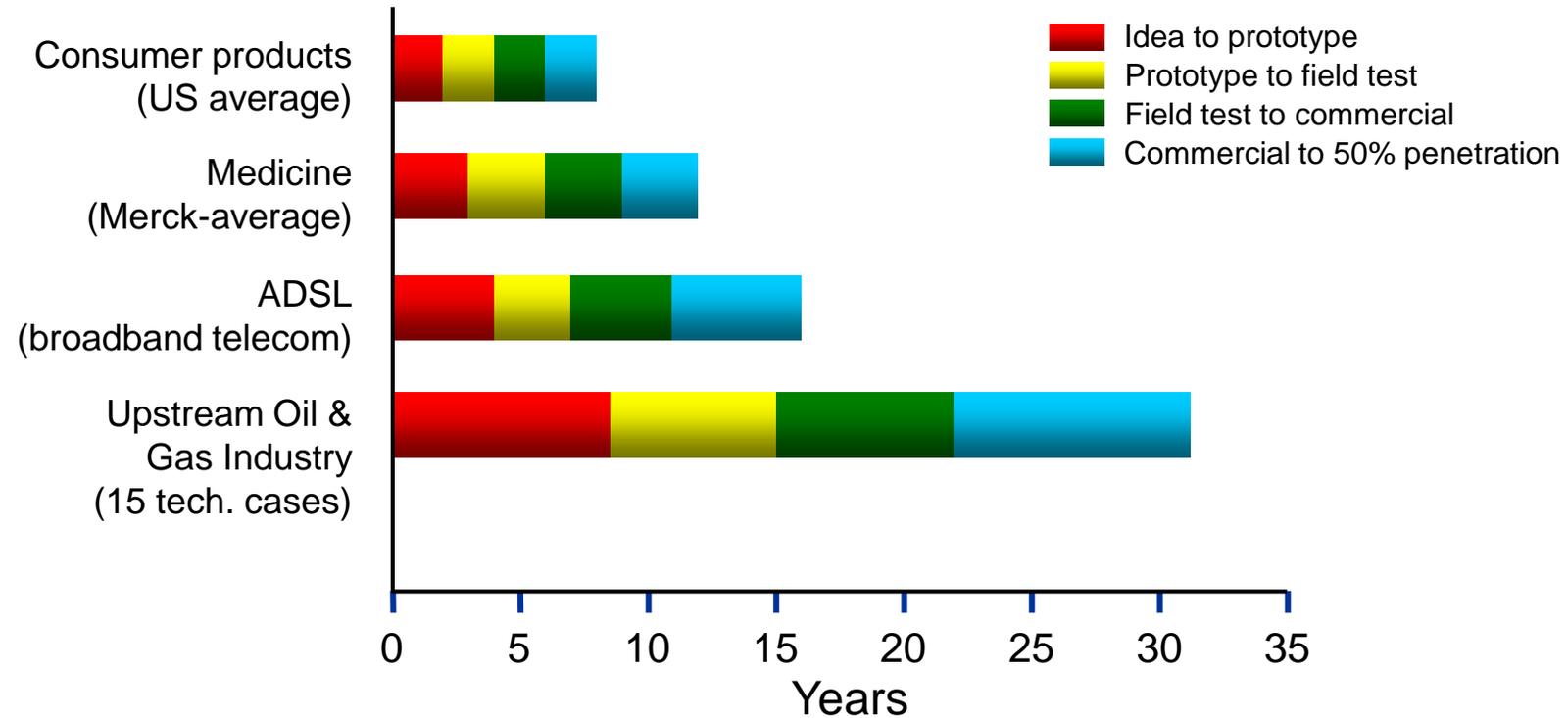


... and in more traditional energy markets



Shell's *Prelude* FLNG facility

Relatively slow rate of innovation in the upstream oil & gas industry



“... the energy sector... is unusually large, diverse, and complex.”

Richard G. Newell, Duke University



“... the energy system is so big, so complicated, so important, and therefore so slow to change”

Richard K. Lester, MIT
David M. Hart, George Mason University

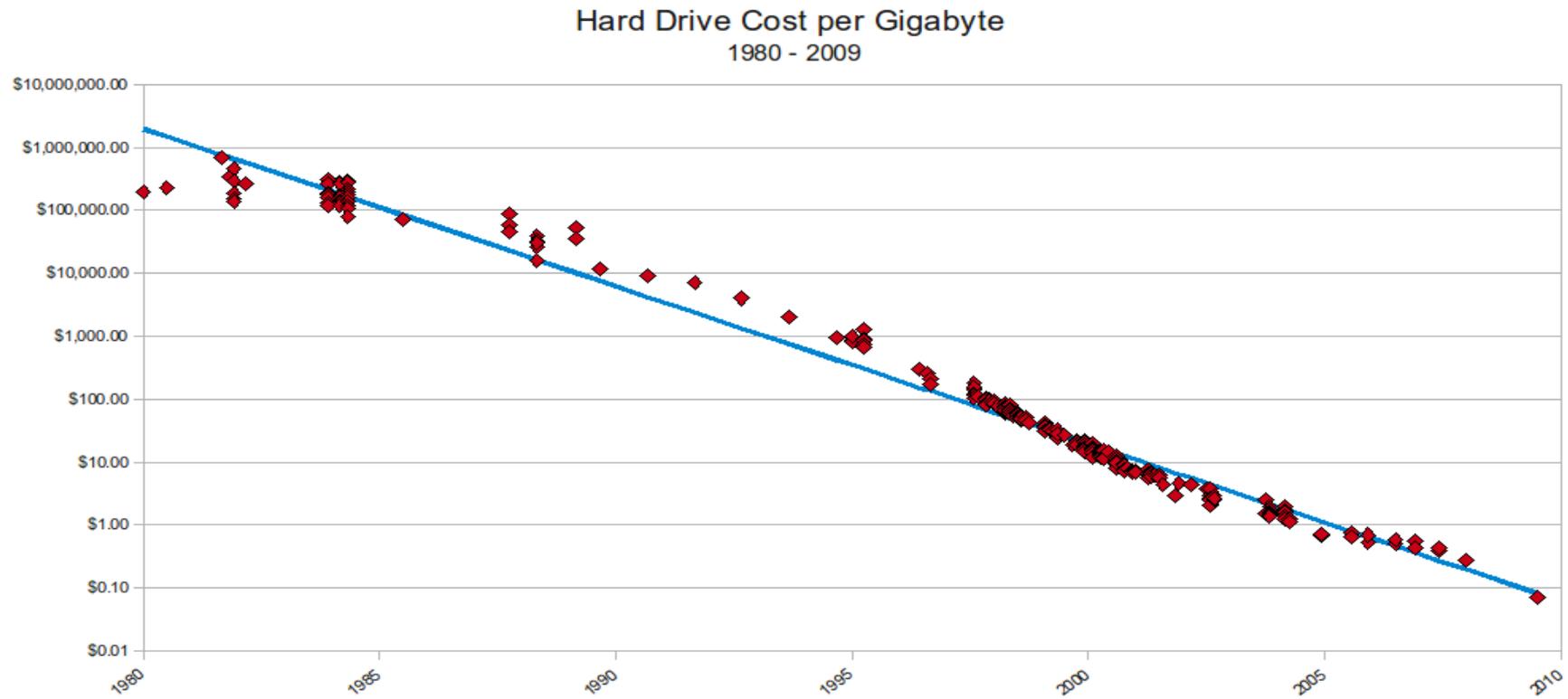
Ubiquitous computing



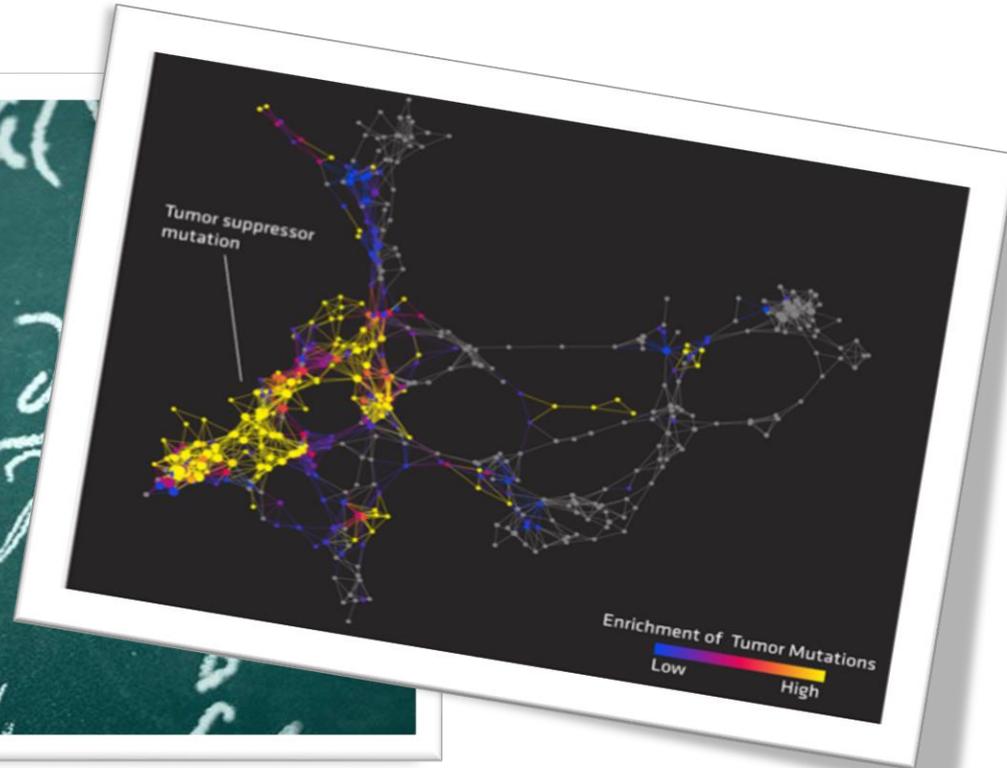
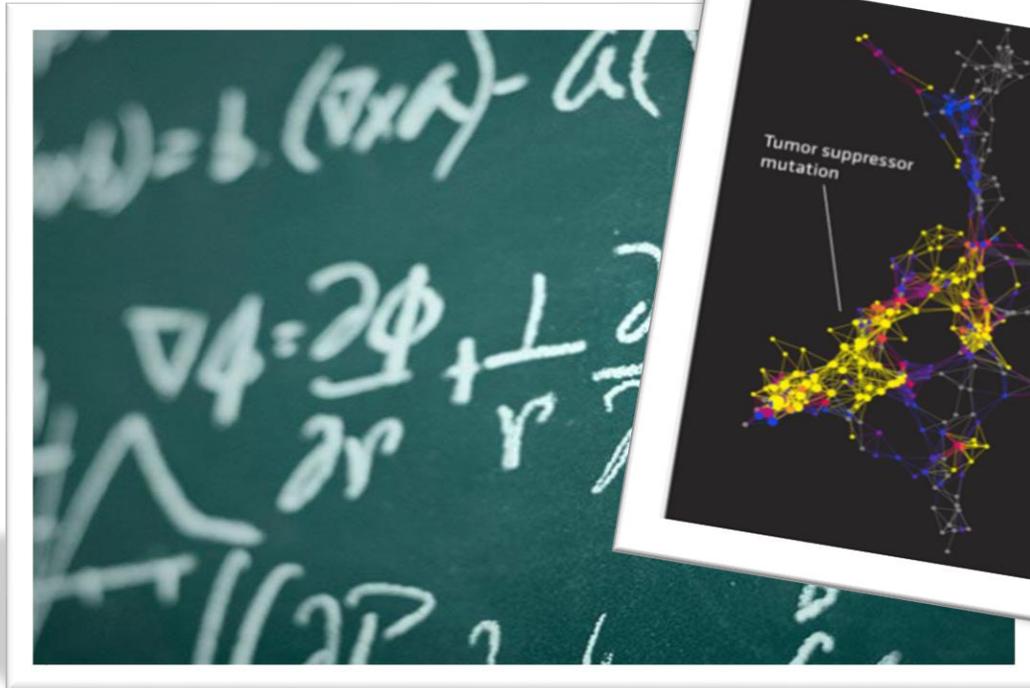
Internet reached “critical mass”



Precipitous drop in price of data storage



Advances in mathematics



Proliferation of cloud computing



Emergence of “digital natives”



Cumulative result: Changes in connectivity within society and markets



Effect of digital technologies on value networks

- Data that used to be transmitted via internal processes can now be seamlessly shared digitally
- Increased transparency of and accessibility to inner workings of system can lead to increased modularity of architecture
 - Mix-and-match parts of electrical network like parts of a stereo system

Digital technologies can disaggregate and modularize industries



Physical networks can be decoupled from their supporting functions



BUSINESS

Silicon Valley to Big Oil: We Can Manage Your Data Better Than You

Microsoft, Amazon, Google offer data-management services, but some energy companies are leery

Look who just moved into the neighborhood...



The days of \$2 a gallon gas are over in the U.S., as shifts in global oil production drive up prices. The WSJ's Stephanie Yang explains what's fueling the recent rise. Photo: Patrick T. Fallon/Bloomberg News

By *Christopher M. Matthews*

Updated July 24, 2018 11:10 a.m. ET

HOUSTON—A Google executive wearing white jeans and a navy T-



Total, Google Cloud to Team on AI for Upstream

Matt Zborowski, Technology Writer | 26 April 2018

Topics: Data and information management Reservoir characterization Reservoir description and dynamics



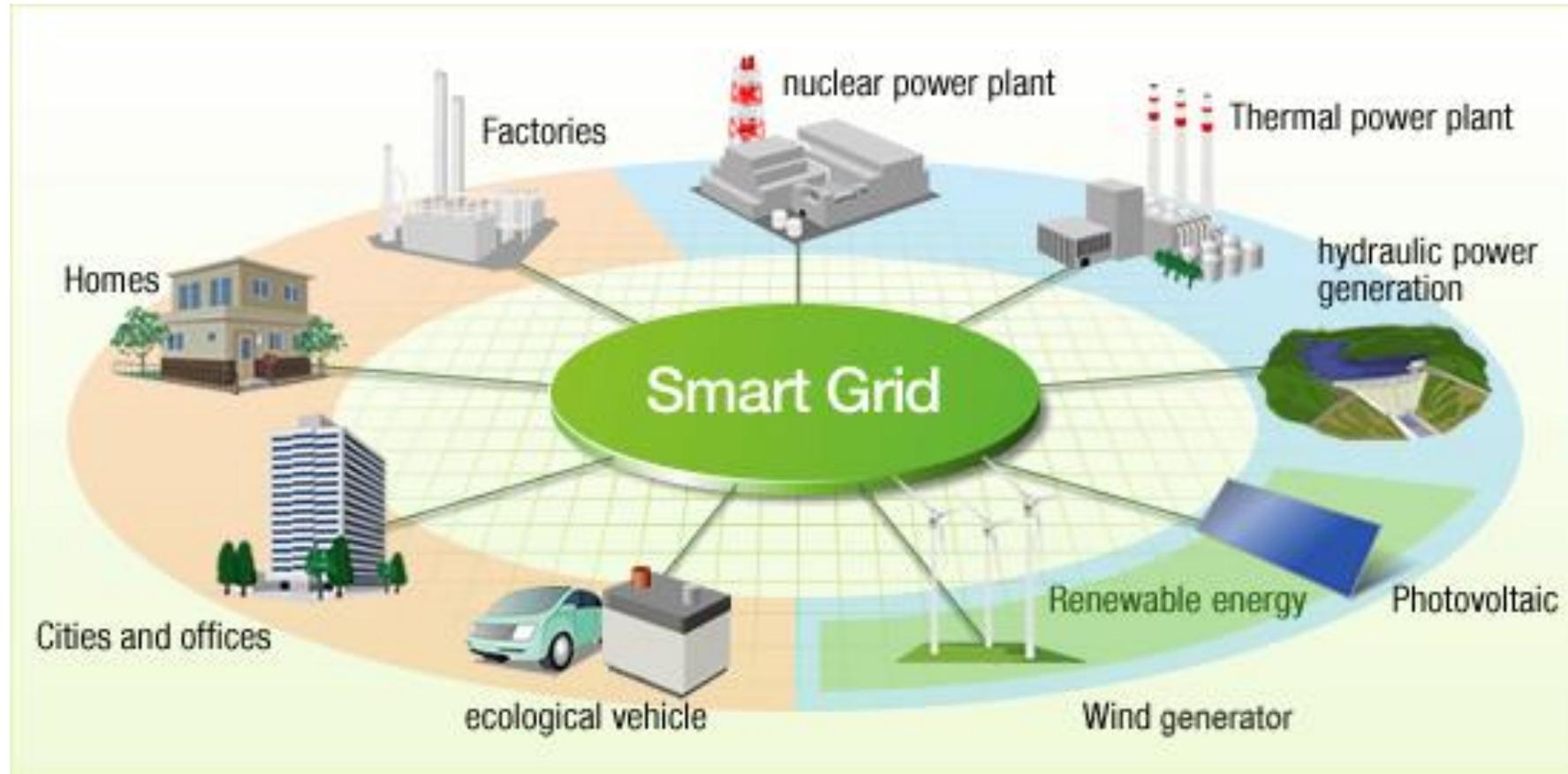
Can we call it an invasion if we're inviting them in?

Changing cast of characters in the energy industry



- GE's acquisition of Baker Hughes announced in 2016
- A clever strategy for plugging GE's "Industrial Internet of Things" (IIoT) technology platform into the oil & gas space
- GE is now divesting Baker Hughes, but not because of IIoT

Smart grids and the rise of the “prosumer”



Data as an asset

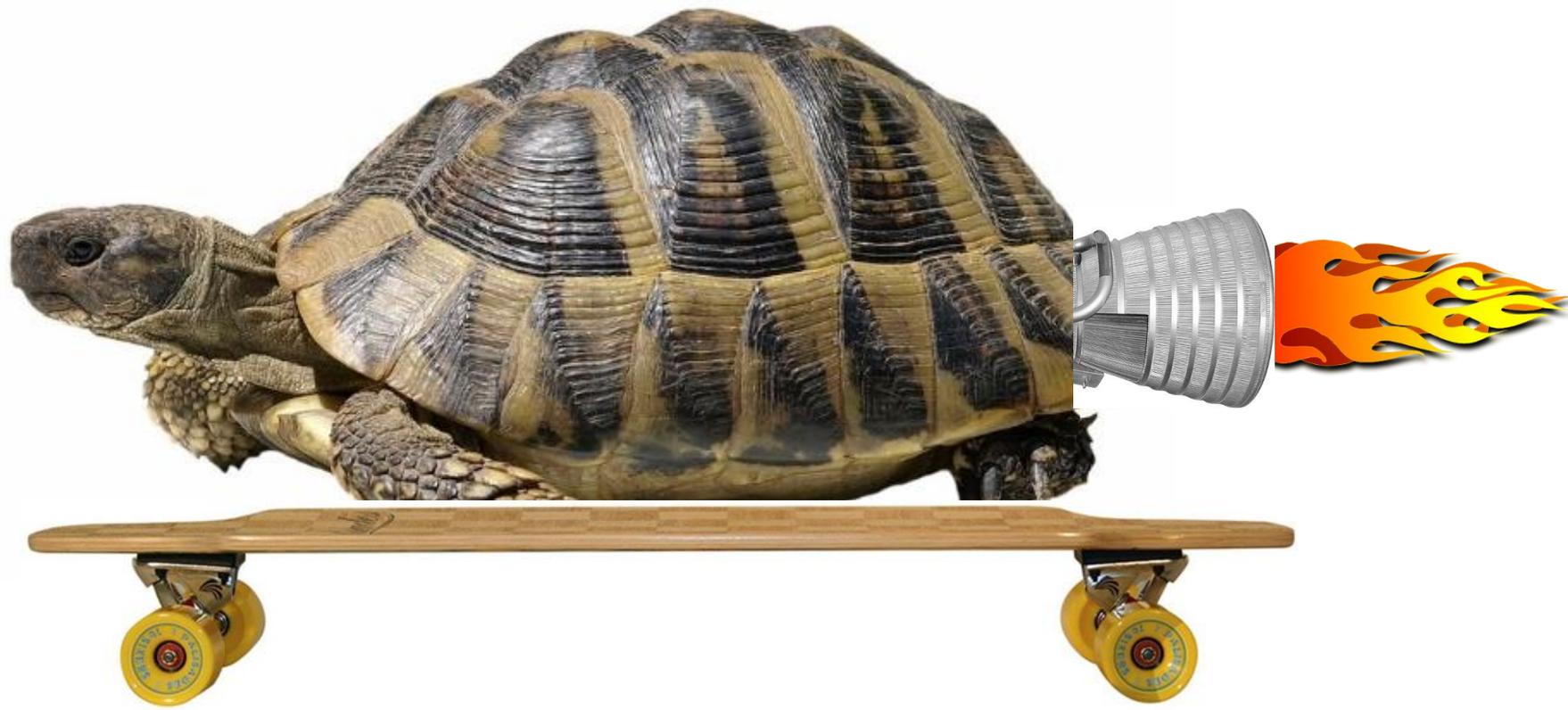
- Data becoming more mission-critical to profitability
- Role of data integrator and high-level analyzer will confer strategic advantage within industry's ecosystem
- Vantage point



“Once you turn something digital, it hops on to that Moore’s Law pace of change and accelerates.”

- Salim Ismail -- famous Silicon Valley technology strategist, and former head of Yahoo’s incubator





Thank you!
Questions?