The Next Perfect Storm

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The Convergence of

- the Internet of Things (IoT),
- Blockchain,
- Better Data Analytics, and
- Artificial Intelligence (AI)

THE SPEED OF BUSINESS HAS CHANGED

CORPORATE LIFE EXPECTANCY IS DECLINING *RAPIDLY*

Fortune 500's since 1957:

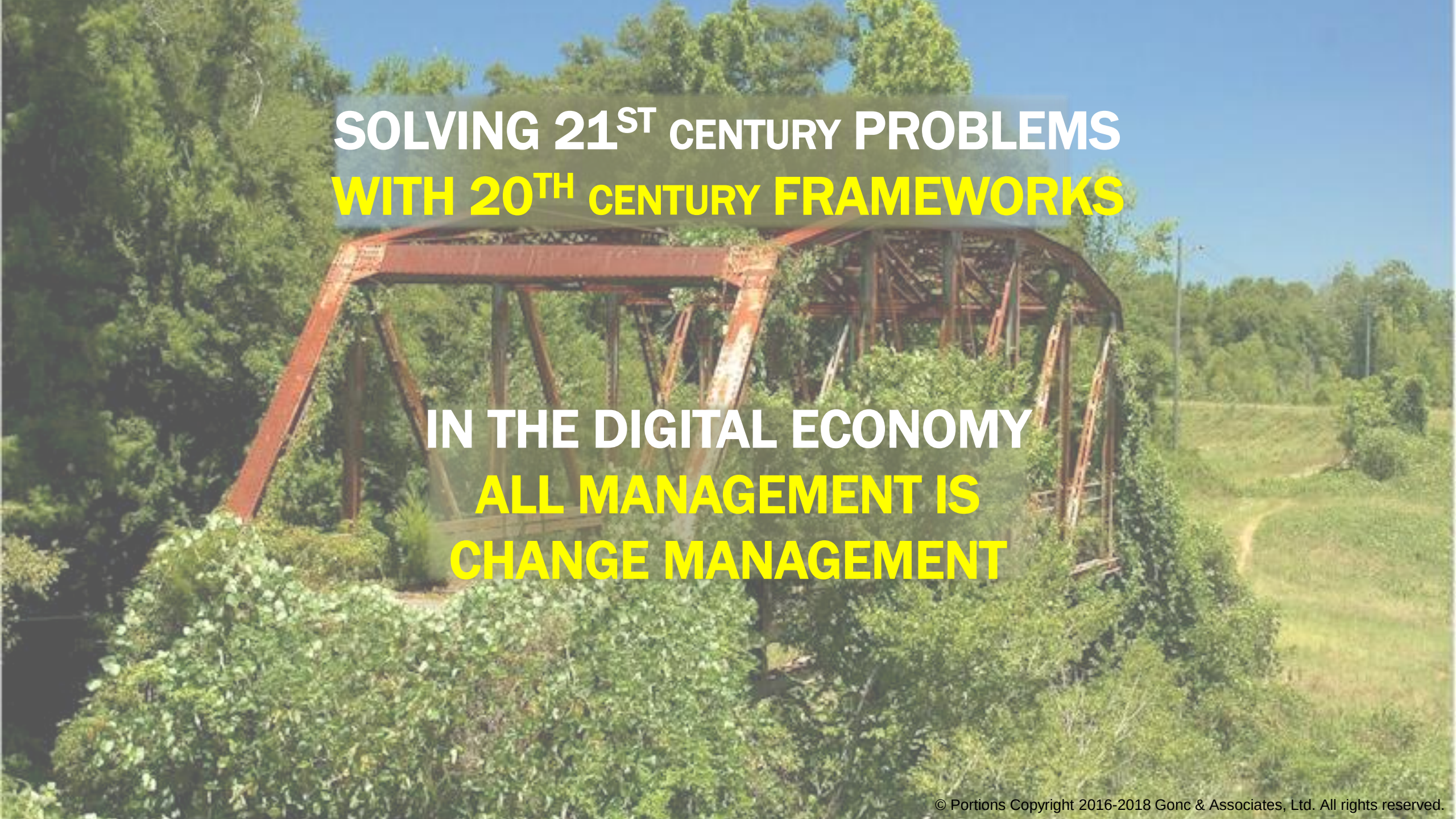
89% are gone, only 55 remain today.

Source: ***AEIdeas, Mark J. Perry, 2014***

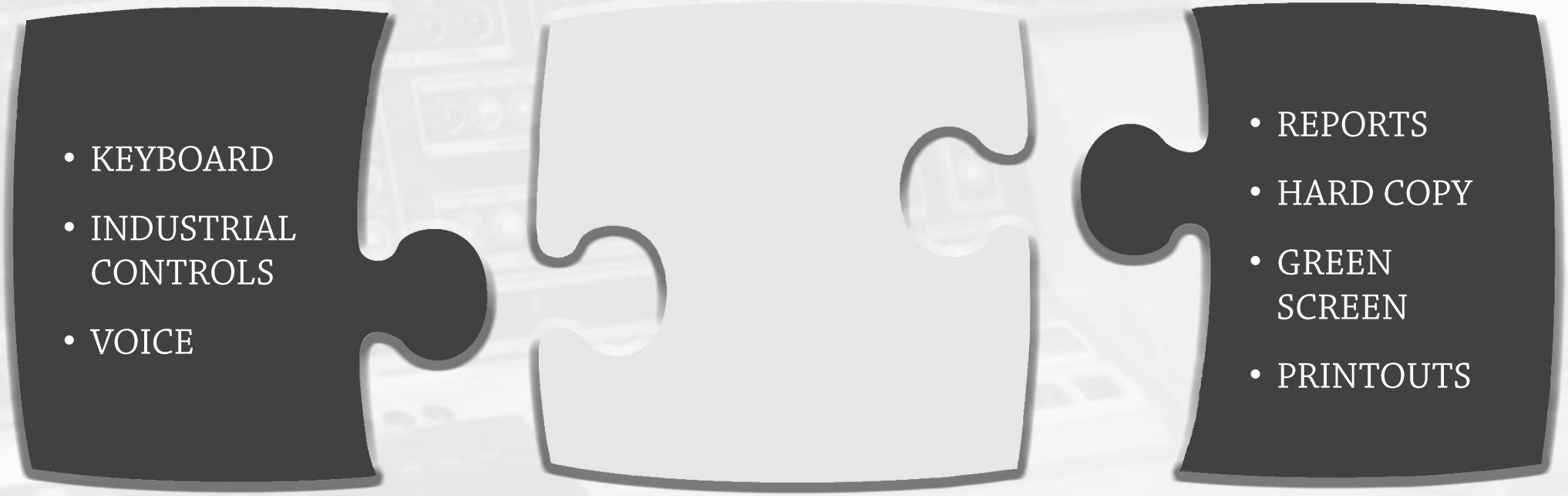
LESS TIME AT THE TOP

S&P 500 implied corporate lifetime: Today < 12 years.

Source: Foster & Kaplan, *Creative Destruction*



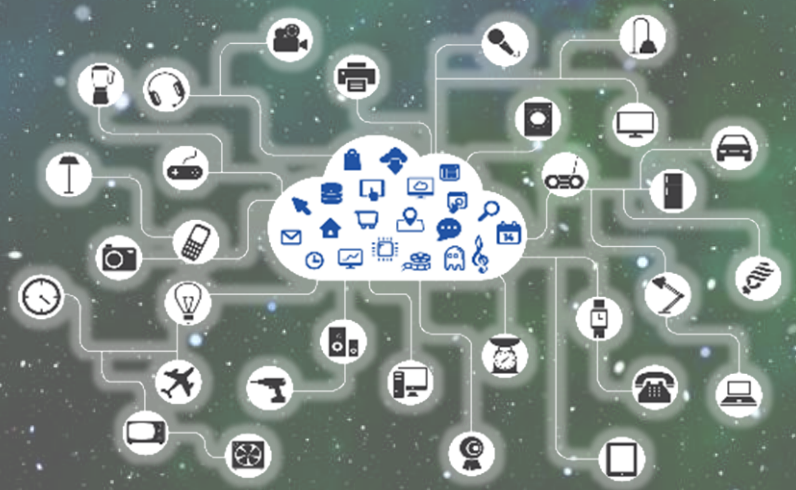
20th Century



NETWORK / TRANSPORT

21st Century

INTERNET OF THINGS

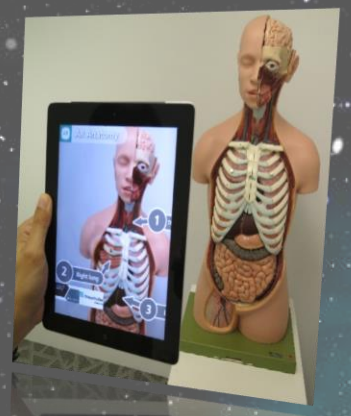


BETTER DATA ANALYTICS

MACHINE LEARNING

ARTIFICIAL INTELLIGENCE

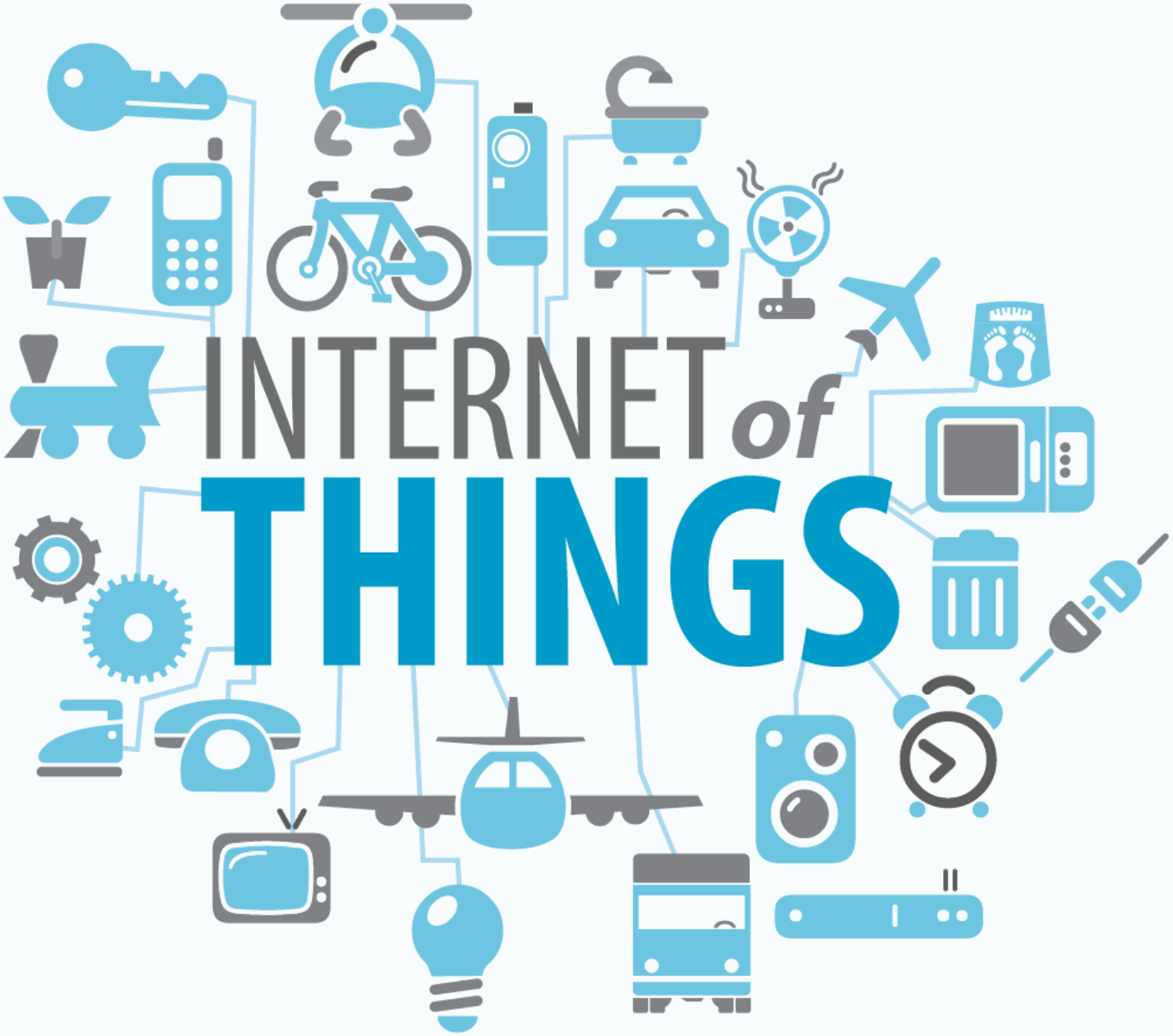
AUGMENTED REALITY



PERSONAL AVATAR

HOLOGRAMS

BLOCKCLOUD



How many Devices are we Talking About?

Number of Connected Devices

15.4 B — 2015

30.7 B — 2020

75.4 B — 2025

IHS Markit

Intel's projection is even bigger - 200 bilion connected devices by 2020

Number of B2B IoT Devices

2.5 B — 2017

5.4 B — 2020

Sparklabs

Number of Wearable Devices Sold

28.3 M — 2016

82.5 M — 2020

31% growth

IDC

Investment Banking

Risk Management

IoT

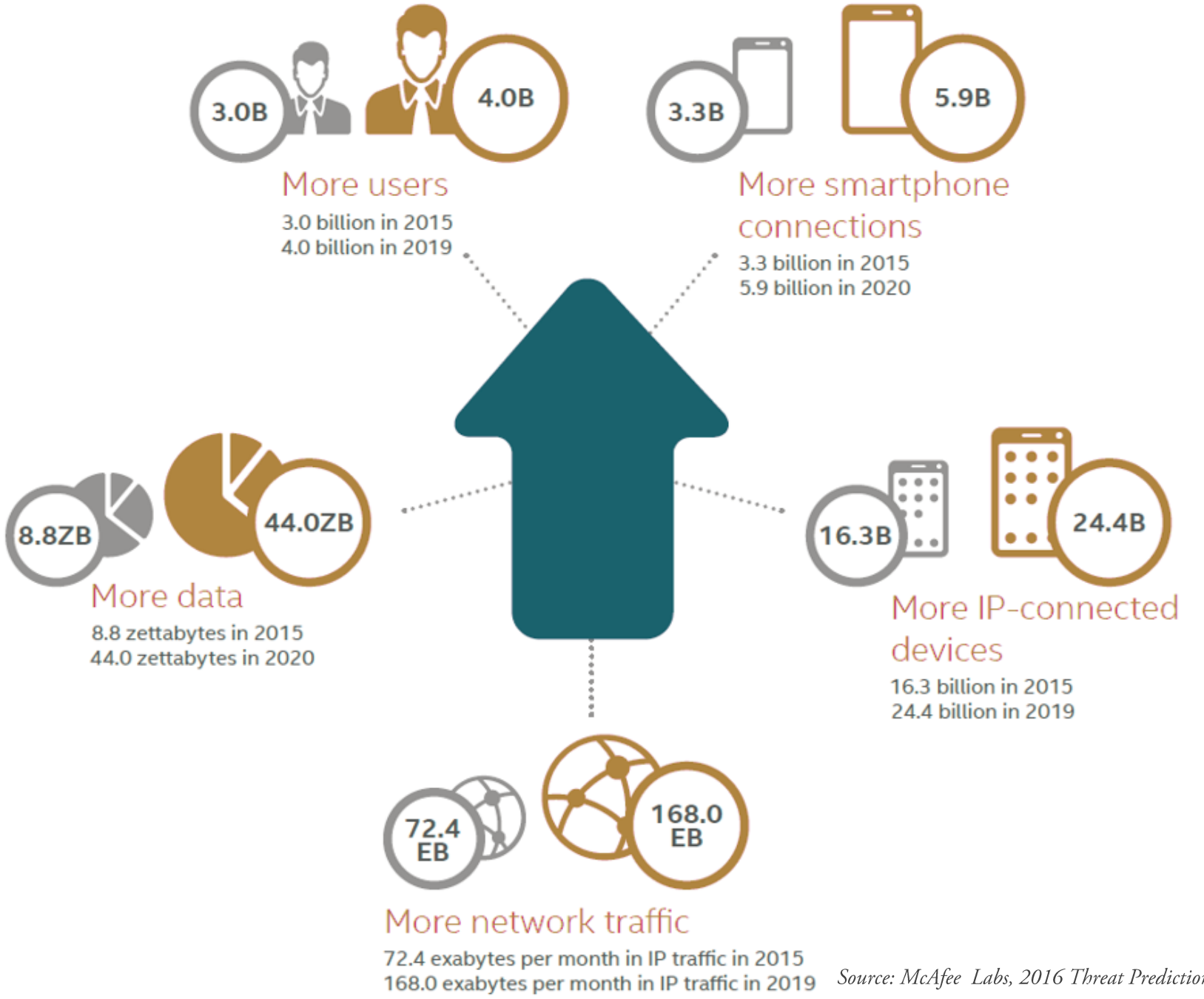
Blockchain

Top FinTech Companies to Watch

1. iCapital NETWORK
2. SHAPE SHIFT
3. symbiont
4. ripple

KENSHO	BLOCKCHAIN	AYASDI	blend
feedzai	Upstart	veem	BitFury
coinbase	Digital Reasoning	ELLEVEST	GUSTO
iex	Quandl	SYMPHONY	TransferWise

A Growing Attack Surface



Source: McAfee Labs, 2016 Threat Predictions.

What is a Blockchain?

"The blockchain is an incorruptible digital ledger of economic transactions that can be programmed to record not just financial transactions but virtually everything of value."

Don & Alex Tapscott,
authors Blockchain Revolution (2016)

Blockchain Currency

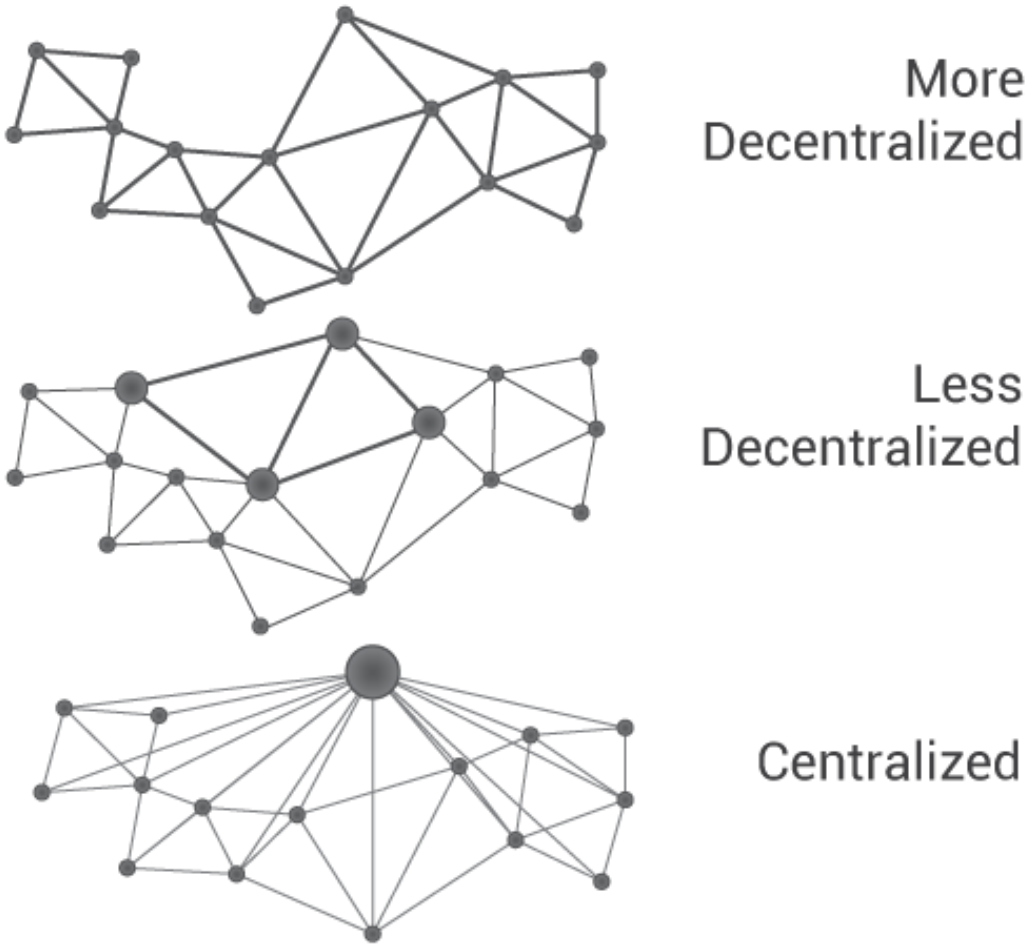
Bitcoin

- $10,716.40/ coin
- $289,555,042,815 Market Cap
- $14,642,800,000 Traded in 24 hrs
- Oct 2008; since Jan 2009

Ethereum

- $849.15 / coin
- $65,831,005,489 Market Cap
- $5,089,020,000 Traded in 24 hrs
- 2013; since Jul-Aug 2014

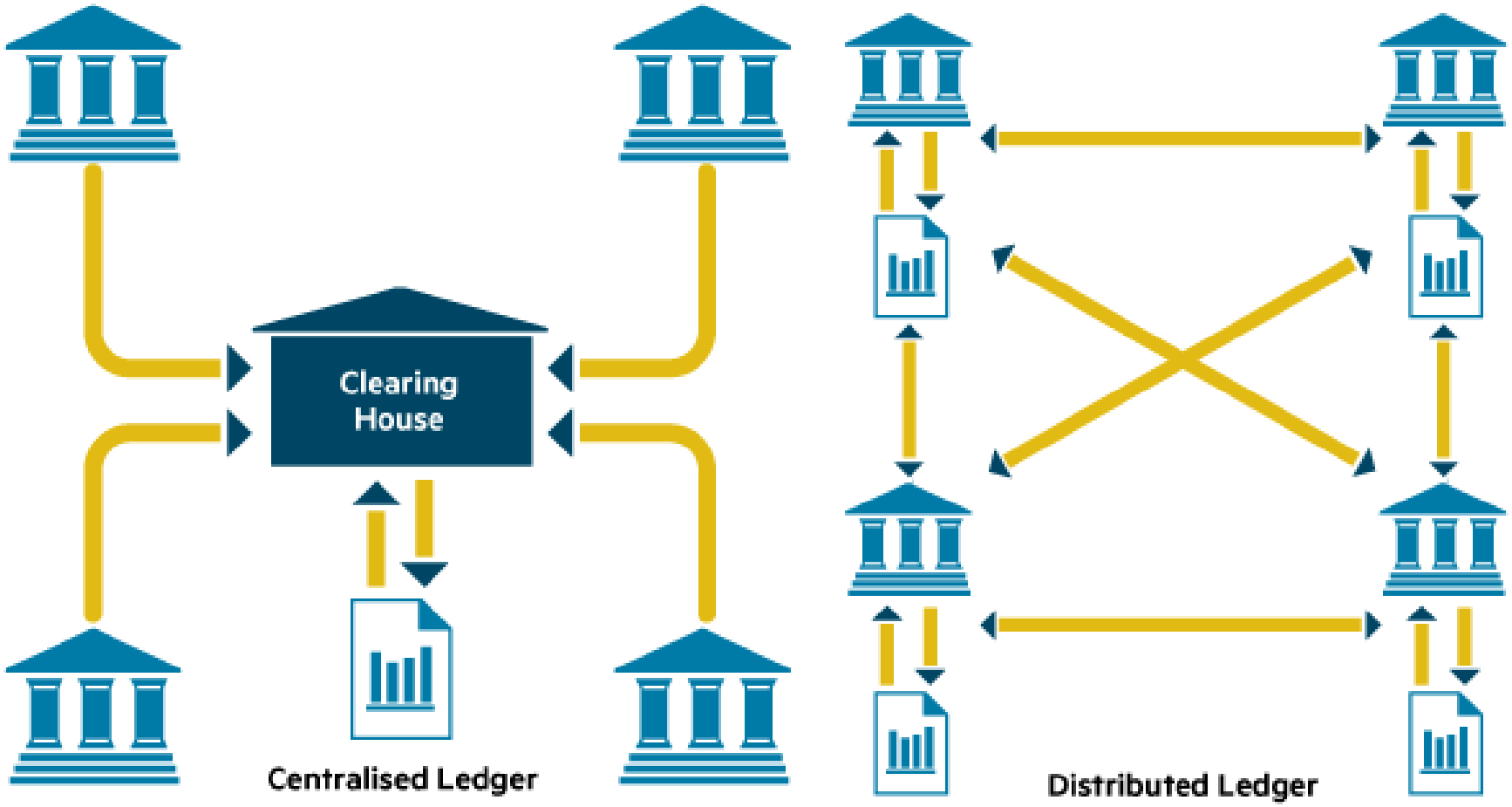
Three Main Peer-to-Peer Types



What is Blockchain?

Embedding distributed ledger technology

A distributed ledger is a network that records ownership through a shared registry



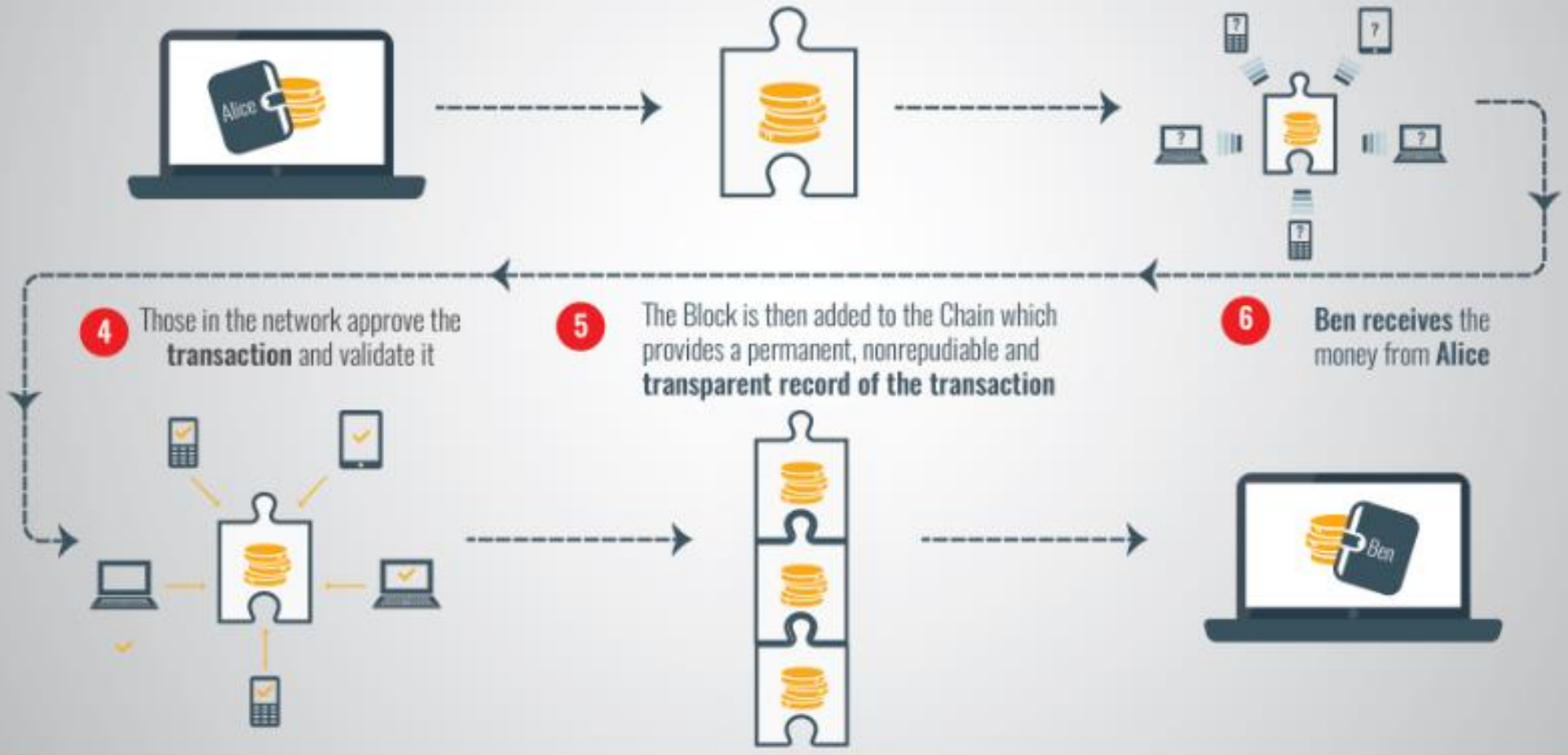
In contrast to today's networks, distributed ledgers eliminate the need for central authorities to certify ownership and clear transactions. They can be open, verifying anonymous actors in the network, or they can be closed and require actors in the network to be already identified. The best known existing use for the distributed ledger is the cryptocurrency Bitcoin

FT graphic. Source: Santander InnoVentures, Oliver Wyman & Anthemis Partners

HOW BLOCKCHAIN WORKS

"A Blockchain is a cloud based database shared by every participant in a given system, in the case of this exemplar, its a currency trade. The Blockchain contains the complete transaction of the cryptocurrency or other record keeping in other applications. Think of it as a cloud based peer to peer ledger."

1. **Alice** wants to **send** money to **Ben**
2. The first **Block** is created online and represents **the transaction**
3. This Block is **broadcast** to every party in the network
4. Those in the network approve the **transaction** and validate it
5. The Block is then added to the Chain which provides a permanent, nonrepudiable and **transparent record of the transaction**
6. **Ben receives** the money from **Alice**



Notes: Transactions are not valid until added to the Chain. Tampering is immediately evident.

The Blockchain is regarded as safe as everyone in the network has a copy. The Source of any discrepancies are usually evident immediately.

@PDForrest

Smart Contracts

Computerized transaction protocol that executes the terms of a contract. The general objectives are to satisfy common contractual conditions (such as payment terms, liens, confidentiality, and even enforcement), minimize exceptions both malicious and accidental, and minimize the need for trusted intermediaries.

Best example is the Ethereum DAO (decentralized autonomous organization), raising $150MM in June 2016, drained of $50 million due to a contract flaw.

Blockchain – Sectors to Watch

- **Financials**
- **Insurance**
- **Healthcare & Medical Devices**
- **Global Supply Chain**
  - **Shipping & Transportation**
  - **Suppliers**
- **Sports & Retail**
- **Agriculture**

Blockchain – Maersk

In 2014 Maersk found a single, simple shipment of refrigerated goods from East Africa to Europe can come into contact with:

- nearly 30 people and organizations,
- generating more than 200 different interactions, and
- 4” thick stack of paper along the way.

Hand-offs leading to missing and sometimes incomplete information, and delayed shipments.

BlockCloud

- Cloud as a data logistics platform
- Verifiable data supply chain
  - accountability, reliability, compliance, security, verifiability, auditability, acceptance of liability
- Secure supply chain that can be verified in real-time and when things go wrong, and someone to hold accountable."

"The 'very many blockchained' economy, is the new global market place. The blockcloud forms the foundation of an economic operating system.

— The Autonomist

Source: BlockCloud: Re-inventing Cloud with Blockchains, Mike Gault, 2017

BlockCloud

- Question answered:
  - what happened to the data, who accessed the data, where did it go, how is that data governed
  - verified by anyone who has access to the blockchain
  - the blockchain freezes the compute platform in time
  - users of the platform can verify the platform in real time
- Complete traceability
- Entities can be held responsible for their actions
- Regulators get to audit all processes
- Everyone involved can verify what happened when

Source: BlockCloud: Re-inventing Cloud with Blockchains, Mike Gault, 2017

Better Data Analytics

As the data pours in, how do you get better data analytics? Most companies miss assessing their systems through the lens of data quality:

1. Identify what questions you need to answer
2. Audit your business processes
3. Find Solutions for the Gaps

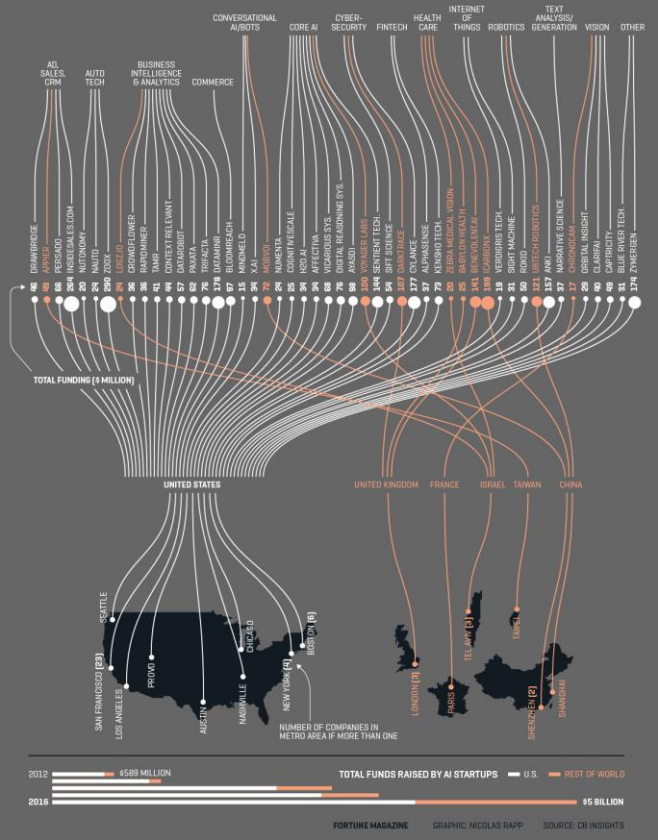
Artificial Intelligence

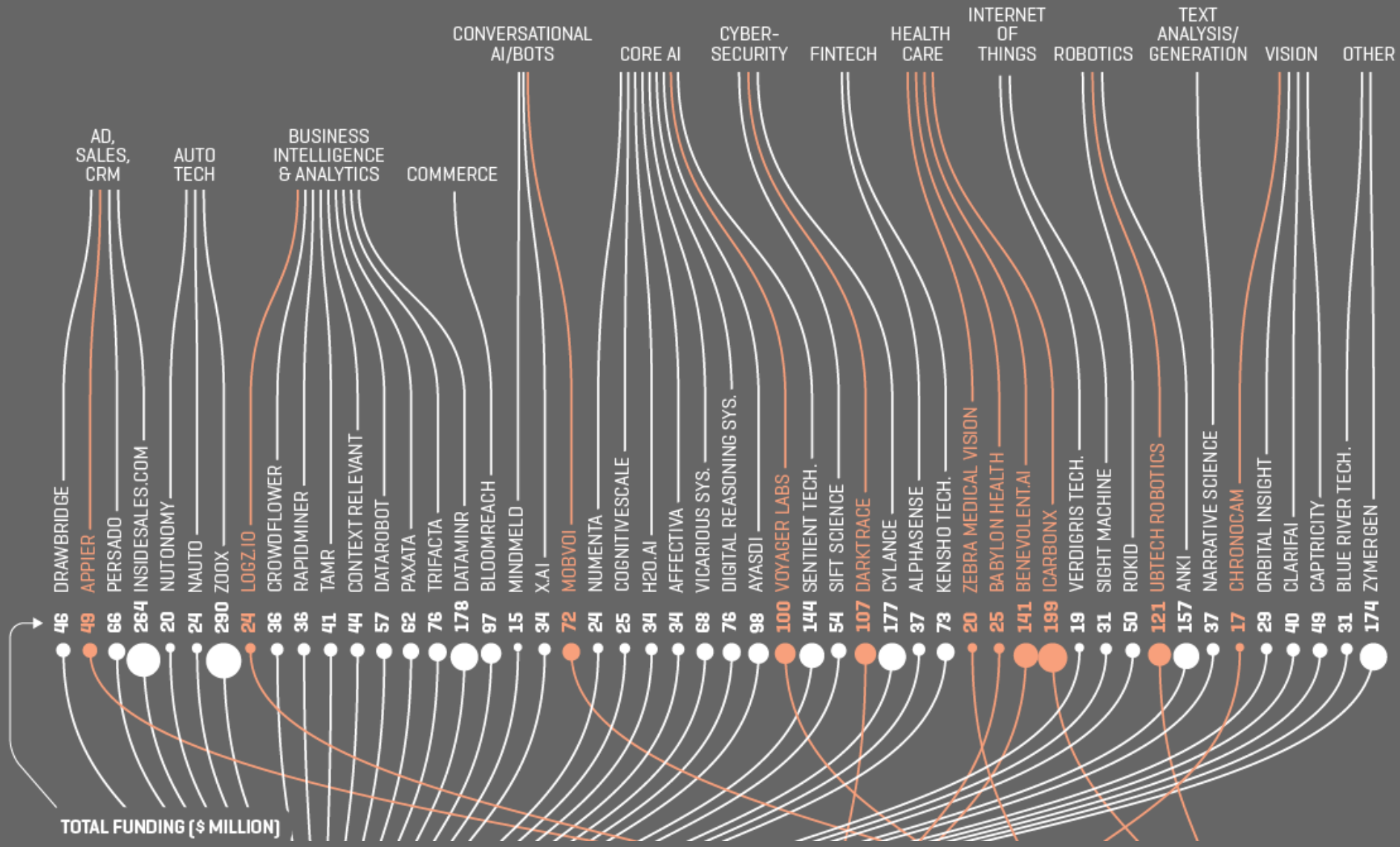
Companies to watch in hardware:

- Intel
- Nvidia
- AMD

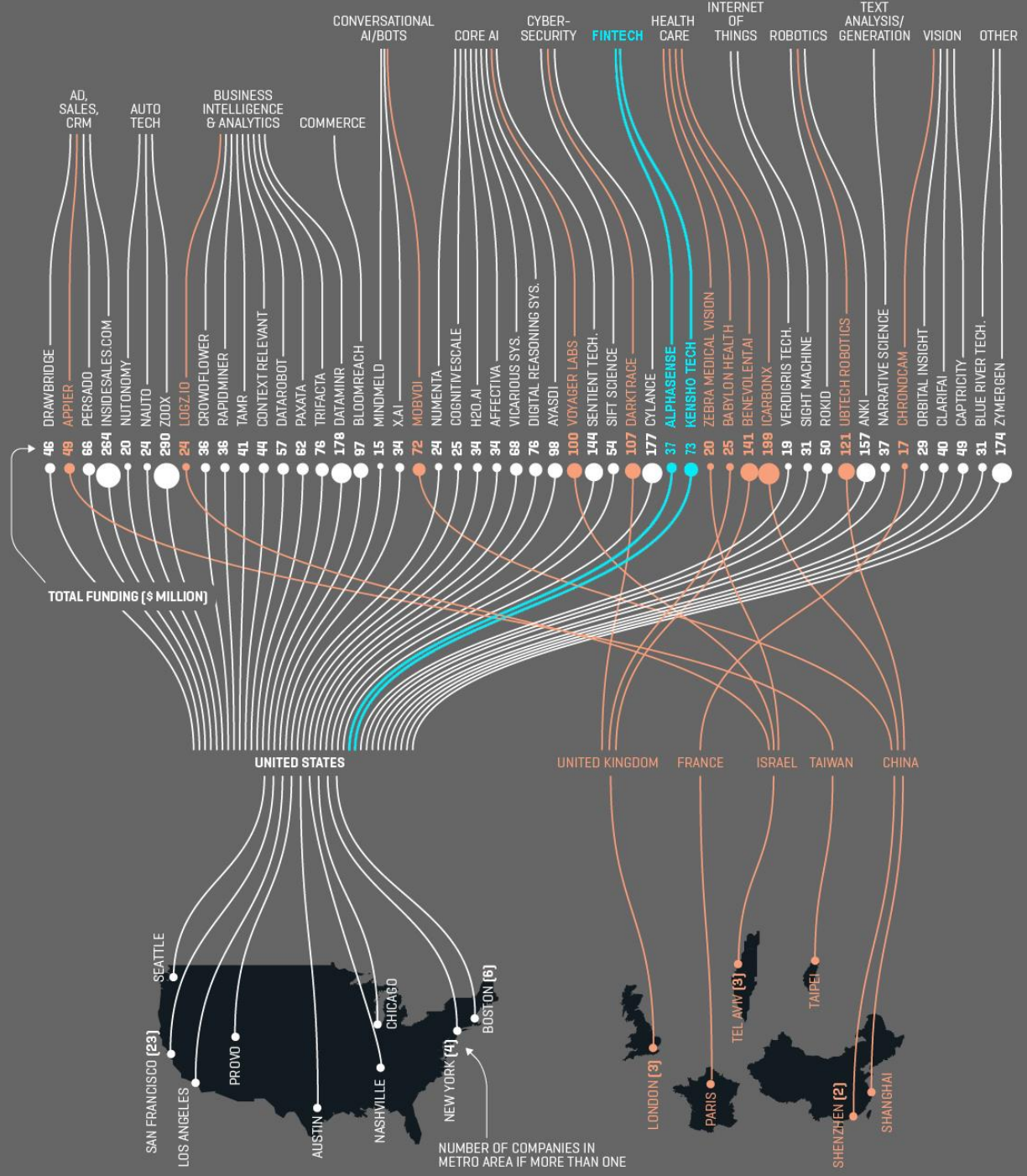
- CPU's from Intel and AMD: about 40% of the AI market share
- GPU's from Nvidia and AMD: about 54% of the AI market share
- Nvidia: about 1+ year ahead and short term sustainable

AI Startup Industries





FINTECH



Intersection of Cyber Security & Digital Transformation

Potential Areas at Higher Risk:

- For Business Processes – end-to-end value chain
- For IoT – each component and endpoint, manufacturers & integrators
- For Data Analytics – integrity, gaps, unkwown unknowns
- Third party Partners and Services
- Platform Integration Services (XaaS)
- Distribution Services (physical and virtual)

CyberSecurity as a Growth Enabler

Lack of a strong cyber security strategy can impact a company's innovation and growth, it hinders offerings of digital offerings and business models. The ultimate goal is to reduce risk and increase agility.

- Cisco Systems

Address Resilience

Operations

- Ship docks somewhere in the world every 15 minutes
- Unloads 10-20K containers

Resilience

- 4,000 servers
- 45,000 PCs
- 2,500 apps
- 10 days

CyberSecurity – 5 Top Attack Vectors

1. Phishing Attacks
2. Malware & Ransomware
3. Encryption Blind Spots
4. Cloud Threats
5. Employees

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CyberSecurity – 10 Critical Steps

1. Establish Information Security Teams
2. Manage Information Assets
3. Decide on Regulatory Compliance and Standards
4. Assess Threats, Vulnerabilities and Risks
5. Manage Risks

CyberSecurity – 10 Critical Steps

6. Create an Incident Management and Disaster Recovery Plan
7. Manage Third Parties
8. Implement Security Controls
9. Conduct Training
10. Conduct Audits

Gartner

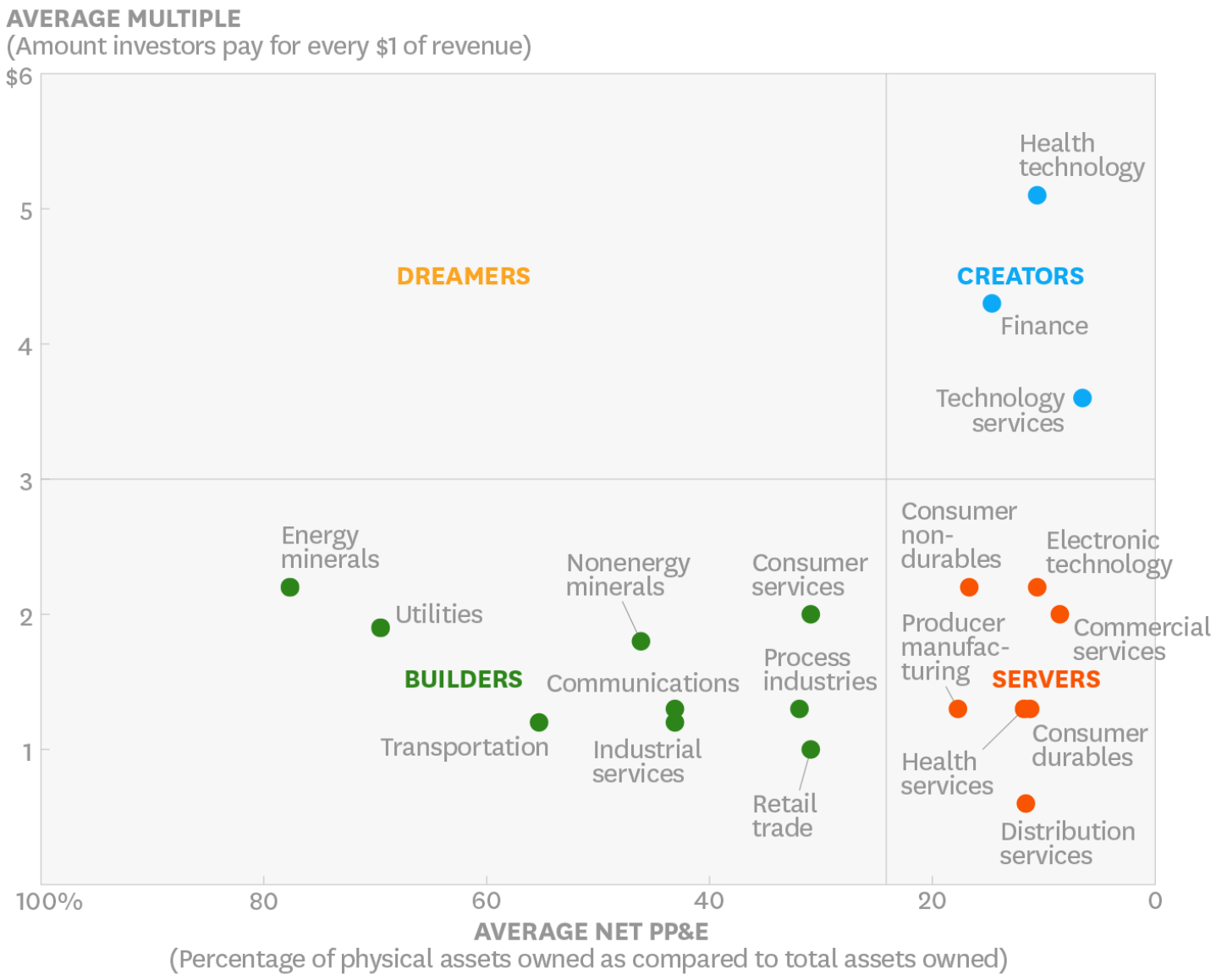
“By 2020, 60% of digital businesses will suffer major service failures due to the inability of security teams to manage digital risk.”

Journey to Zero

Less is More

How Investors Value Industries Based on Physical Assets

Companies with fewer physical assets (Net PP&E) are valued more highly.



SOURCE OPEN MATTERS, BASED ON DATA FROM THE 2015 S&P 1500 INDEX AND FACTSET

© HBR.ORG

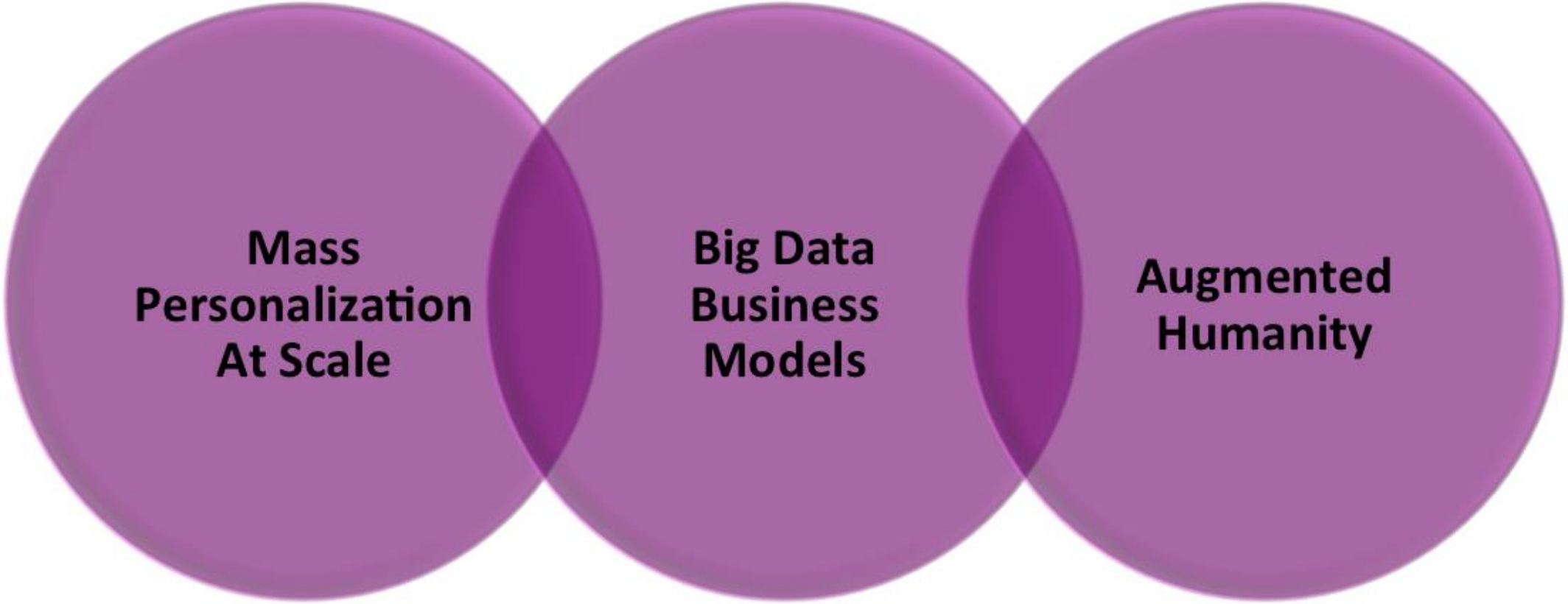
Journey to Zero

Zero infrastructure – "Anything-as-a-service" AaaS

- **Costs:** An ability to move from fixed to variable costs, and create a more competitive IT environment based on pay-per-use provisioning
- **Scalability/elasticity of supply:** Resources can be scaled based on user demand, and resource utilization becomes more transparent
- **Manageability:** Greater self-service and automation, with SaaS/PaaS replacing complex legacy solutions
- **Agility:** Faster time-to-market for new offerings, and an enhanced ability to pilot solutions and 'fail fast'
- **Mobility**: Greater alignment with new customer behavior, and enhanced ability to support mobile workforces


DIGITAL
TRANSFORMATION

3 Big Digital Mega Trends



3 Big Digital Mega Trends

1. Mass Personalization at Scale

Systems of engagement will move to experiential systems delivering massive contextual relevancy at scale. These systems will interface with us via human APIs, delivering customized products and services just-in-time using outcome driven designs.

Source: *Constellation Research, "Research Summary: Sneak Peeks from Constellation's Futurist Framework and 2014 Outlook on Digital Disruption", February 2014*

3 Big Digital Mega Trends

2. Bigger Better Data Business Models

The hyper connected Internet of Things (IoT) will bring a sensor-based and analytical ecosystem into our everyday lives. Devices will share environmental data with each other and the cloud, optimizing their operations based on aggregate and localized analytics. IoT will create a machine-to-machine meshed network that will interface with humanity, whether we ask it to or not.

Source: *Constellation Research, "Research Summary: Sneak Peeks from Constellation's Futurist Framework and 2014 Outlook on Digital Disruption", February 2014*

3 Big Digital Mega Trends

3. Augmented Humanity

The shift to cognitive computing represents a convergence of artificial intelligence, natural language processing, dynamic learning, and hypothesis generation - rendering vast quantities of data intelligible to help humans make better decisions. For machines, the ability to self-learn enables continuous reprogramming. The sum of our collective insights and data can be served up at the right time in the right context.

Source: *Constellation Research, "Research Summary: Sneak Peeks from Constellation's Futurist Framework and 2014 Outlook on Digital Disruption", February 2014*

Obstacles to Change

Jane McConell, renowned author, speaker and founder of NetStrategy JMC, has conducted global annual surveys on the internal digital work environments of organizations **since 2006.**

- **Slow or stalled decision-making** caused by competing priorities, internal politics, or attempting to reach consensus
- **Inability to prove business value** of digital through traditional ROI calculations, resulting in lack of senior management sponsorship

Obstacles to Change

- **Too much focus on technology** rather than willingness to address deep change and modify how employees work
- **Lack of understanding operational issues** at the decision-making level and difficulties in practical applications
- **Fear of losing control** by management or central functions

According to Jane, "The toughest challenge in digital transformation is not to define a strategy, but rather to make it tangible and actionable."

Recipe for Transformation

Taken together, these **four cultural** characteristics provide the foundational ingredients for a super-charged recipe to go from **"doing digital"** to **"going digital"**:

- **Value experimentation and speed.** It's not just about the agility of the organizational structure, but empowering employees, incentivizing them, and giving them the authority to enact and drive change.
- **Embrace risk.** Risk-taking is built into the fabric of how these organizations manage. They emphasize innovation and don't get upset when something doesn't work out. 87% invest in innovation at the early stages.

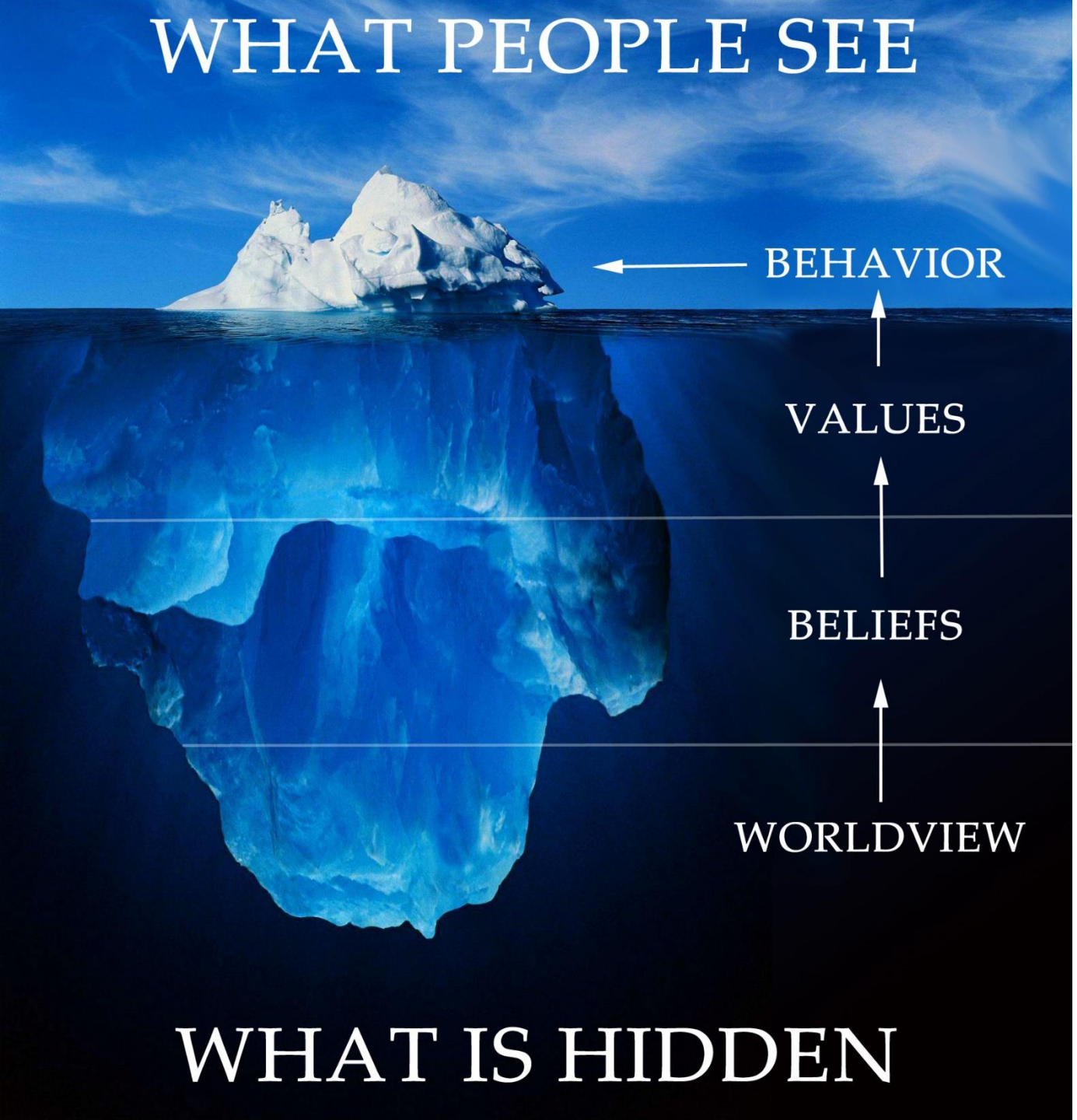
Source: *Constellation Research, "Research Summary: Sneak Peeks from Constellation's Futurist Framework and 2014 Outlook on Digital Disruption", February 2014*

Recipe for Transformation

- **Organize for collaboration.** These organizations moved from vertical departments to a project-based approach. Think distributed, not hierarchical.

- **Make data-driven decisions.** These companies set very clear goals and measurable objectives, and then communicated them clearly. They get very specific and tactical on what they want to achieve and how to measure success.

Source: *Constellation Research, "Research Summary: Sneak Peeks from Constellation's Futurist Framework and 2014 Outlook on Digital Disruption", February 2014*



IN THE DIGITAL ECONOMY, CULTURE EATS STRATEGY FOR BREAKFAST, LUNCH & DINNER

WHERE WILL YOU BE?

“In the next 10 years, 40% of the Fortune 500 companies will be gone”

Source: ***John M. Olin, 2015***
School of Business at Washington University

Thank You

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