delaware

Becoming Anti-Fragile: How to Thrive in Times of Uncertainty.

Webinar 2: The Age of Fragility. Why Companies Struggle with Exponential Technological Change

Sean Culey (SCOR-P, FCILT)

- Visiting Fellow (Supply Chain) – Cranfield School of Management
- Head of Value Chain – The MTC
- Author: '*Transition Point: From Steam to the Singularity*'

Webinar 1:
Living Through The Transition Point:
Understanding Disruption & Exponential Technological Change

Tuesday 16th April: 11:00 – 11:45am

Why is everything so disruptive right now?

Webinar 2:
The Age of Fragility:
Why Companies Struggle with Exponential Technological Change

Thursday 23rd May: 11:00 – 11:45am

Why are companies struggling to adapt to this disruption?

Webinar 3:
Becoming Anti-Fragile:
Learning to thrive in Disruptive Times

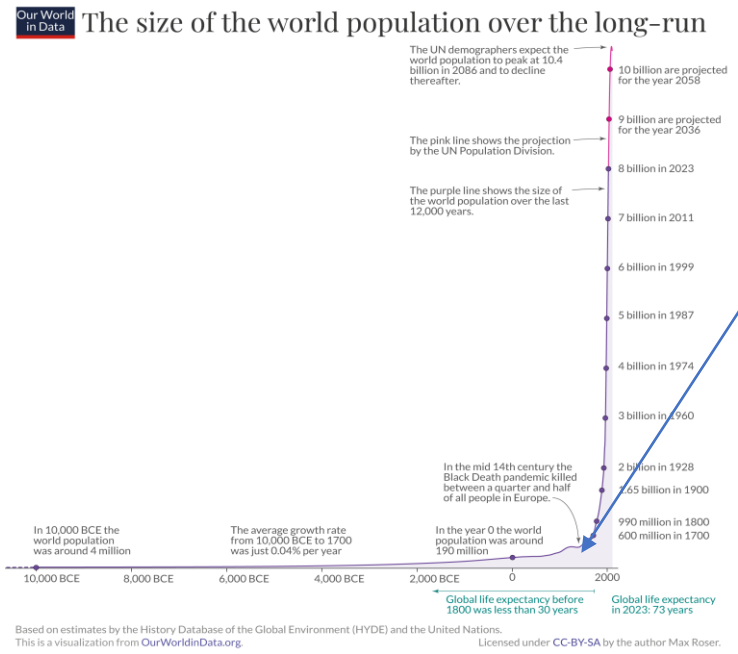
Thursday 27th June: 11:00 – 11:45am

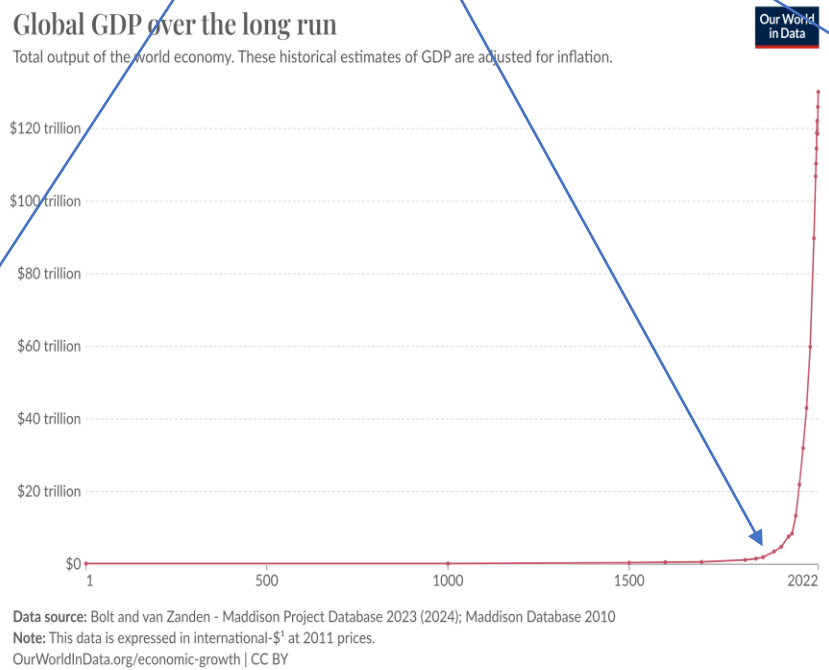
What can companies do to not just survive, but thrive?

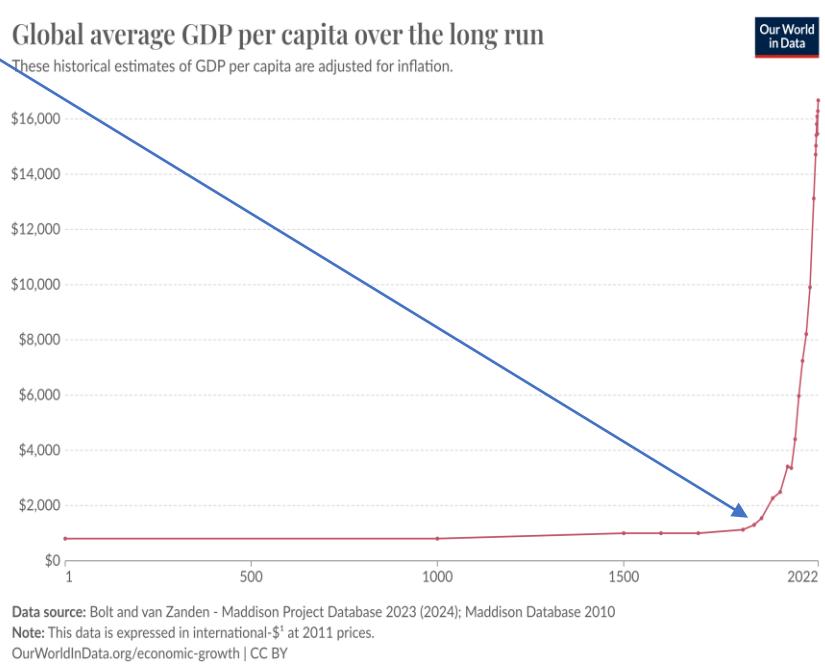
Humanity goes from Linear to Exponential…

It took 200,000 years for the human population to reach 1 Billion, but only 200 years to reach 7 billion.

What happened here?



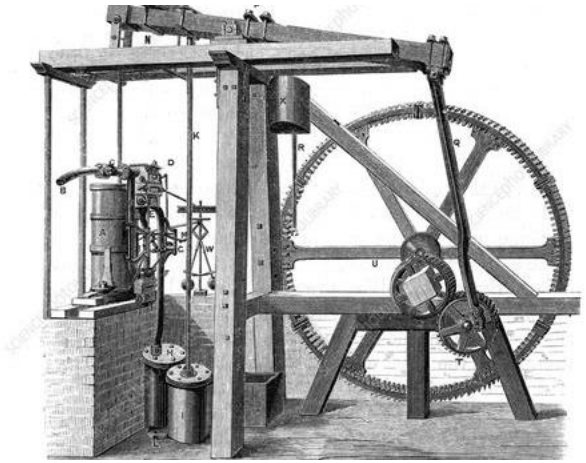




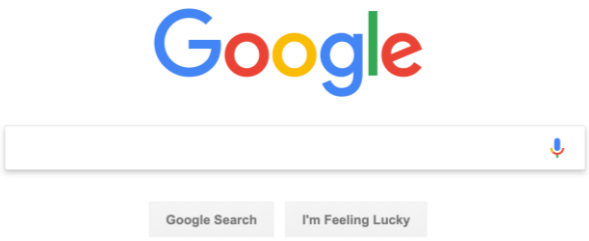
Exponential growth in the number of people…

Exponential growth in wealth…

Exponential growth in wealth per person…



From steam engines…

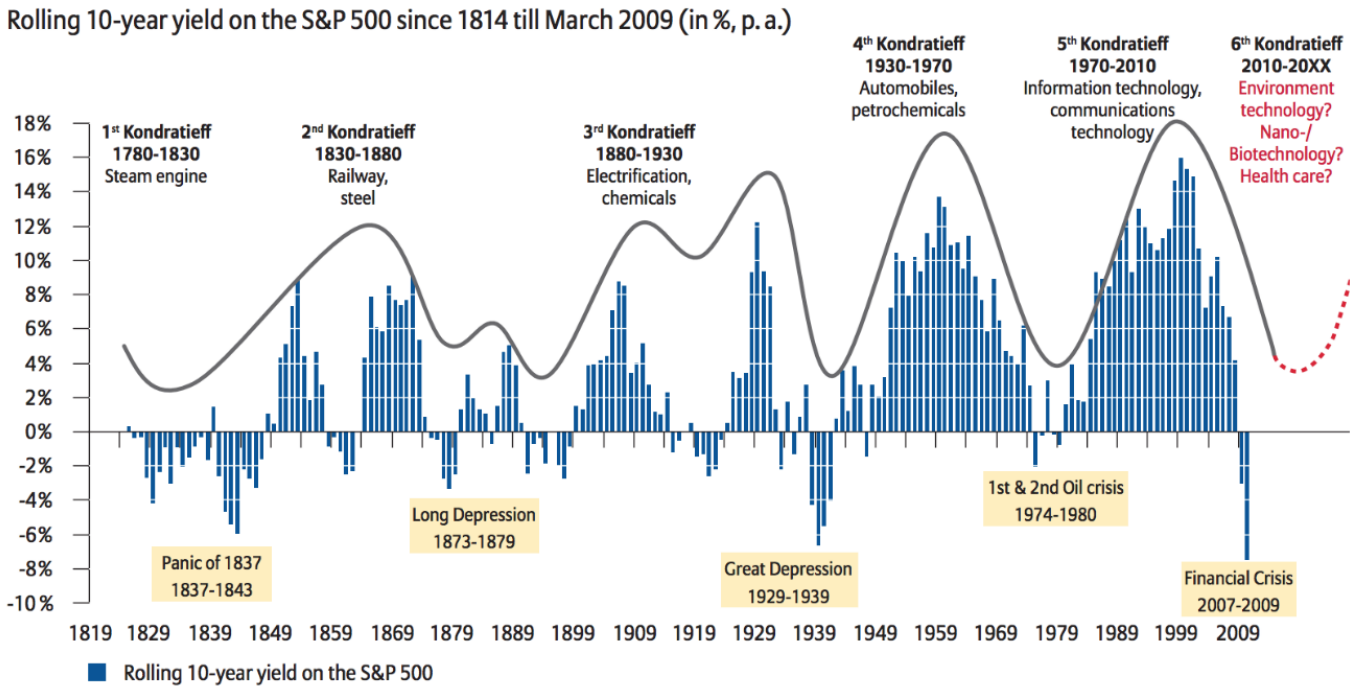


…to search engines.

Waves of exponential change…

Five waves of Creative Destruction took us from the Industrial Revolution to the Information Revolution…

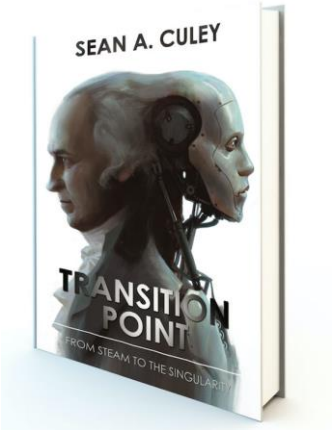
We are now in the Sixth Wave…



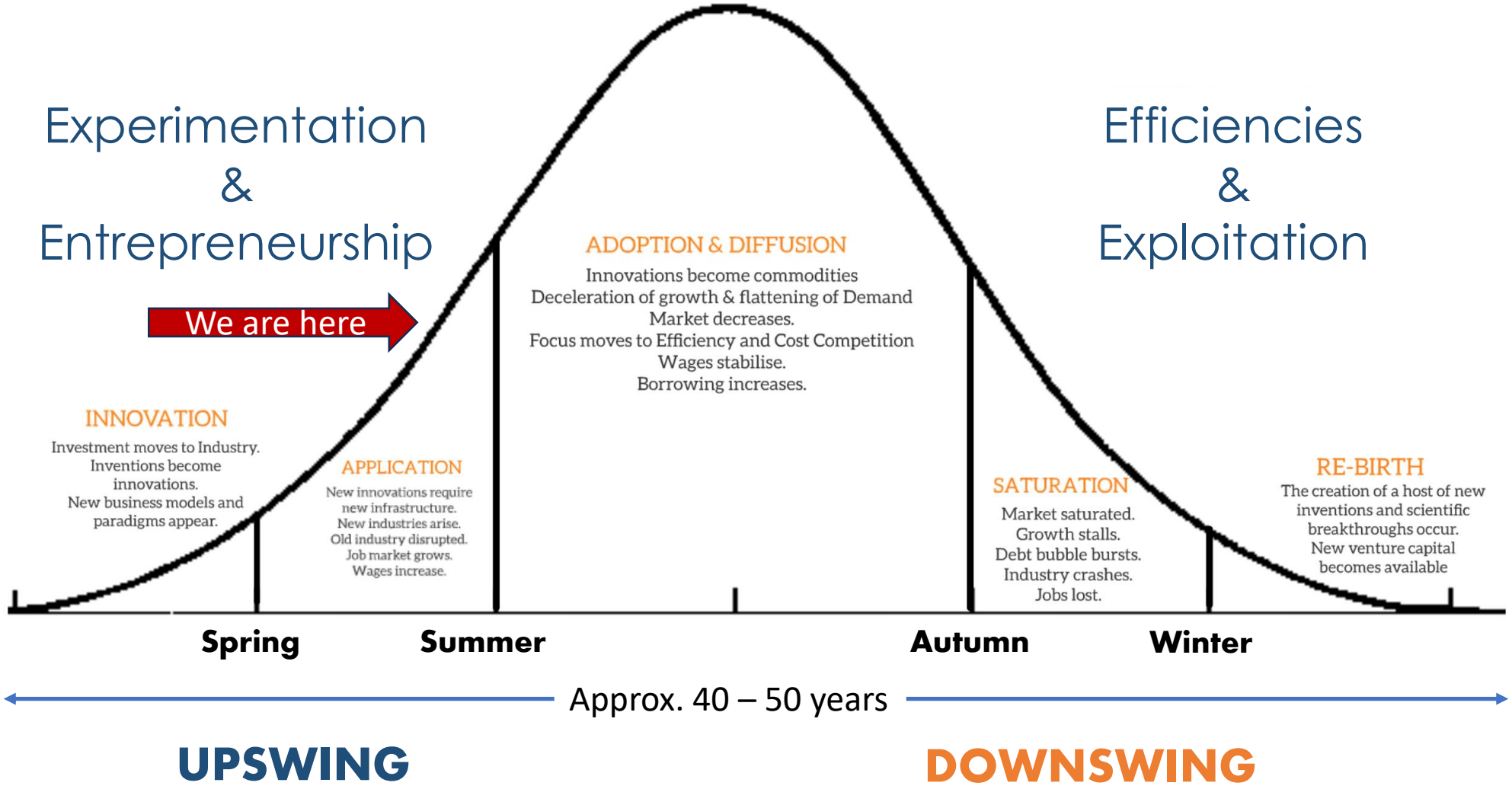
Source: Datastream; Illustration: Allianz Global Investors Capital Market Analysis

	Wave One	Wave Two	Wave 3	Wave 4	Wave 5
	First Industrial Revolution	Age of Steam & Rail	Second Industrial Revolution	The Age of the Automobile	The Computer Age
Time Period	1760 - 1820	1820-1870	1870-1914	1908 - 1970	1971-2008
Length	60 years	50 years	44 years	62 years (2 World Wars)	37 years
Power Source	Steam Engine + Coal	Steam	Electricity	Electricity, petrochemicals	Digital communications
Transport Mechanism	Canals, Sailing ships	Rail, Steam Ships	Rail (especially US), Bicycle, Transatlantic shipping	Road, Rail, Plane, Ships	Road, Plane, Shipping containers
Communication Mechanism	Printing press	Telegraph	Telephone	Radio, TV	TV, Video, mobile telephony, Internet
Industry	Coal Mining, Cotton, Pottery	Steam powered factories, iron bridges and constructions	Steel, Heavy Engineering (civil, chemical, electrical and naval)	Mass produced Automobile, Consumer White Goods	Computer hardware and software, smart phones, e-commerce, service industries

Waves of Creative Destruction…
Understand the cause, not just the effect.



"I study history because I am interested in the future."
— Peter Rachleff

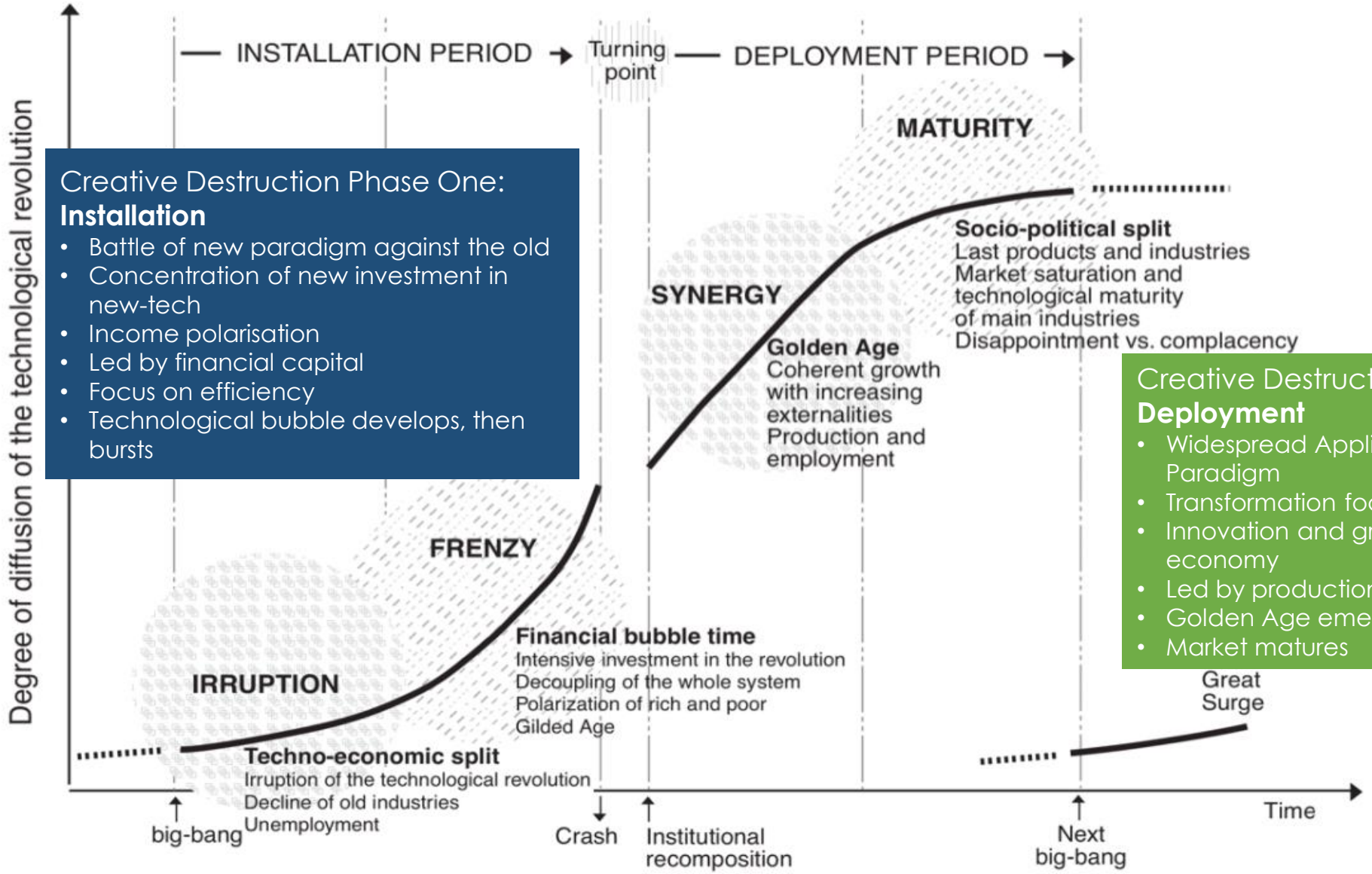


The Two Phases of Creative Destruction in a Wave's Upswing

Phase One: Improve	Phase Two: Transform
• New inventions materialise. • Used primarily to do old things with new tools. • Focus on improving the efficiency of processes.	• Inventions turn into innovations and are industrialised. • Figure out how to use these new tools to do new things. • Focus on reimaging how things are done.

Spring 'Installation', and Summer 'Deployment' period:
An 'Invention' phase, and an Innovation & 'Industrialisation' phase.

Carlota Perez: Technological Surge Cycle



Creative Destruction Phase One:
Installation

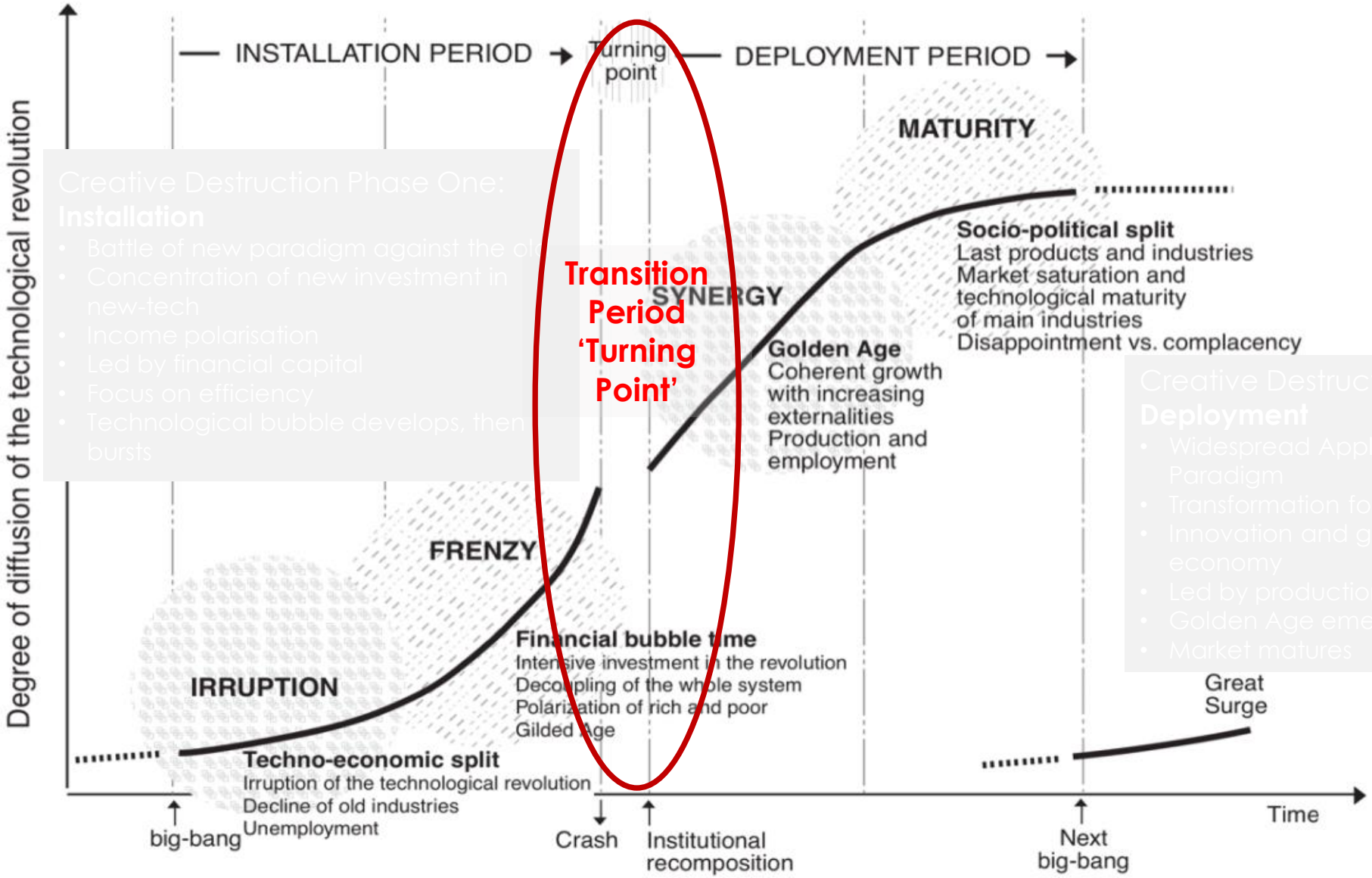
- Battle of new paradigm against the old
- Concentration of new investment in new-tech
- Income polarisation
- Led by financial capital
- Focus on efficiency
- Technological bubble develops, then bursts

Creative Destruction Phase Two:
Deployment

- Widespread Application of New Paradigm
- Transformation focus
- Innovation and growth across the economy
- Led by production capital
- Golden Age emerges
- Market matures

We are currently in the disruptive Transition Period or 'Turning Point'…

Carlota Perez: Technological Surge Cycle



The Transition Period is a time of great fragility…

Our personal finances are **fragile**.

Our supply chains are **fragile**.

Our energy and food supplies are **fragile**.

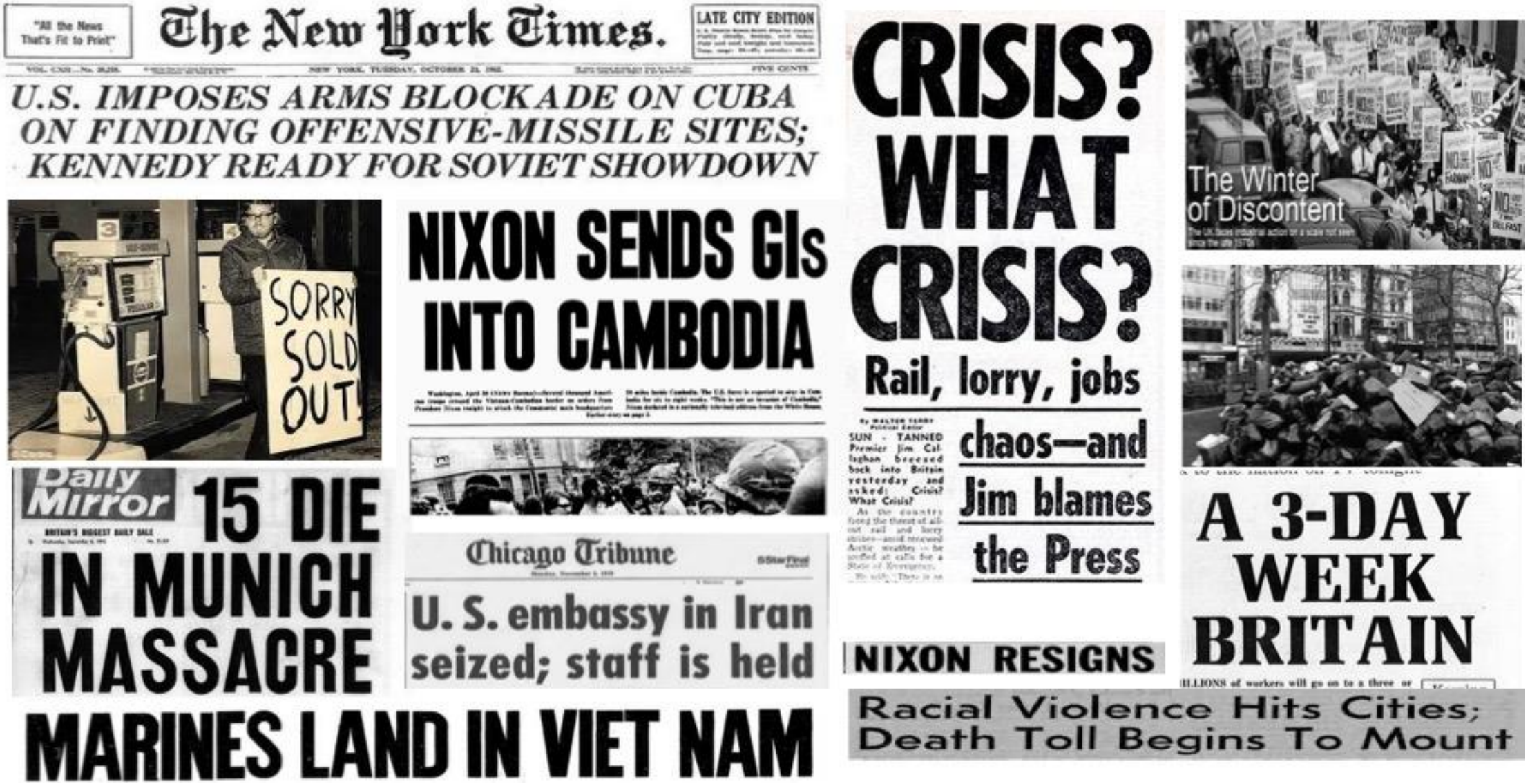
Our economies are **fragile**.

Our peace is **fragile**.

Our democracies are **fragile**.

Our ecosystem is **fragile**.

Just because the chaos and disruption of the upswing is new to us, doesn't mean it is new…



Phase Two: Transformation Time Again

…what paradigm shifts will this phase bring forth?

Phase One: Improve

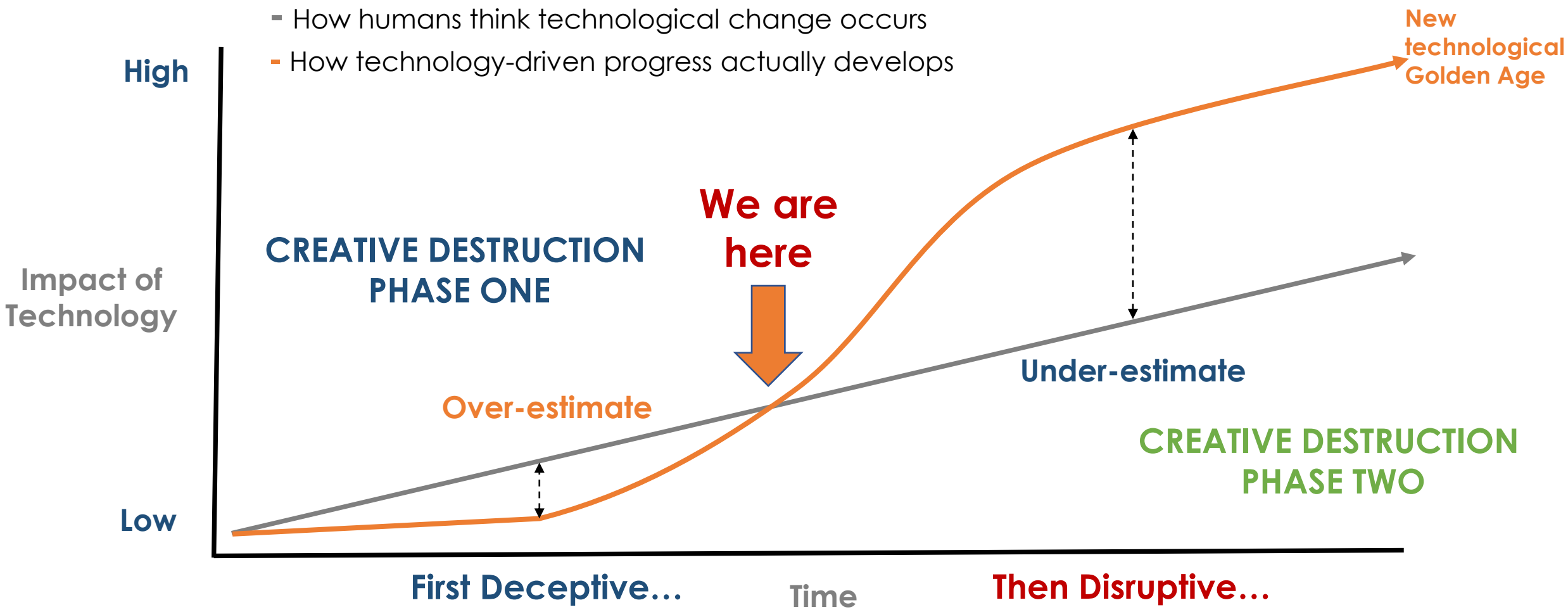
- New inventions materialise.
- Used primarily to do old things with new tools.
- Focus on improving the efficiency of processes.

Phase Two: Transform

- Inventions turn into innovations and are industrialised.
- Figure out how to use these new tools to do new things.
- Focus on reimaging how things are done.

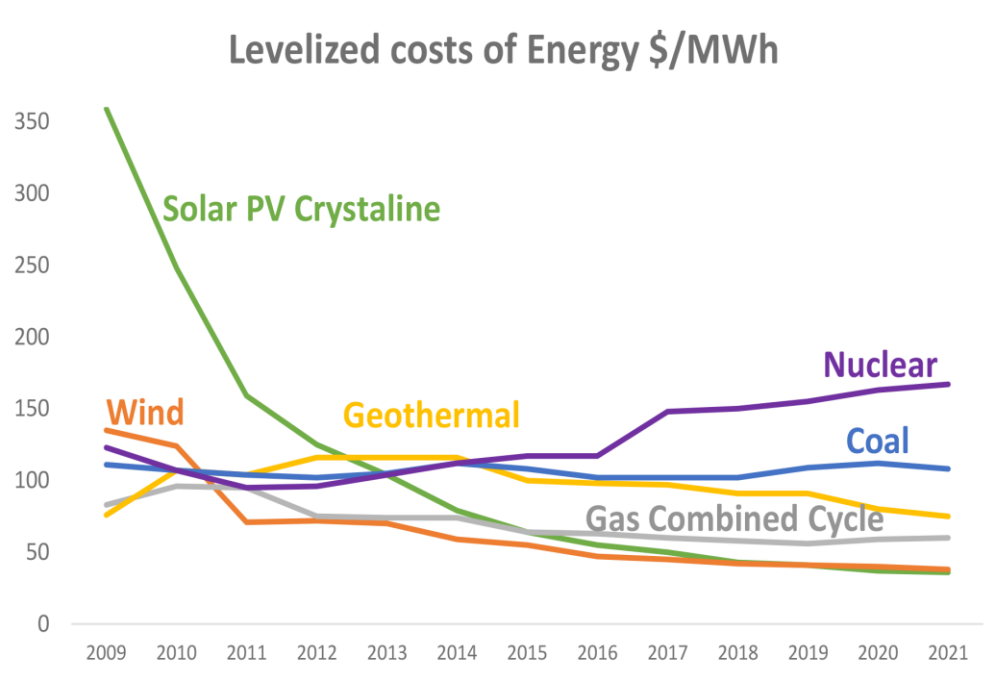
Amara's Law:

"We tend to over-estimate the impact of technology in the short-term, and under-estimate it in the long-term."

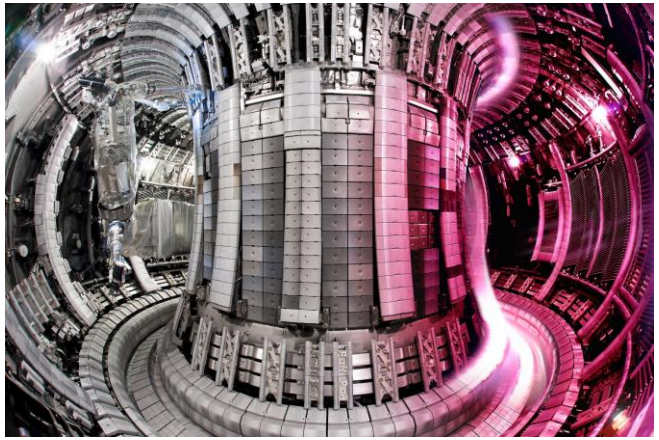


Think things are disruptive now? You haven't seen anything yet…

Sixth Wave Power:
Phase One. Improvement.



Sixth Wave Power:
Phase Two: Transformation



Scientists Report Major Progress On Tokamak Fusion Effort

By Brian Westenhaus - Sep 13, 2022, 12:30 PM CDT

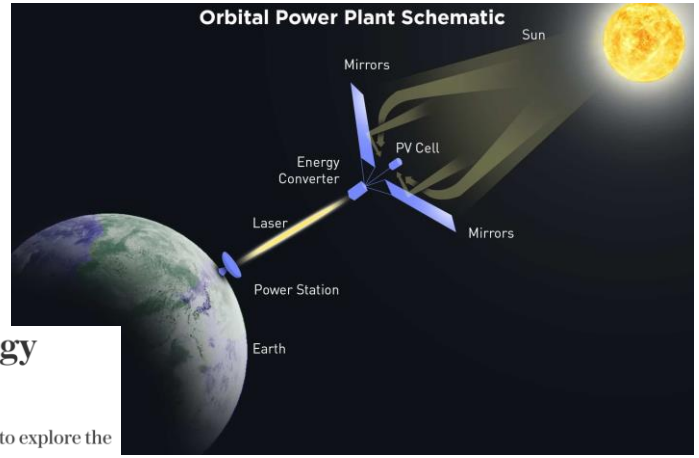
The First Small Modular Nuclear Reactor Was Just Approved by US Regulators

Scientists Just Made Hydrogen Fuel With Nothing But Air and Solar Power

MTC joins Space Energy Initiative for in-orbit solar

Energy crisis lifeline as Government backs plans to launch UK's first space power station

Solar panels will wirelessly beam signals back down to Earth to generate power for clean electricity in a project which could come online BY 2035.

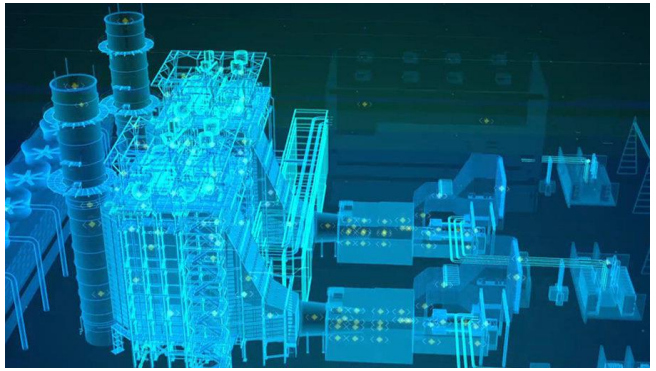


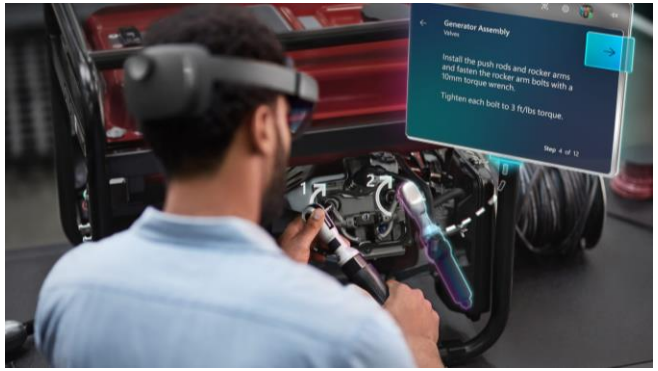
Space-based solar power is viable energy solution, says Government

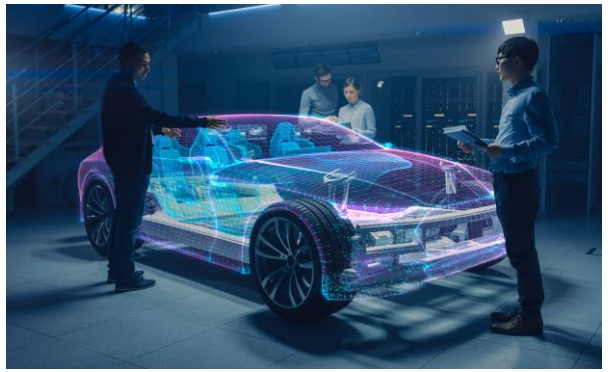
UK Space Energy Initiative is teaming up with aerospace company Airbus to explore the possibility of beaming solar energy back to Earth

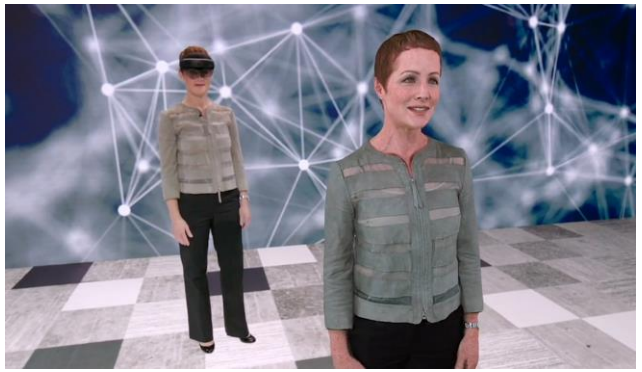
Sixth Wave Communication:
Phase One. Improvement.

Sixth Wave Communication:
Phase Two: Transformation



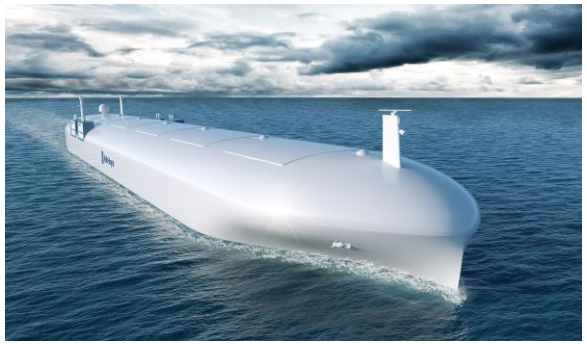




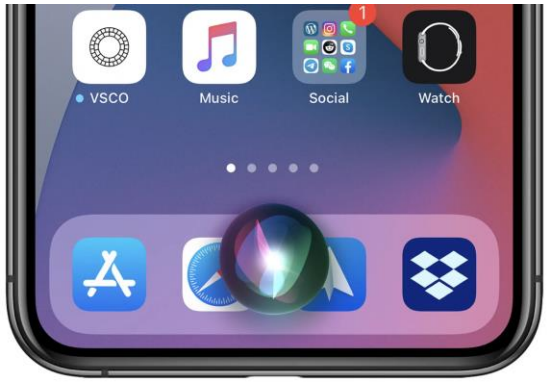


Sixth Wave Transportation:
Phase One. Improvement.

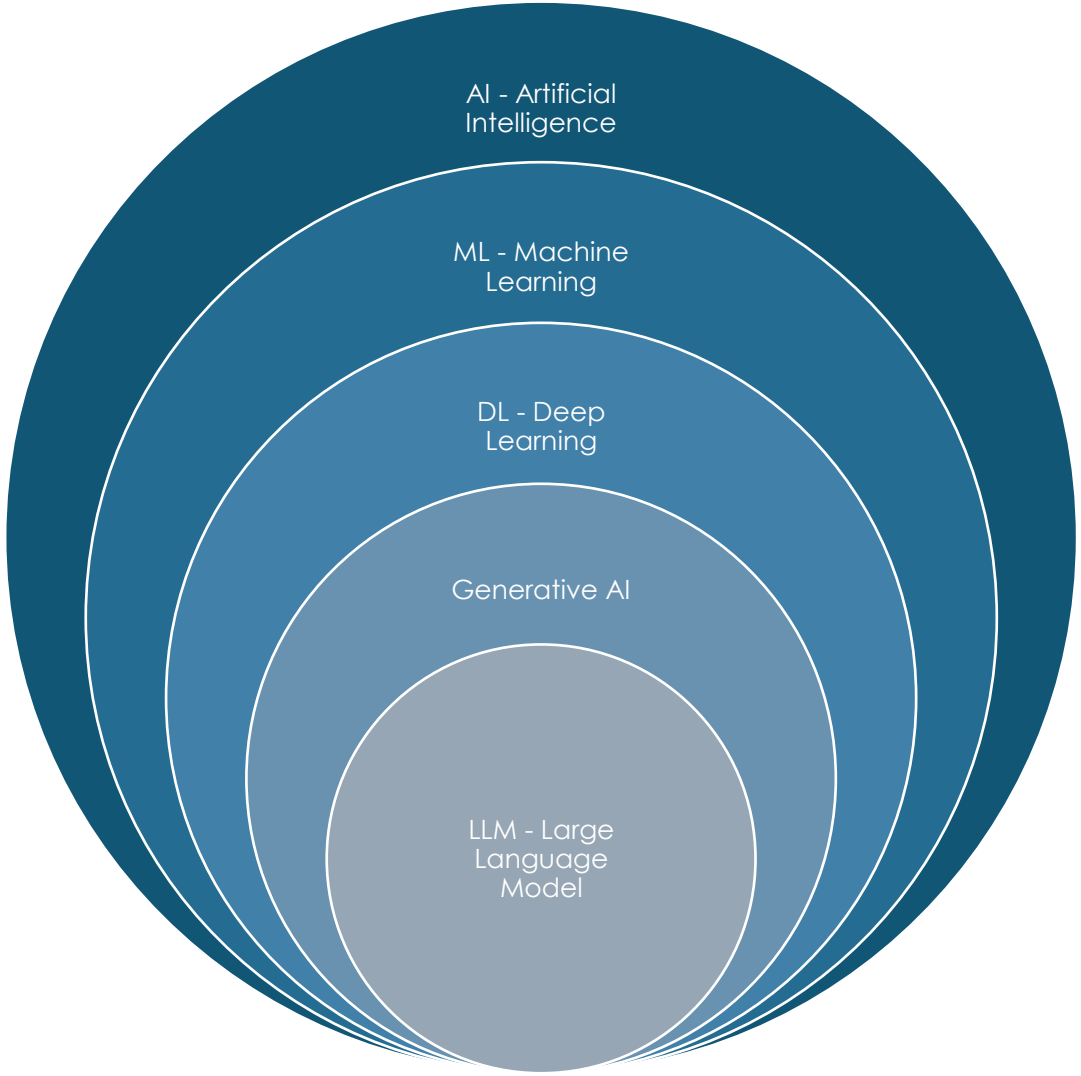
Sixth Wave Transportation:
Phase Two: Transformation



Sixth Wave AI:
Phase One. Narrow.

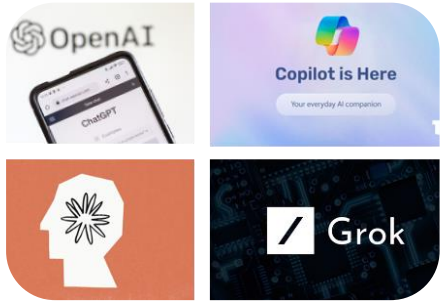


Sixth Wave AI:
Phase Two: Transformative.



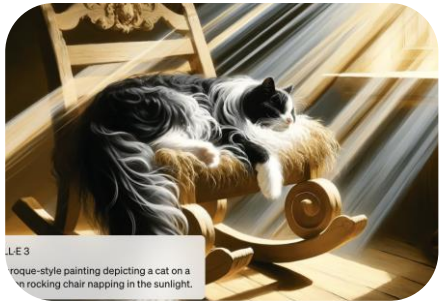
Sixth Wave Phase Two AI: Artificial General Intelligence

The creative industries are the first to fall…



Text-to-Text:

- Chat GPT, Claude3, Copilot, Grok

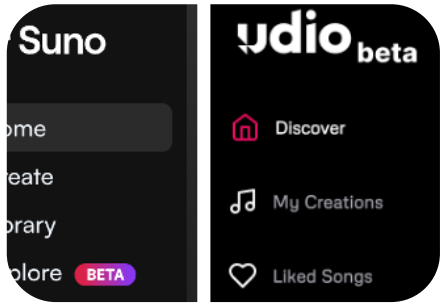


Text-to-Image:

- Dalle-3, Midjourney 5.1

Text-to-video:

- Sora, VEO



Text-to-Music:

Suno, Udio

The AI wars heat up with Claude 3, claimed to have "near-human" abilities

You can now use the DALL-E 3 AI image generator inside Bing Chat

Midjourney 5.1 Arrives – And It's Another Leap Forward For AI Art

Google Unveils Veo, a Text-to-Video Generator to Rival OpenAI's Sora

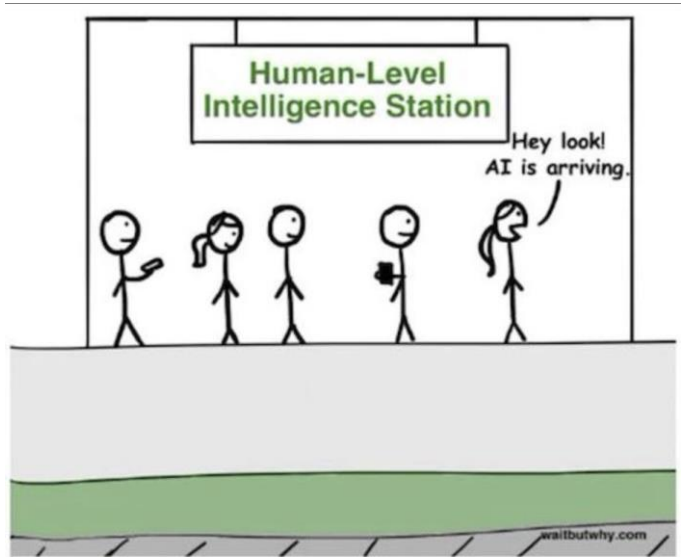
CHATGPT CAN WRITE MUSIC: IS AI THE LAST HOPE FOR SONGWRITERS?

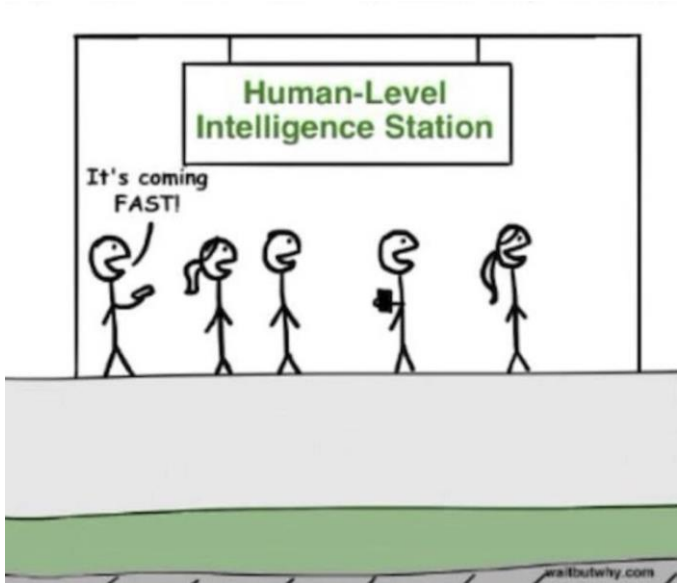
AI Can Now Generate Entire Songs on Demand. What Does This Mean for Music as We Know It?

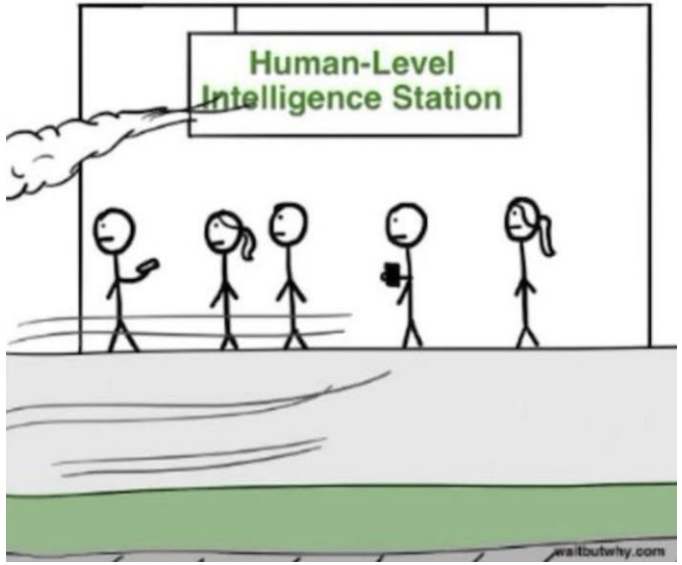
By **Oliver Bown** › May 7, 2024

AI-Music Arms Race: Meet Udio, the *Other* ChatGPT for Music

The Great AI Acceleration is well underway.
Next Stop AGI?







AGI is here. From ChatGPT, to multimodal Gen AI in 18 months.

GPT-4o is a stunning leap forward in AI

GPT-4o: OpenAI unveils new AI model with real-time speech and vision capabilities

The firm says it "accepts as input any combination of text, audio, and image and generates any combination of text, audio, and image outputs".

A.I.'s 'Her' Era Has Arrived

New chatbot technology can talk, laugh and sing like a human. What comes next is anyone's guess.

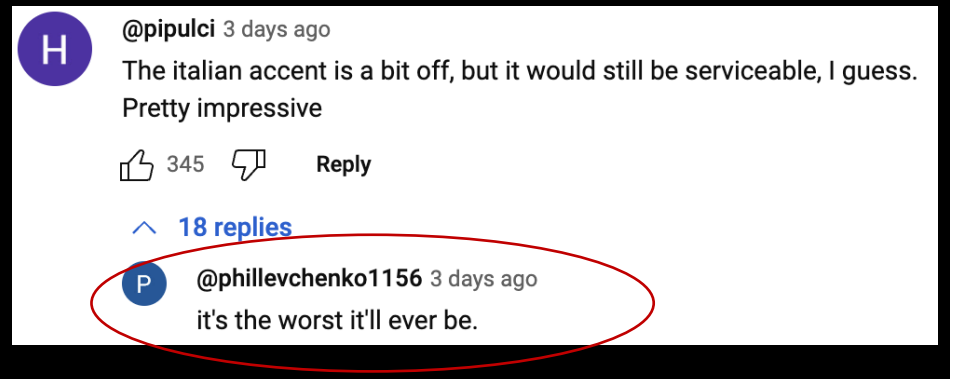
ARTIFICIAL EMOTIONAL INTELLIGENCE —

Major ChatGPT-4o update allows audio-video talks with an "emotional" AI chatbot

New GPT-4o model can sing a bedtime story, detect facial expressions, read emotions.

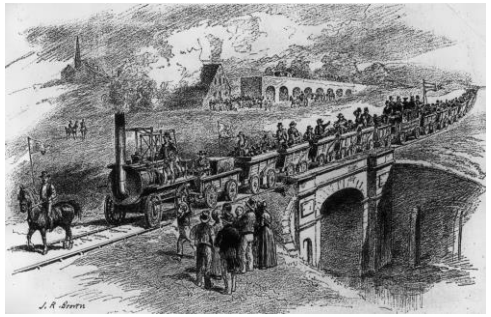
BENJ EDWARDS AND KYLE ORLAND - 5/13/2024, 6:58 PM

GPT4o example 1of x. The Babel Fish: real time language translation.



Creative Destruction Phase Two has always resulted in a **technological Golden Age**

Industrial Revolution - Golden Age of Canals and Industry (First Wave)



2nd Revolution - Golden Age of Rail & Steam (Second Wave)

Victorian Golden Age -'La Belle Epoque' (Third Wave)

Roaring Twenties & Golden Age of the Automobile (Fourth Wave)

Pax Americana & Golden Age of Telecom and Computing (Fifth Wave)

Digital Golden Age:
Age of AI, Robotics, & the Internet of Everything
(Sixth Wave)

AI is already creating unbelievable levels of wealth creation.

TECH

AI gave tech giants a $2.4 trillion boost to their market caps in 2023

Tech Titans up 36% in the past year, adding $2.4T of market cap - NVIDIA joins the $1T+ Club

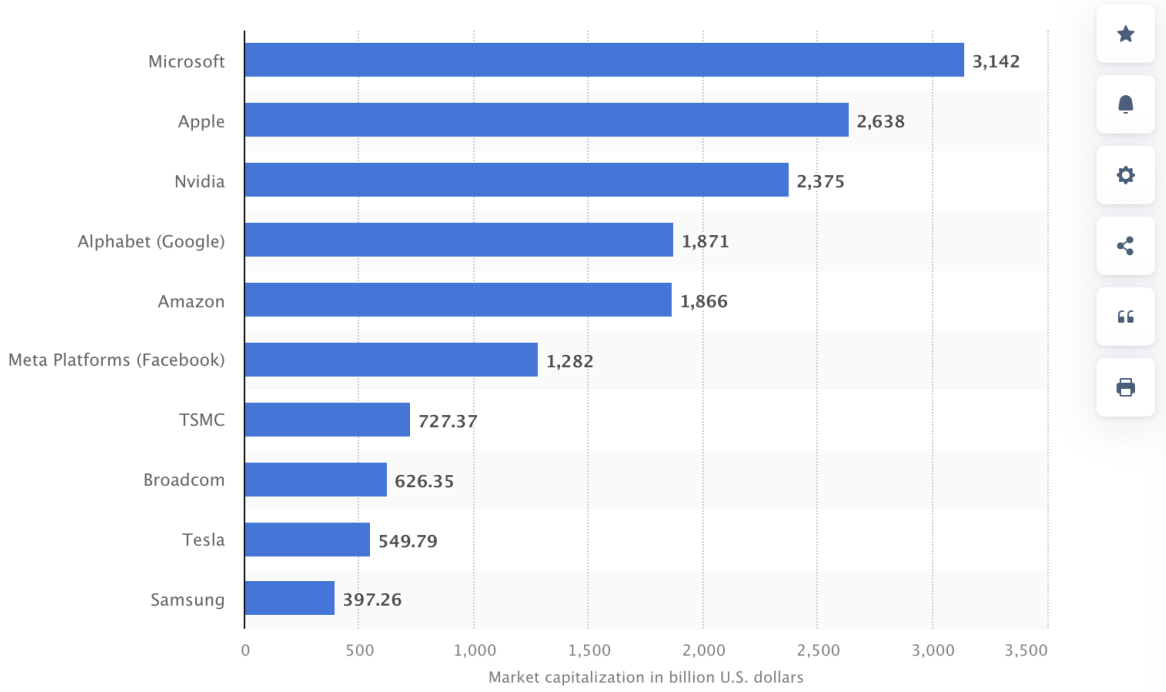
Accel Euroscape 2023

Note: Comparison between September 30, 2022 and September 30, 2023.
Source: CapIQ, Accel Analysis

5

Leading tech companies worldwide 2024, by market capitalization

(in billion U.S. dollars)



© Statista 2024

Robots are about to have their own ChatGPT moment.

Humanoid Robots + Gen AI = Exponential Growth

Humanoid robots include the following technologies:

- Speech recognition
- Language translation
- Vision and Image Recognition
- Haptic Capabilities
- Gen AI reasoning

Humanoid robot-maker Figure partners with OpenAI and gets backing from tech giants

Sanctuary AI Announces Microsoft Collaboration to Accelerate AI Development for General Purpose Robots

May 01, 2024 | Press Release

SANCTUARY AI | Microsoft

- Robots aren't programmed anymore - they are learning systems.
- They increasingly understand physics and the physical world.
- Soon AI systems will soon be designing other AI systems, and these AI systems will be placed inside machines.

Sixth Wave Phase Two:

Get Ready for humanoid robotic labour as a service…

Tesla unveils humanoid robot that can pick up an egg without breaking it

Machine dubbed Optimus 'Gen 2' boasts improved balance and hand movements

Matthew Field
13 December 2023 • 10:02am

The race to build AI-powered humanoids is heating up

Figure 01 is a bipedal, AI-powered humanoid. And it wants to work in a warehouse.

Sanctuary AI unveils a humanoid robot called Phoenix that's ready to offer its 'labor-as-a-service'

Apptronik Introduces Apollo Humanoid Robot ›

Apollo's custom actuators will keep the cost low

BY EVAN ACKERMAN | 23 AUG 2023 | 6 MIN READ

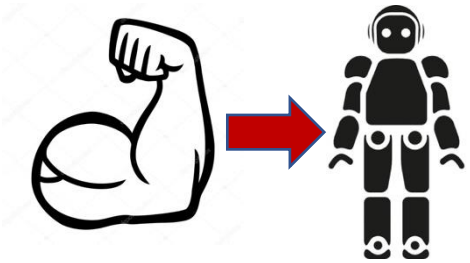
The global Humanoid Robot Market size is expected to reach $39.6b by 2030, growing at a CAGR of 52.8%

Toto, I've
got a feeling
we're not in
Kansas
anymore.

Phase Two: A new Industrial Revolution:
The Automation Triple Whammy…

Whammy 1:
Horizonal Convergence

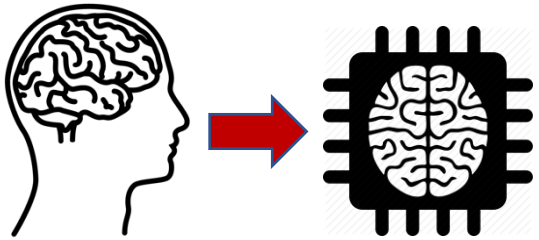
Muscle to Machine



The Automation of Physical Tasks

Whammy 2:
Vertical Convergence

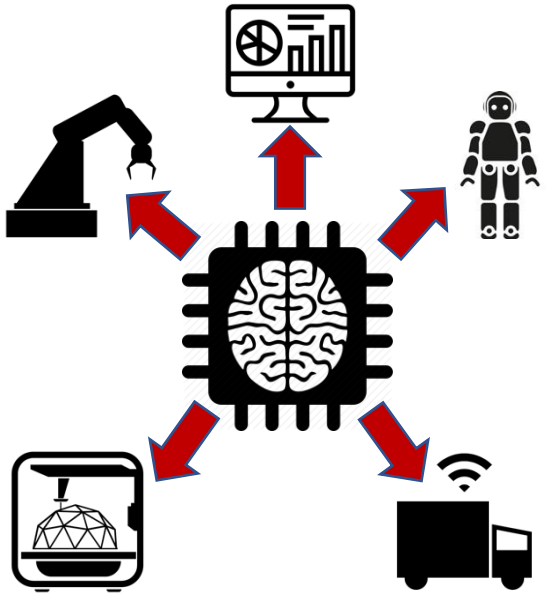
Mind to Machine



The Automation of Knowledge Based Tasks

Whammy 3:
Technological Convergence

Machine to Machine



The Automation of the End-to-End Supply Chain

Phase Two Supply Chain innovations are going to be transformative
– but only for those for those able to create value from them.

The Future: a PAL Supply Chain

Personalised

products, services & experiences

IoT & AI create a world of personal preferences and pricing
Mass production replaced by customization and configuration - batch size of 1

Automated

manufacturing, delivery & planning

AI machine learning & cognitive computing
3D printing to products on demand
Robotic production to autonomous delivery
Transactions processed by the blockchain, RPA & chatbots

Local

production, logistics and retail

Production reshored near the consumer
Development oi autonomous, micro logistics network to support 1-hour delivery – urban logistics repurposing car parks etc.

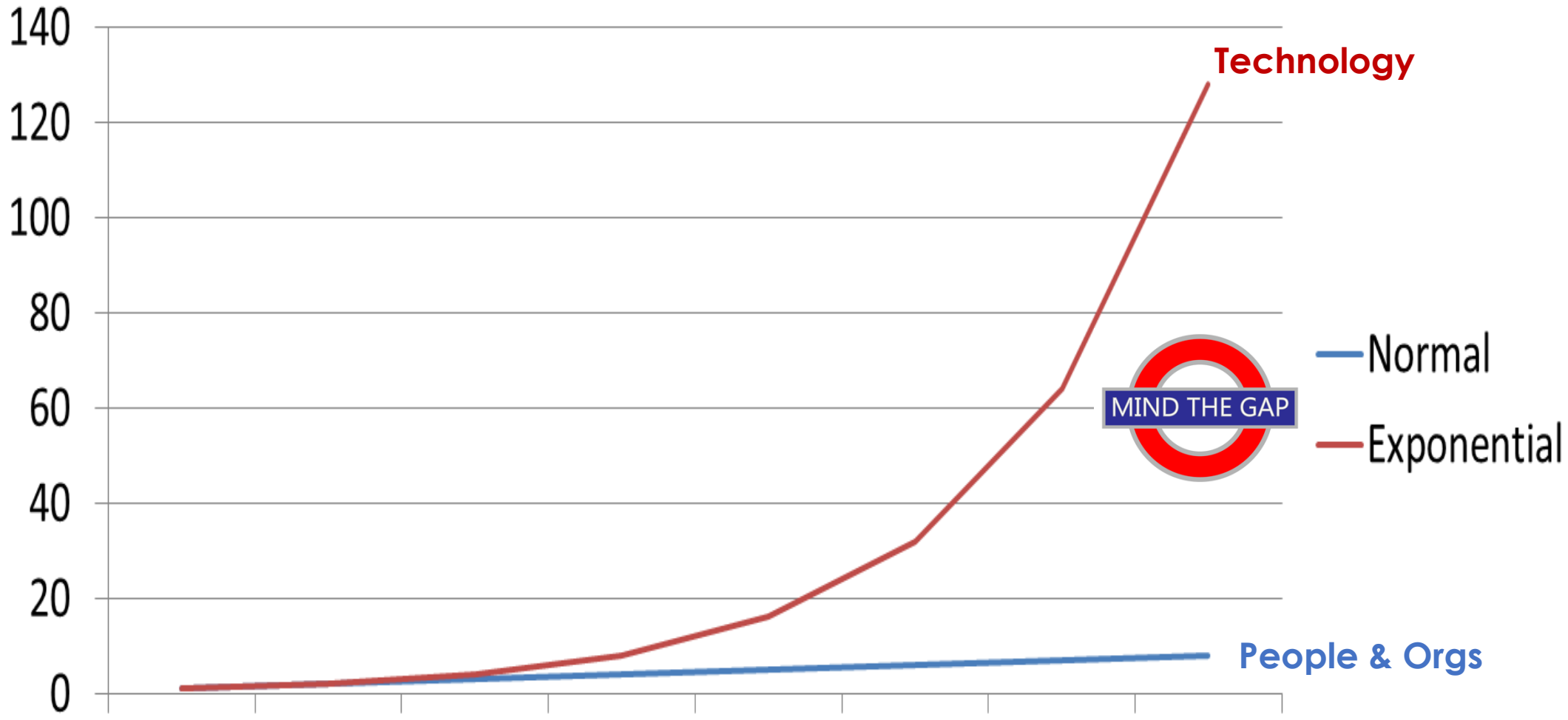
=

Shorter, stronger, more agile and more sustainable supply chain.

Things will never again be as slow as they are right now…

Beware the Cultural Lag!

Technology changes at an EXPONENTIAL rate, but people & organisations change LINEARLY



Most organisations are fragile:

Functional and industrial age mindsets, methods and management styles leave businesses exposed in the face of this oncoming wave of disruptive change.

The Reality for Most Organisations…
Analog Mindsets in a Digital World

"Right now, your company has
21st-century Internet-enabled business processes,
mid-20th-century management processes,
all built atop 19th-century management principles."

- Gary Hamel 'What Matters Now'

Sixth Wave supply chain management = 4D chess.

Have to make 1000s of daily decisions on multiple variables:

- Vertical (strategy to execution)
- Horizontal (e2e supply chain)

Need to understand the supply chain's strategy, performance metrics, network, processes, systems and resources.

Codify the strategic trade-offs of decisions across the end-to-end supply chain:

- Low carbon vs low cost?
- Sustainability vs speed?
- Agility vs Lean

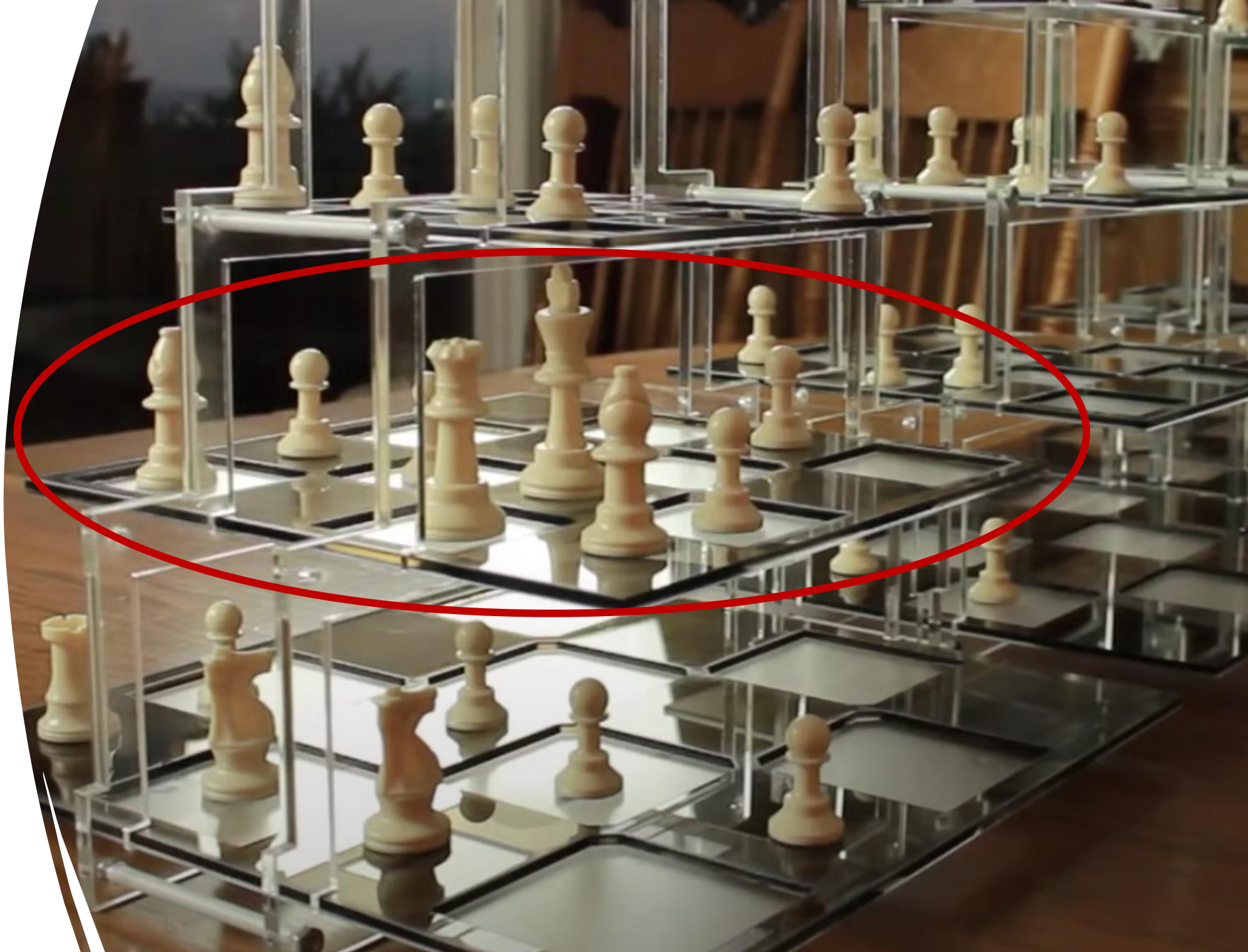
Develop a strategic playbook that includes mitigation tactics and contingency plans in the event of a major disruption or risk.

Unfortunately, most companies are still operating in process silos, only seeing the adjacent moves, and **not the rest of the game**.

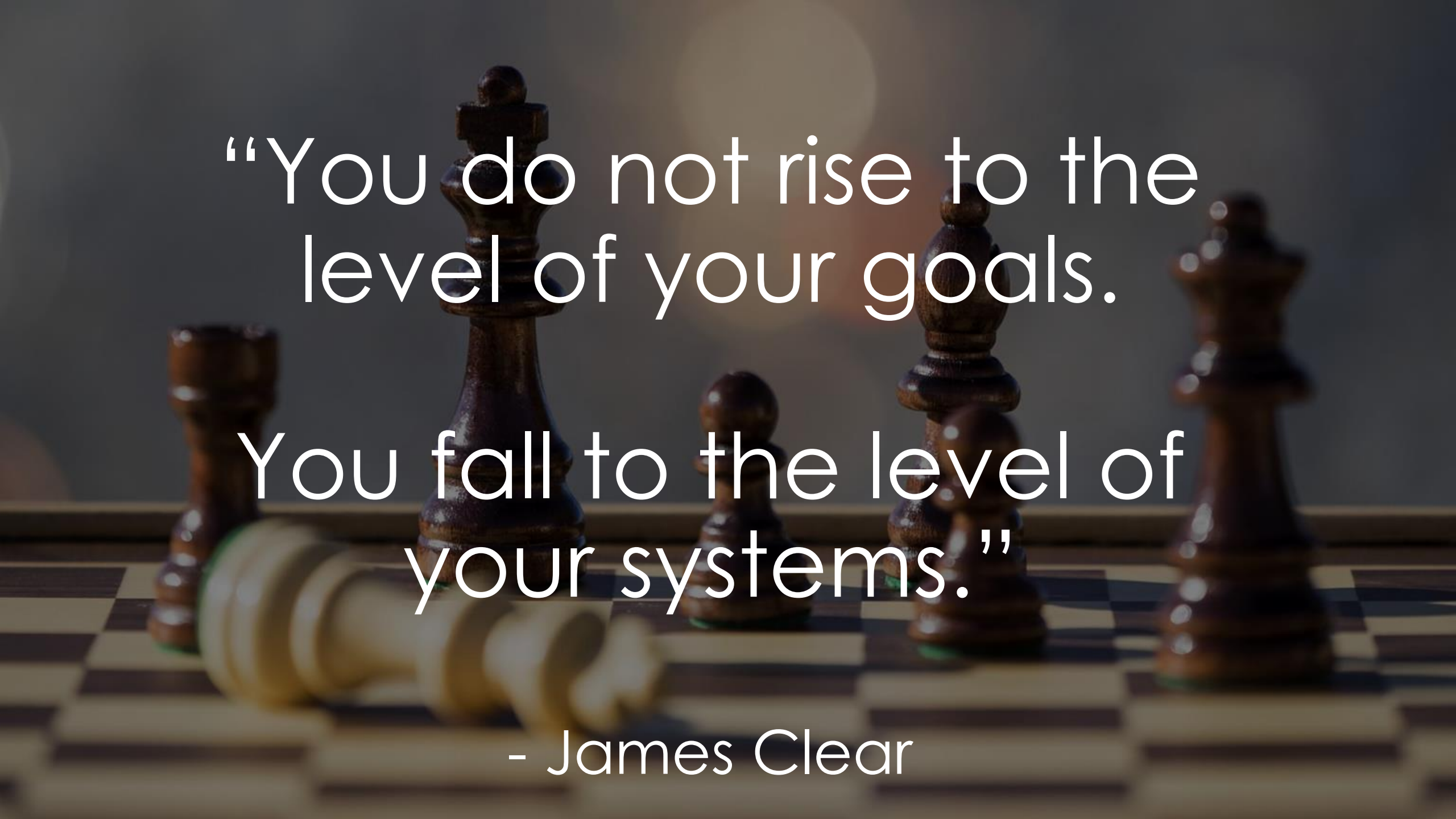
Moves are functional & operational, **not strategic & end-to-end.**

Only ever thinking **one move ahead,** simply reacting to events.

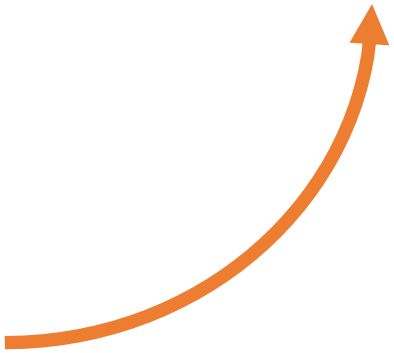
Trade-offs and the wider implications of decisions are **not well understood.**



Why is this still the case?


"You do not rise to the level of your goals.
You fall to the level of your systems."
- James Clear

These systems are led by people trained to handle change in the downswing, not the upswing. To control, not disrupt.



Downswing.
Rate of change is linear

Environment is controlled & stable

This affected the culture they developed, the things that were measured, and the skills and behaviours that were valued.

A world of certainty, with focus on accuracy and having the answers

Upswing.
Rate of change is exponential

Environment is chaotic & ever-changing

The measures, skills and culture all need to change to adapt to this new environment.
Leaders are struggling to control their business in a world that **no long aligns to what they were taught.**

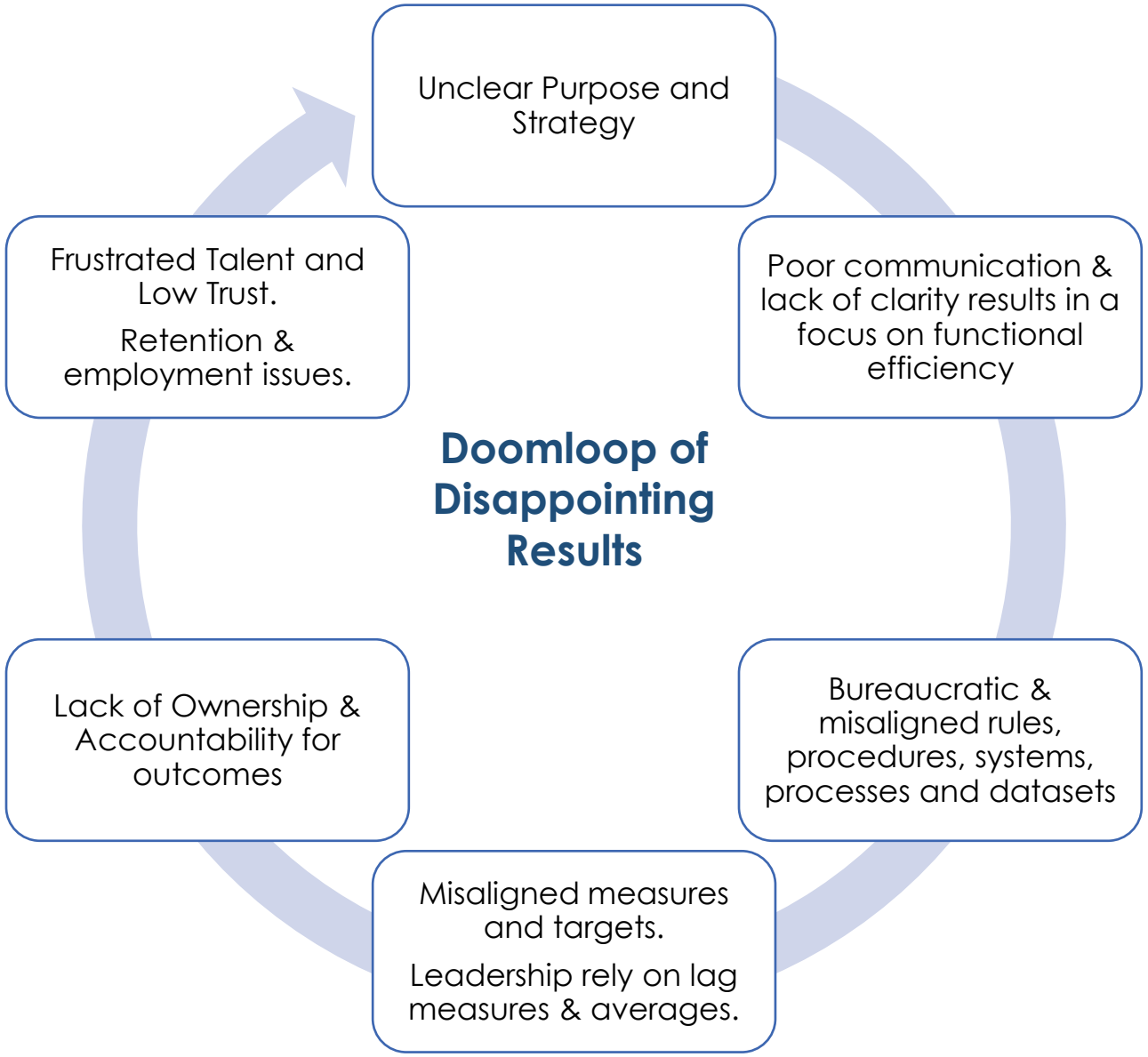
A world of uncertainty, with a need for agility and ability to ask the right questions

Fifth wave mindsets, operating models and methods still dominate…

The vast majority of companies still:

- Operate with a short-term, cost-focused mindset
- Have an inherent fear of taking risks
- Are driven by quarterly analyst expectations, not long-term value
- Seek immediate ROI from investment & innovation opportunities
- Do not strategically design the flows through supply chain from the customer back
- Do not consider the form and function of inventory, only the quantity and value.
- Focus on efficiency of activities rather than effectiveness of outcomes
- Operate in functional silos with:
    - Disparate systems that don't talk to each other
    - Agendas that are counter-productive
    - Metrics that don't align.
- **Play not to lose, rather than playing to win.**

Fragile organisations are frustrating places to work…



What is visible and reported on:

What we don't see:
Huge amounts of wasted effort and money:

Transactions are recorded and reported, but the issues are never captured, decisions documented, or lessons learnt.

The company develops **no memory** of the issues, their root causes and actions taken.

While individual experience may increase, the organisation's **collective intelligence** does not.

The company is also constantly at risk of knowledge leakage.

The reality for people trying to manage this supply chain complexity…

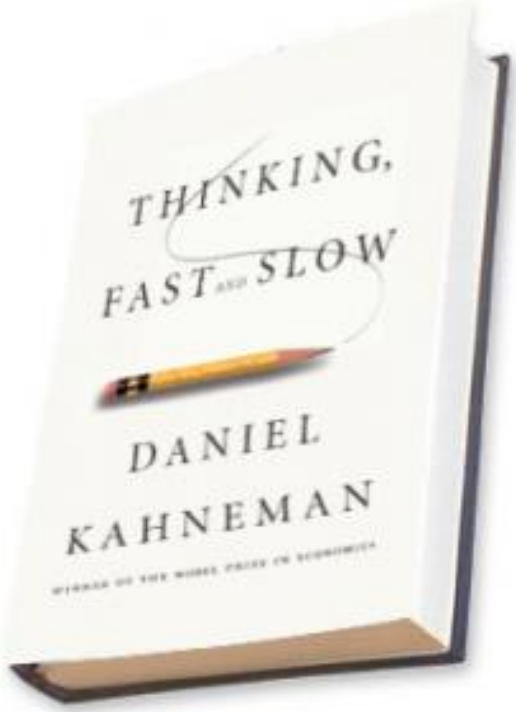
	Urgent	Not Urgent
Important	**Q1 - Fire Fighting** ***(Necessity)*** Crisis issues or immediate demands Problem / solution Demands from superiors Pressing Issues / overdue work Deadline Driven projects Urgent meetings **61%**	**Q2 - Fire Prevention** ***(Planning & Preparation)*** New Opportunities Planning & Preparation Systems and Process Development Relationship Building Personal Development / wellbeing **10%**
Not Important	**Q3 - False Alarms** *(Deception)* Ad-hoc Interruptions Other people's emergencies / issues Filling out update reports Pressing matters to others Reading e-mails / Attending non-urgent 'update' meetings **28%**	**Q4- Fire Escape** *(Waste)* Trivia / Gossip / Social chatting Internet surfing, irrelevant reading Embellishment / overproduction Time wasters / wasting Non-value adding 'Escape' activities **1%**

**Adapted from Stephen R. Covey's 'The 7 Habits of Highly Effective People'*

Unfortunately, human decision making at speed is all System 1…

System 1

- Fast, automatic, and agile.
- Consequences often not well thought through
- Rely on biases and past experience
- Often imperfect and lead to unintended consequences elsewhere in the supply chain.



System 2

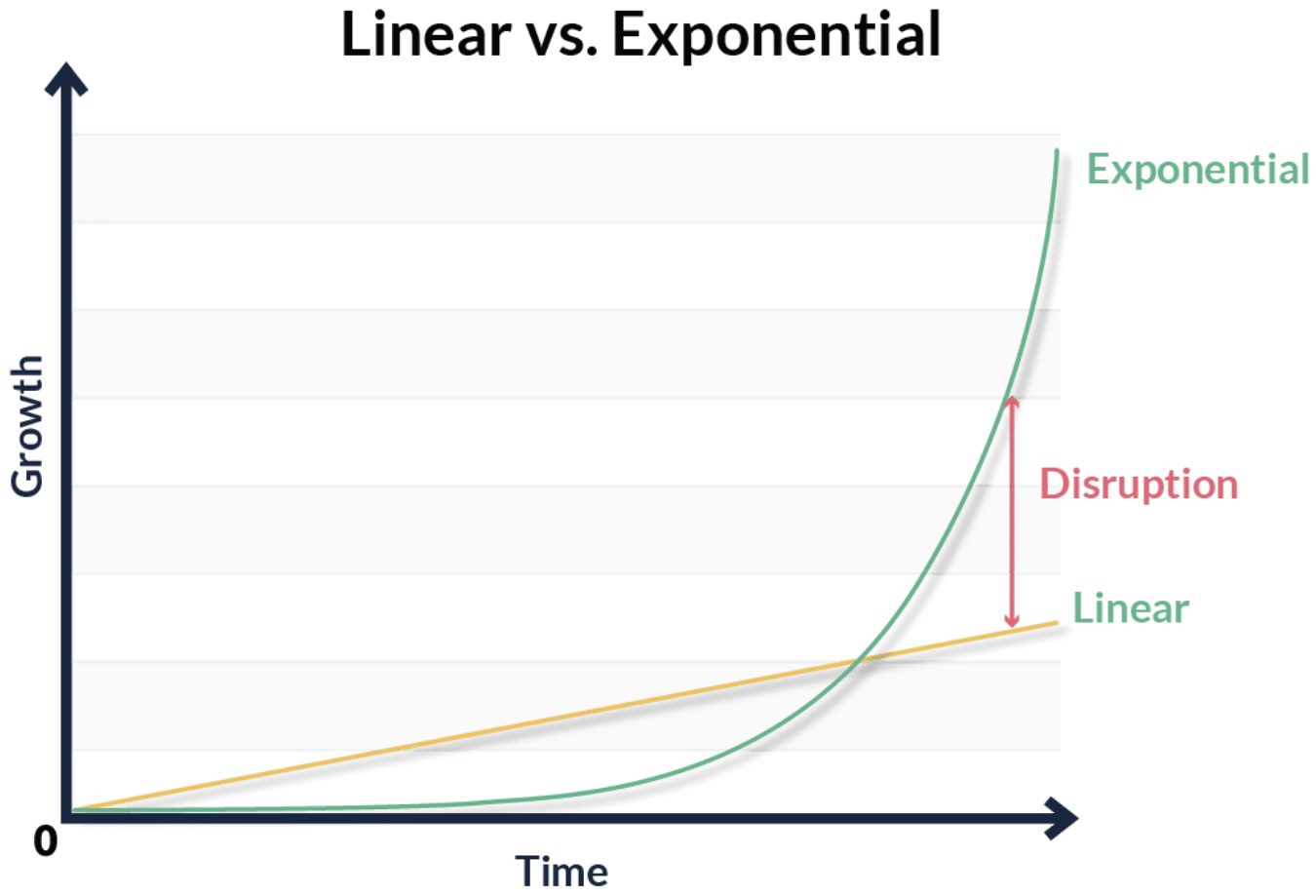
- Slow, methodical, logical, well-thought out.
- Acting with a sense of purpose and conscious design.
- Rely on data and facts
- Consider trade-offs, impact and unintended consequences of the decision.

Greater uncertainty and volatility = greater firefighting.

Increased firefighting = **more** System 1 thinking and **less** System 2.

The demand for instant, high-quality decisions outstrips its supply.

The clock speed of decision-making has increased exponentially



Level of decision making that is required…

The reality for nearly every business is that the future will be spent in this zone…

Level of decision making that humans are capable of…

All of these phase one technology investments must be making things easier?

Not really: it's a world of digital disappointment: Some digitization, but little transformation.

Digital Transformation Projects Have an 84% Chance of Failure; Are You Ready to Failure or Succeed?

9 out of 10 digital transformation projects will fail

Why do 87% of data science projects never make it into production?

Why So Many High-Profile Digital Transformations Fail

Digital transformation churn: Why the digital transformation fail rate is so high

Why Innovation Labs Fail

60+% of companies surveyed have plans to invest in Intelligent Automation.
However, an equal 60+% say they are not organisationally prepared for its adoption.
- *Dwight Klappich, Gartner*

The two most common approaches to digital transformation…

"I want you to find a bold and innovative way to do everything exactly the same way it's been done for 25 years."

Replicate

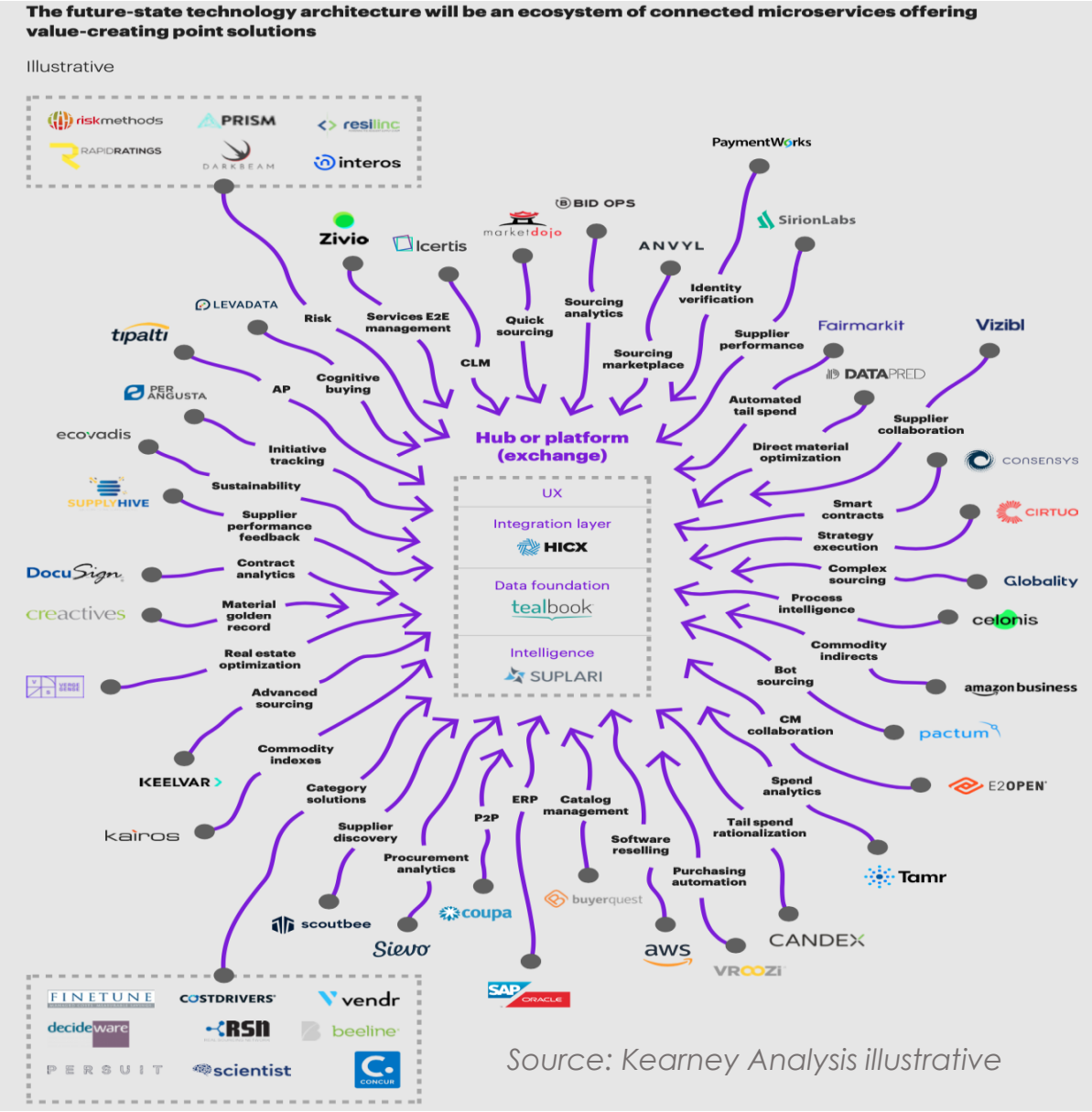
(Digitise existing processes and ways of working)

"We need to innovate! Buck the status quo! Blaze a new trail! Here's how everyone else is doing it…"

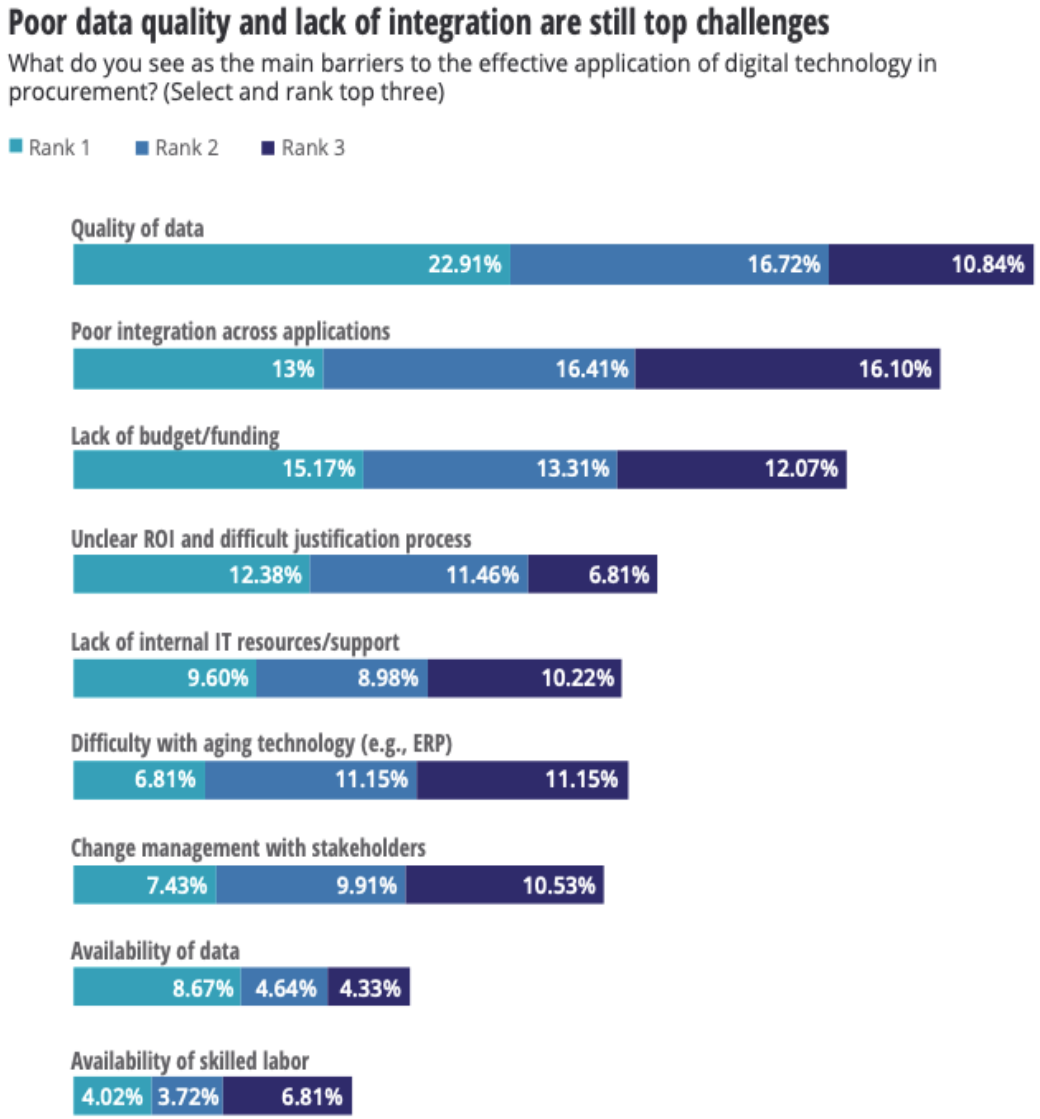
Imitate

(Wait to see what others do/buy and copy it)

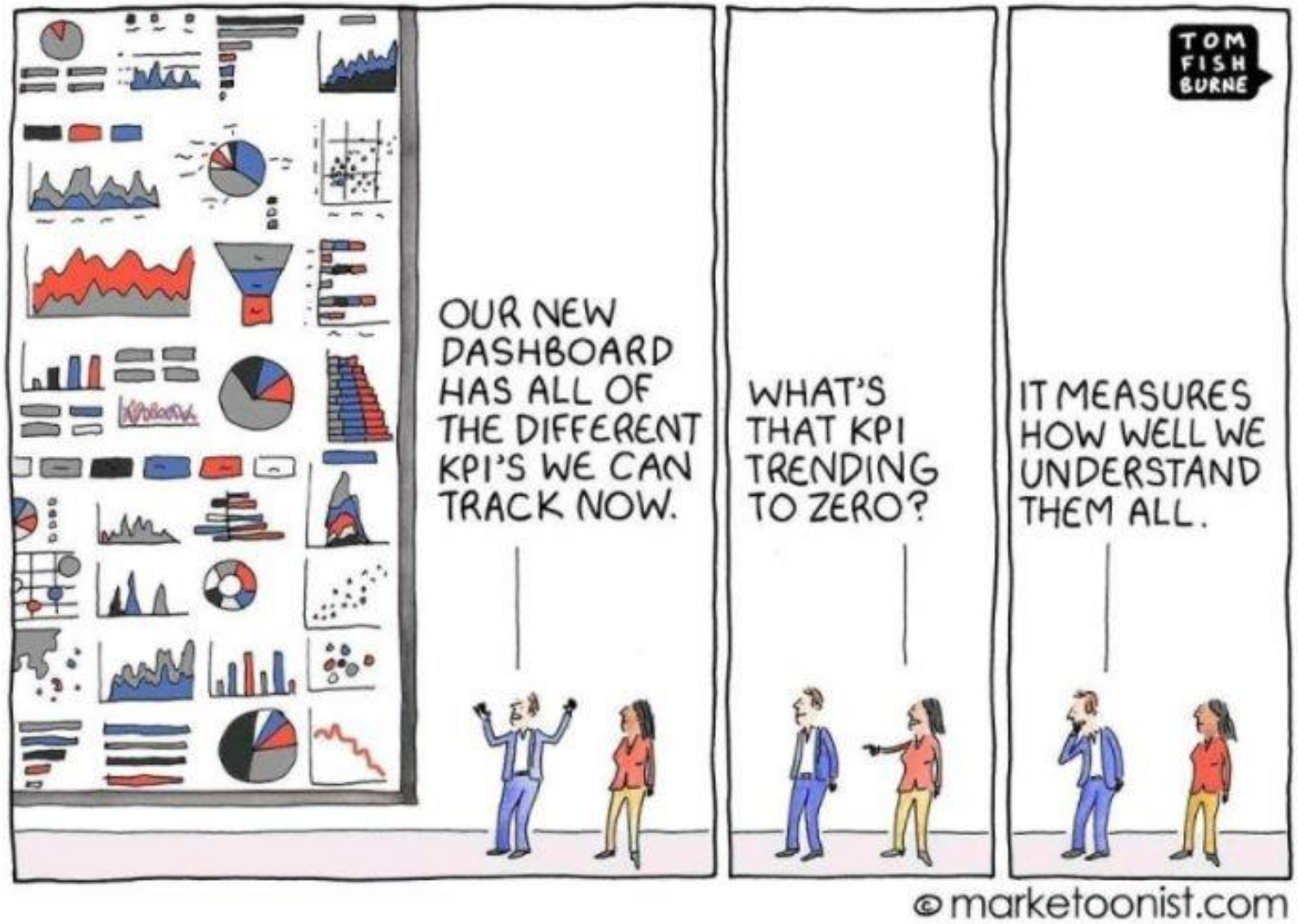
Current solutions are making things more complex, not less…



Source: Kearney Analysis illustrative



Source: Deloitte Global CPO Survey, 2021.



Most investment in ML and analytics ends up simply making **problems look pretty**.

…the value is hidden in the volume, and the result is confusion **not action**.

More visibility leads to more alerts…

…creating more pressure for already overloaded employees.

Without a clear focus on how it can deliver value to the customer, digital technology…

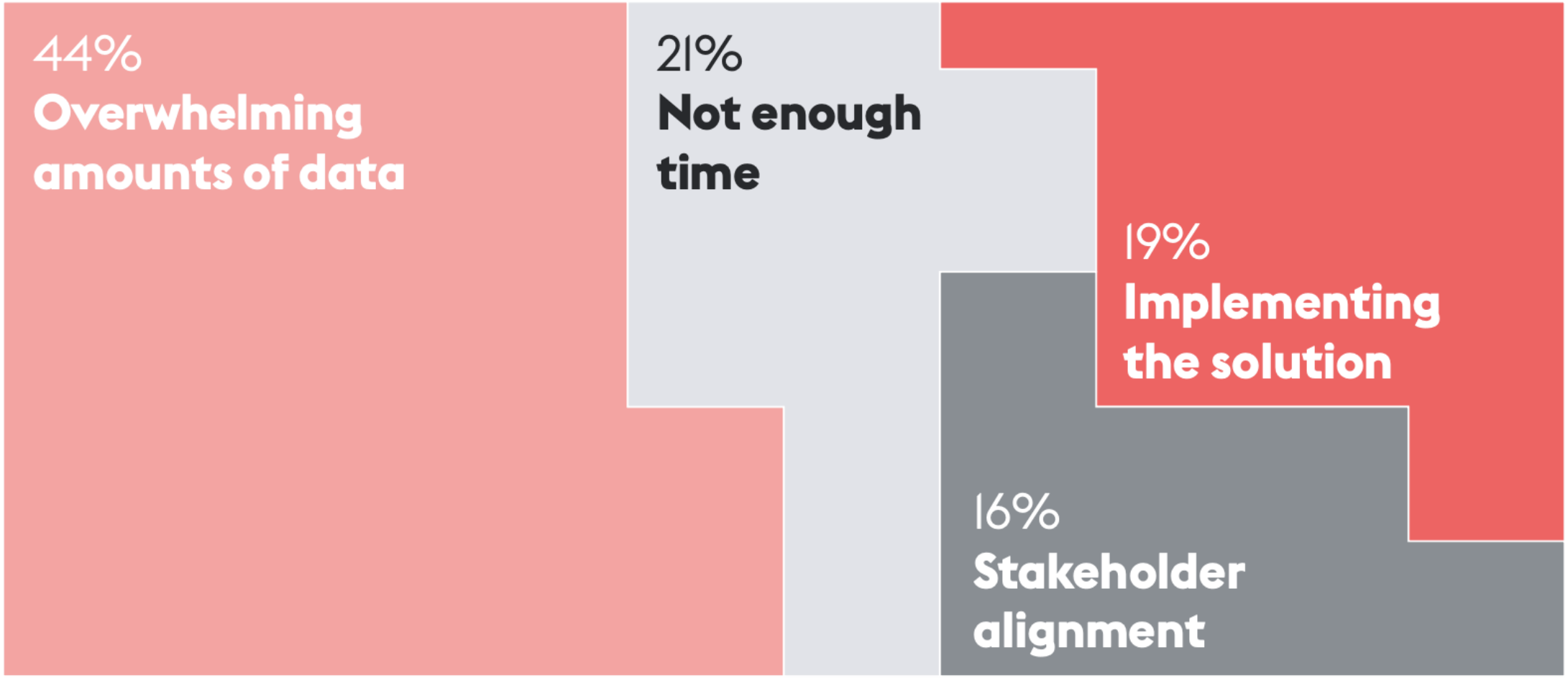
Sounds like this…

Actually requires this…

Ends up like This.

Surely all this new data we've captured is helping?

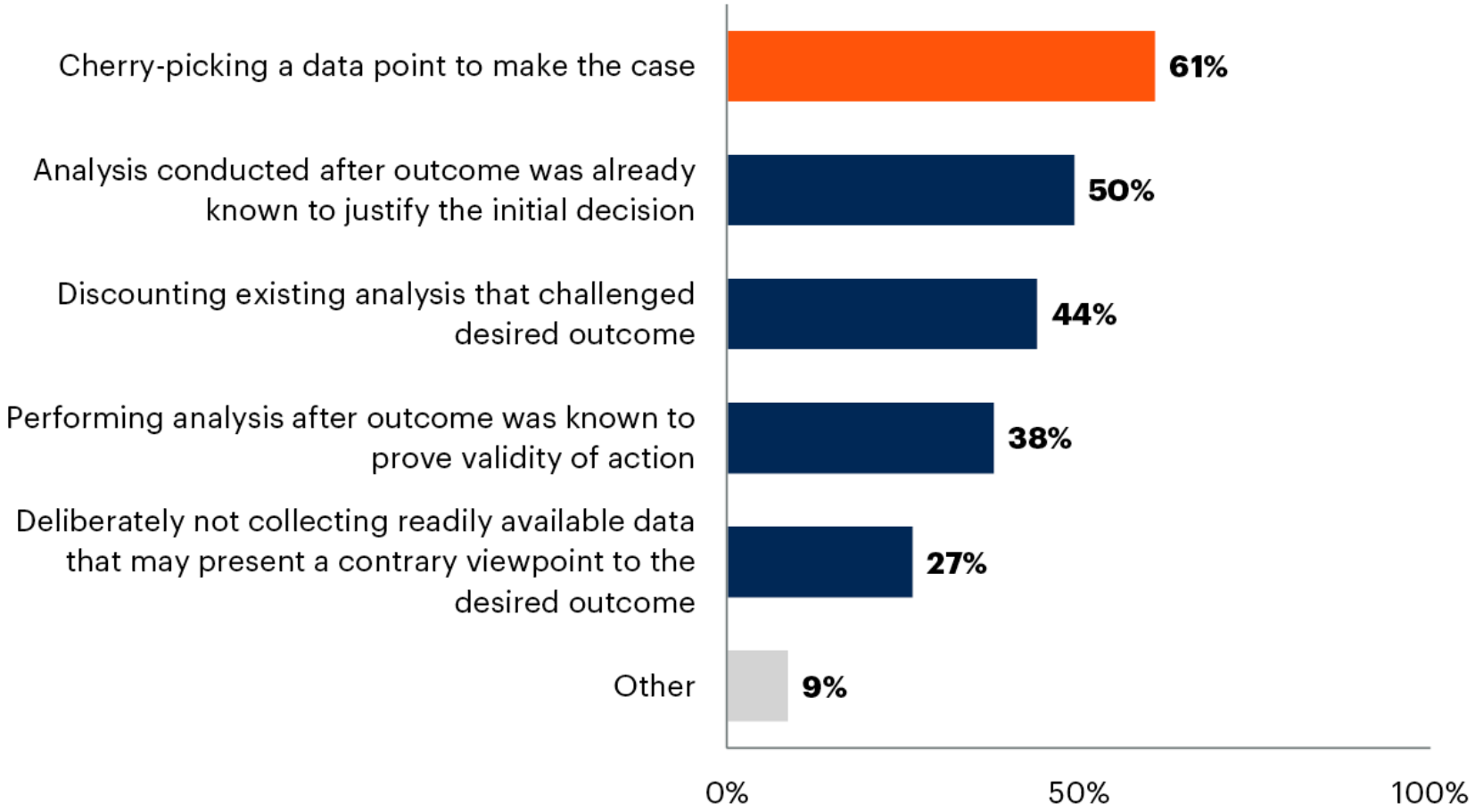
The volume of data is making decision-making more difficult, not less.



Source: Signal – '*The-state-of-decision-making-report-2021*'.
Survey of 1,000 C-suite leaders from organizations of over 500 employees

80% of leaders feel they have too much data to consider when making decisions.

And when we do use data, its used in the same way a drunk uses a lamppost - for support, not illumination…



n = 113 (All respondents; excluding 'Not sure')

Q: Which of the following, if any, do you believe occur at your organization?

Source: Gartner 2021 Reengineering the Decision Survey

- *"Two-thirds say decision making is only somewhat or rarely data-driven."*
- *"58% of companies base 50% of their decisions on gut feel."*
- *"53% cherry-pick a certain data point to help them make the case."*

Many companies are data rich but insights poor.

Hard to swallow pills

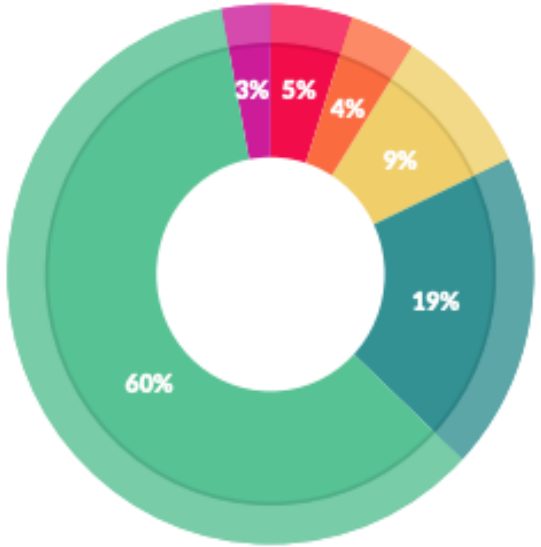
Their data lake vision has turned into a data swamp reality.

BUILDING A DATALAKE WONT SOLVE YOUR BAD DATA PROBLEMS
54
543
imgflip.com

Data Scientists spend their lives trying to clean the swamp …

How a Data Scientist Spends Their Day

Here's where the popular view of data scientists diverges pretty significantly from reality. Generally, we think of data scientists building algorithms, exploring data, and doing predictive analysis. That's actually not what they spend most of their time doing, however.



What data scientists spend the most time doing

- *Building training sets: 3%*
- *Cleaning and organizing data: 60%*
- *Collecting data sets; 19%*
- *Mining data for patterns: 9%*
- *Refining algorithms: 4%*
- *Other: 5%*

79% of Data Science effort is spent collecting, organizing, and cleaning data

The New York Times

For Big-Data Scientists, 'Janitor Work' Is Key Hurdle to Insights

Forbes

Cleaning Big Data: Most Time-Consuming, Least Enjoyable Data Science Task, Survey Says

Here's why so many data scientists are leaving their jobs

Frustrations of the data scientist!

Why Data Scientists Are Increasingly Quitting Their Jobs: Lack of Skills or Different Expectations?

Why So Many Data Scientists Quit Good Jobs at Great Companies

A look at why the 'sexiest job of the 21st century' has lost its appeal

The Problem:

Most companies are still operating with an analog mindset in this digital age.

They are focusing on digitising existing processes and ways of working, rather than actually transforming the way the business operates.

To maximise the potential of all this new wave hardware and software, **new wave thoughtware** is required.

Are you digitally transforming your business?

Or just digitizing the old one?

What got us here won't get us there…
We need to go beyond trying to be resilient.

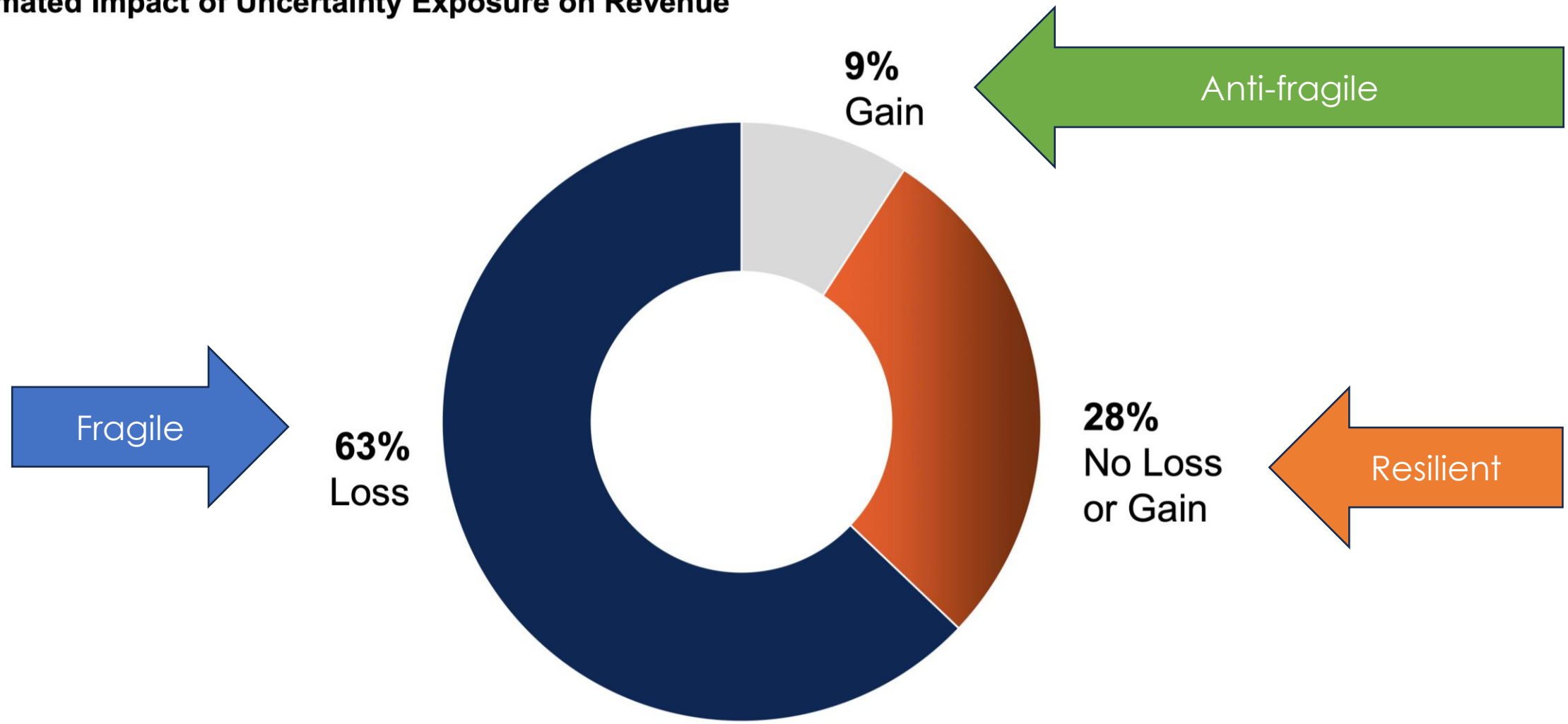
Resilience is the ability to withstand shocks and to return to the previous state relatively undamaged…

…but a return to a previous state is insufficient during exponential change.

When the future doesn't look like the past,
you need to evolve and adapt to a new reality,
rather than return to one that no longer exists.

Uncertainty: Kryptonite for most companies, a problem for many, but gold dust to a chosen few…

Estimated Impact of Uncertainty Exposure on Revenue



Source: 2023 Gartner Antifragile Supply Chain Management Survey

Go Beyond Resilience: Become Anti-Fragile

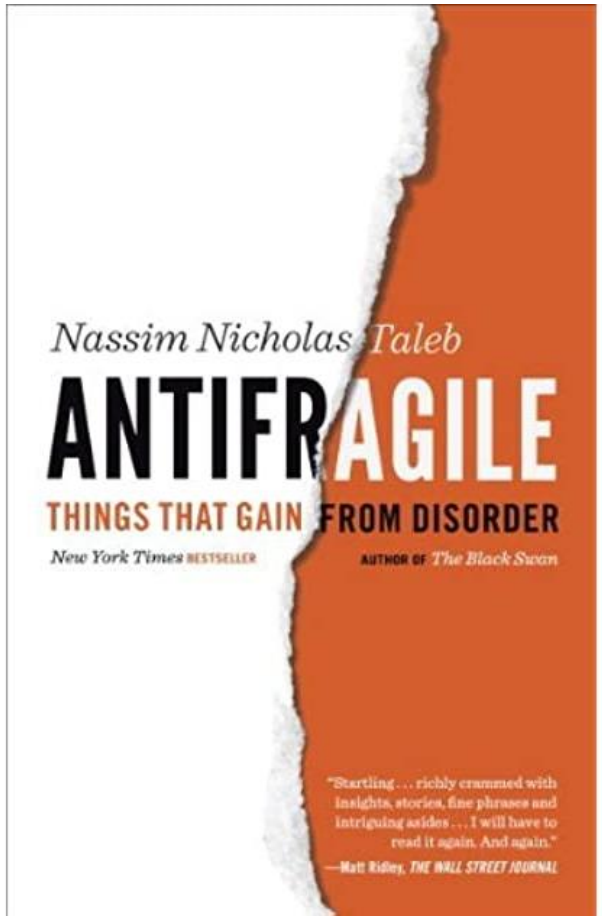
"Some things benefit from shocks; they thrive and grow when exposed to volatility, randomness, disorder, and stressors and love adventure, risk, and uncertainty.

Yet, in spite of the ubiquity of the phenomenon, there is no word for the exact opposite of fragile.

Let us call it ***antifragile****.*

Antifragility *is beyond resilience or robustness.*

The resilient resists shocks and stays the same; ***the antifragile gets better"***



From Fragile to Anti-Fragile

Every organisation is perfectly designed to get the result it gets…

Fragile

'I' shaped people in **'I'** shaped *functions*

Primary Focus:
Increasing operational efficiency

Hates uncertainty:
Causes disruption and Post-Traumatic Stress

Struggle

Resilient

'T' shaped people in **'T'** shaped supply chain *teams*

Primary focus:

Maximising effectiveness & flow across the chain

Manages uncertainty:
Creates an effective response

Survive

Anti-Fragile

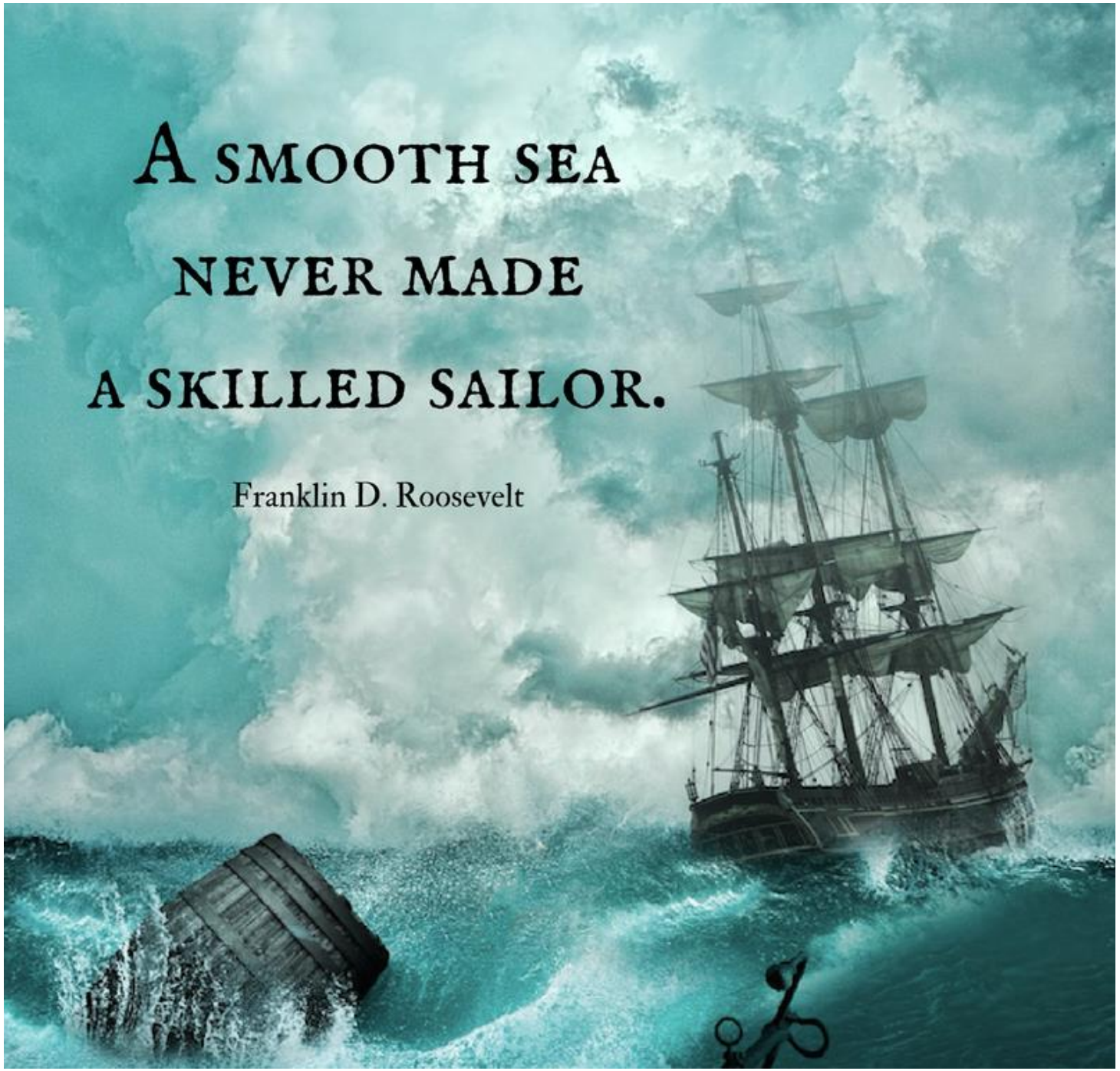
'X' Shaped people in **'X'** shaped value *networks*

Primary focus:

Creating more value for customers & stakeholders

Loves uncertainty:
Results in learning and Post-Traumatic Growth

Thrive



Is the rate of change going to slow down?
No.

Are things going to get easier?
No.

Are industrial-age company's going to make it?
Probably not.

Is there any way we can learn to not just survive, but thrive?
Yes.
Become Antifragile.

Beyond Resilience:
Change your mindset, change your future.

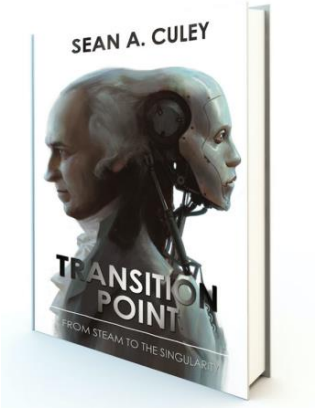
Webinar 3:
Becoming Anti-Fragile:
Learning to thrive in Disruptive Times

Thursday 27th June: 11:00 – 11:45am

What can companies do to not just survive, but thrive?

delaware

Thank you!
sean@seanculey.com



Questions

we commit. we deliver.