

BerkeleyHaas

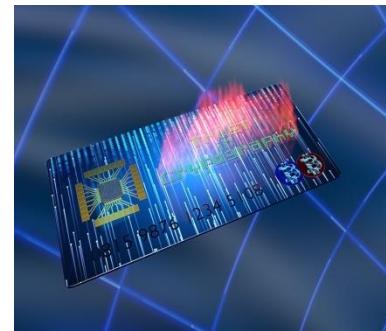
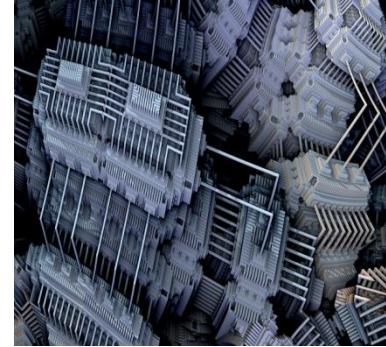
Future of Technology: Trends, Strategies, and Innovation Opportunities

Module 1: Introduction to Tech Futures

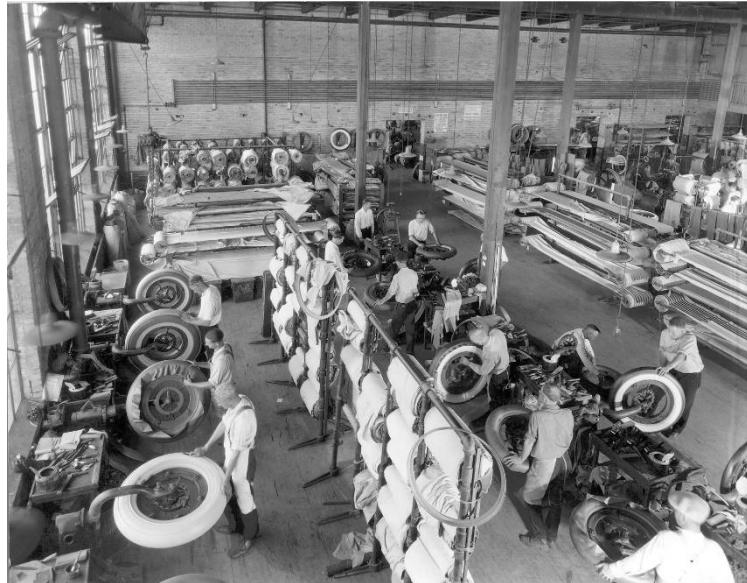
Summary

Video 1:The Fourth Industrial Revolution

The Fourth Industrial Revolution



Former Industrial Revolutions



The Fourth Industrial Revolutions



AI will contribute
14.5% of GDP growth



AI will contribute
26% of GDP growth



AI will contribute
9.9%-11.5% of GDP
growth

Former Industrial Revolutions



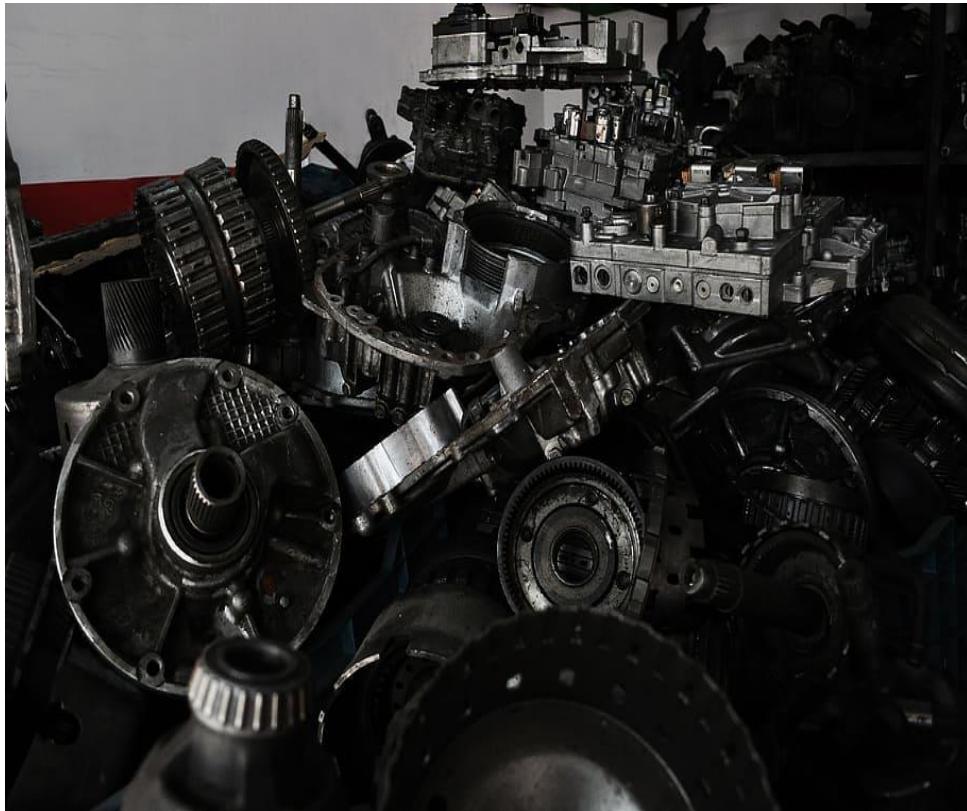
Physical & Hardware

The Fourth Industrial Revolution



Cognitive & Software

Automobile Industry



Profit share will be cut to
41% by 2030

Video 2: Introduction

Learning Objectives

- ◆ Explore trends, insights and implications of key disruptive technologies.
- ◆ Apply foresight tools and frameworks to evaluate opportunities in tech-driven futures.
- ◆ Leverage disruptive tech insights to drive innovation strategy.
- ◆ Create a technology portfolio to gain competitive advantages in your industry.
- ◆ Build resilience in your organization amidst technology disruption.



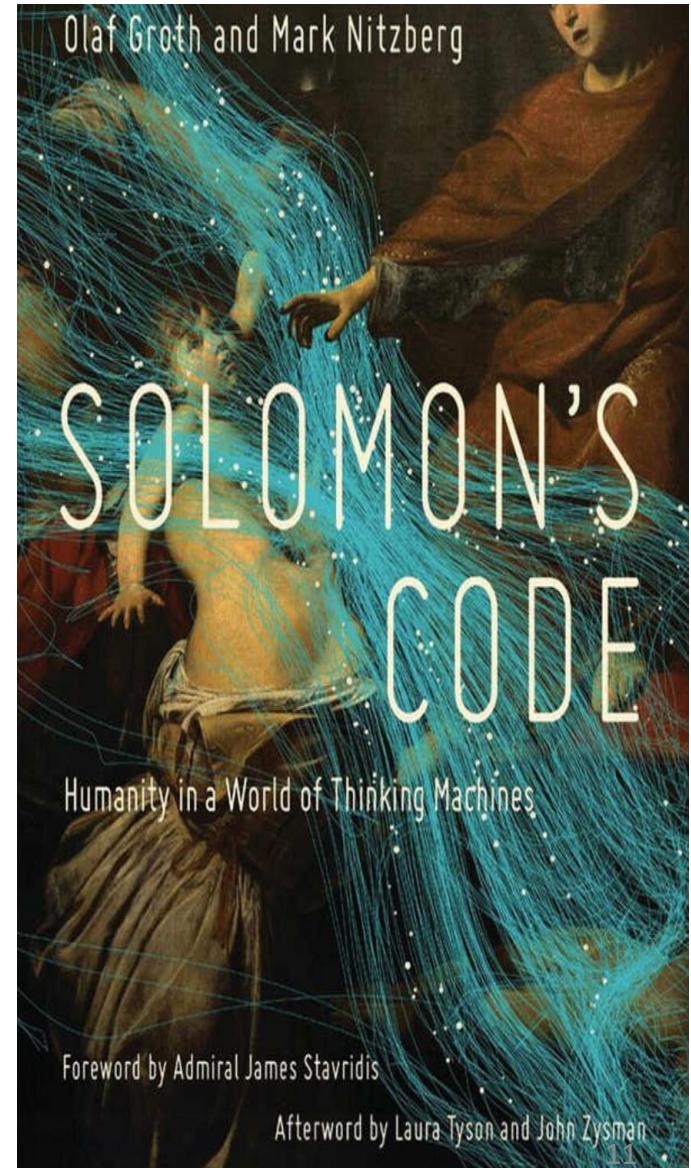
Berkeley
Haas



CAMBRIAN
FUTURES



WORLD
ECONOMIC
FORUM





Foundations in

- ◆ Germany
- ◆ USA
- ◆ Kenya

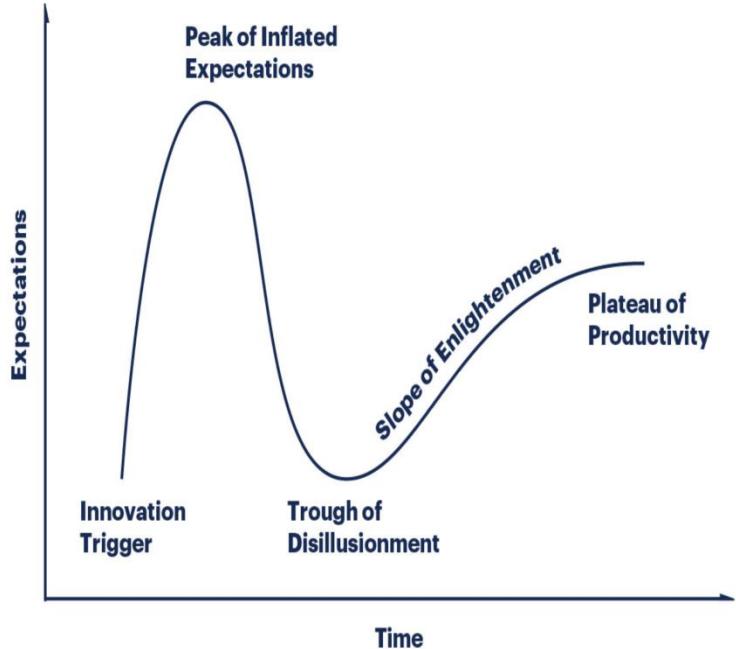
Governments of

- ◆ USA
- ◆ UAE
- ◆ Caribbean

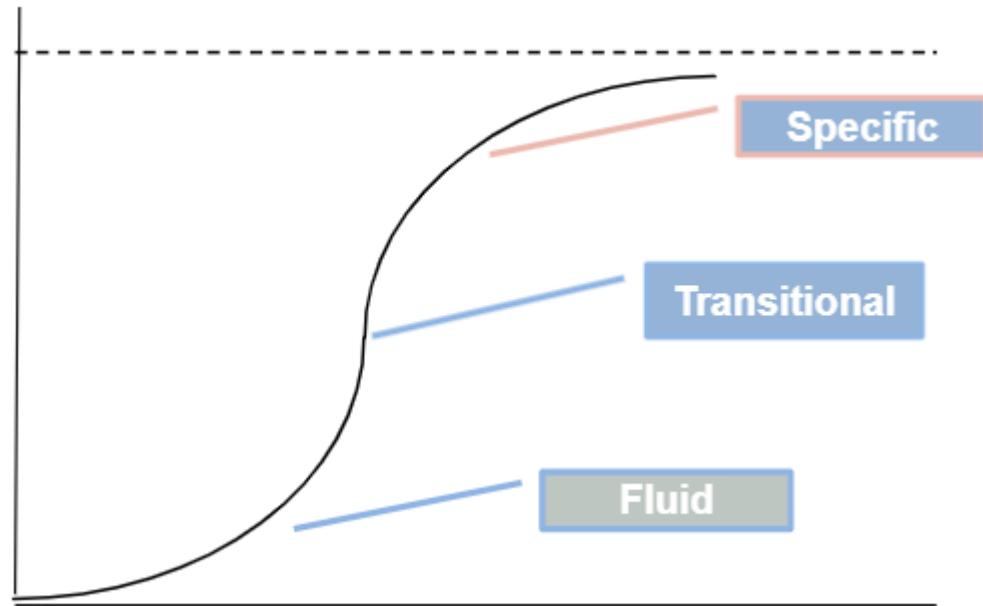


Video 3: Course Overview

Module 1: Introduction to Tech Futures

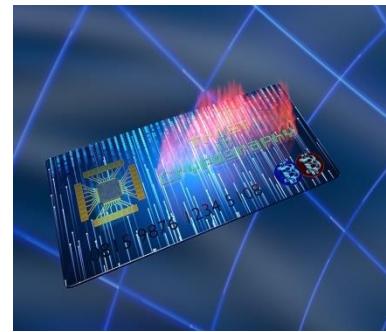
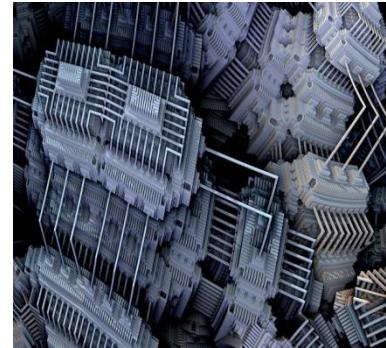


Gartner's Hype Cycle



S-Curve

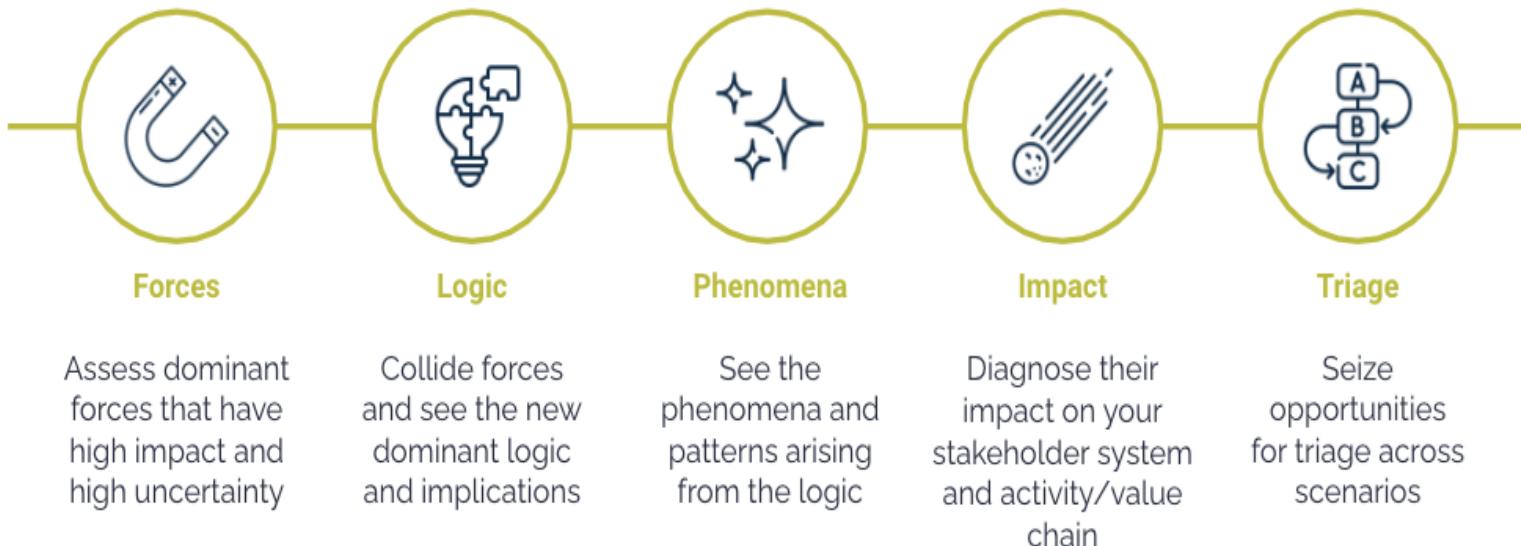
Module 1: Introduction to Tech Futures



Module 1: Introduction to Tech Futures

FLP IT Model

Five steps to resilience



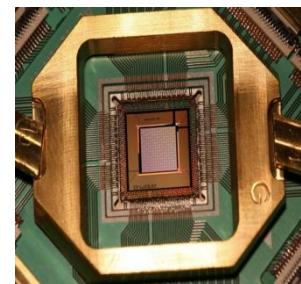
Course Overview

- ◆ Module 1: Intro to Tech Futures
- ◆ Module 2: AI & Data Science
- ◆ Module 3: Compute Power
- ◆ Module 4: Internet of Everything
- ◆ Module 5: Robotics & Automation
- ◆ Module 6: Cybersecurity
- ◆ Module 7: Fintech & Blockchain
- ◆ Module 8: Portfolio Strategy



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- ◆ Module 8: Portfolio Strategy

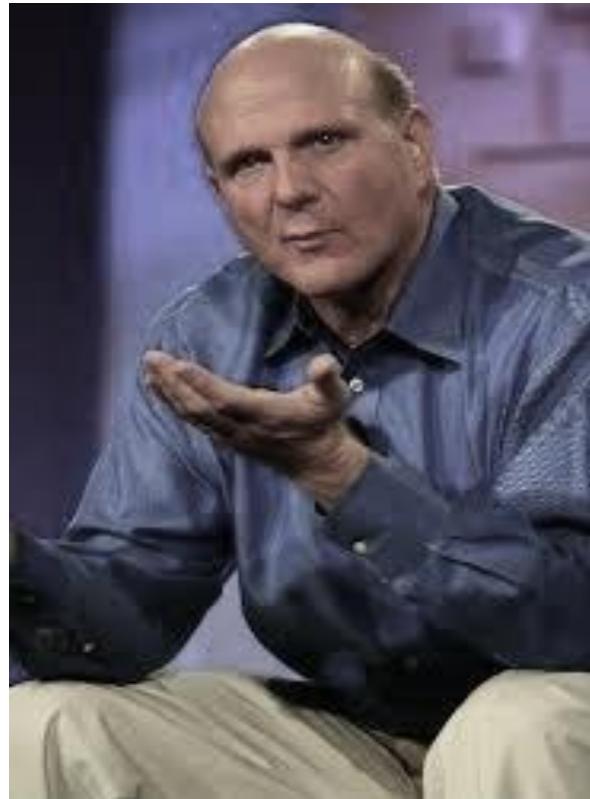


Course Overview

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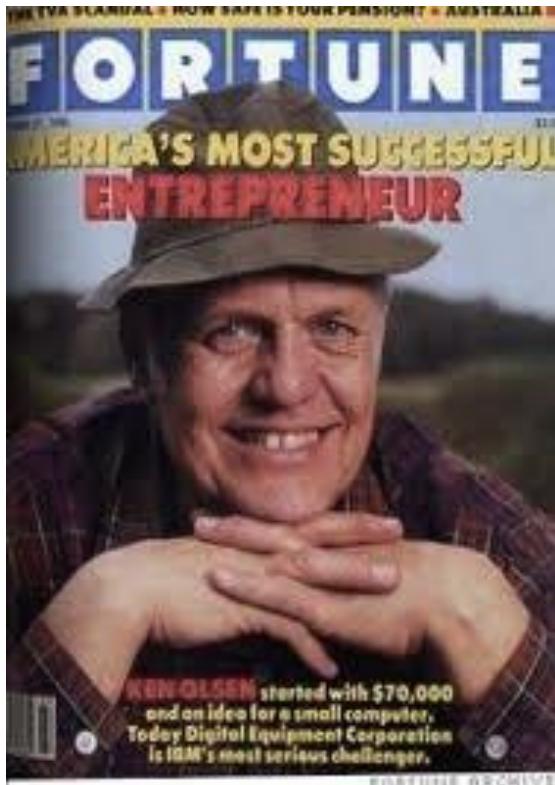
Video 4: Gartner's Hype Cycle (Part A)



“500 dollars? And no keyboard? Business people won’t like it.”



Steve Ballmer



“There is no reason for any individual to have a computer in their home.”

Ken Olsen

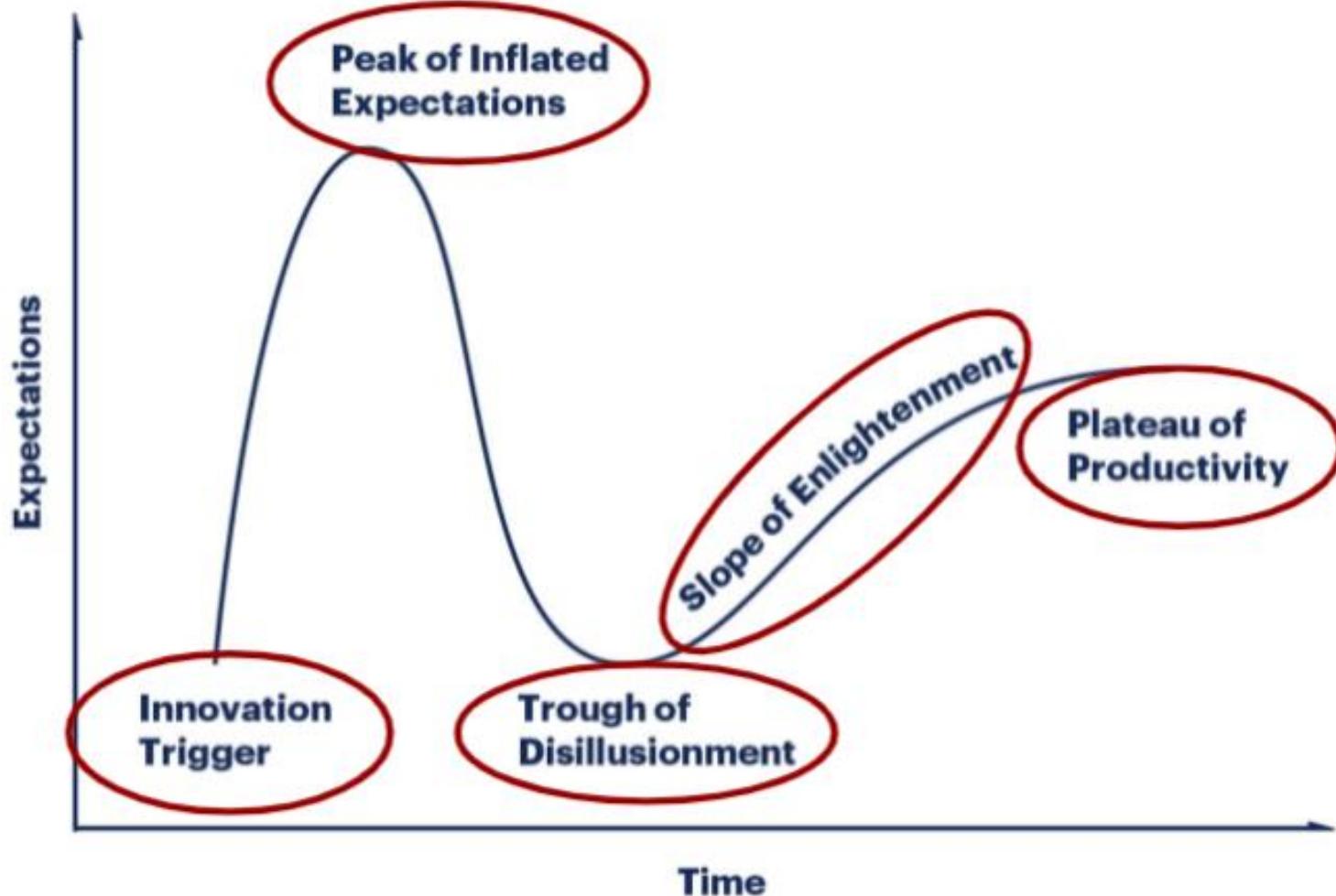


Sergey Brin

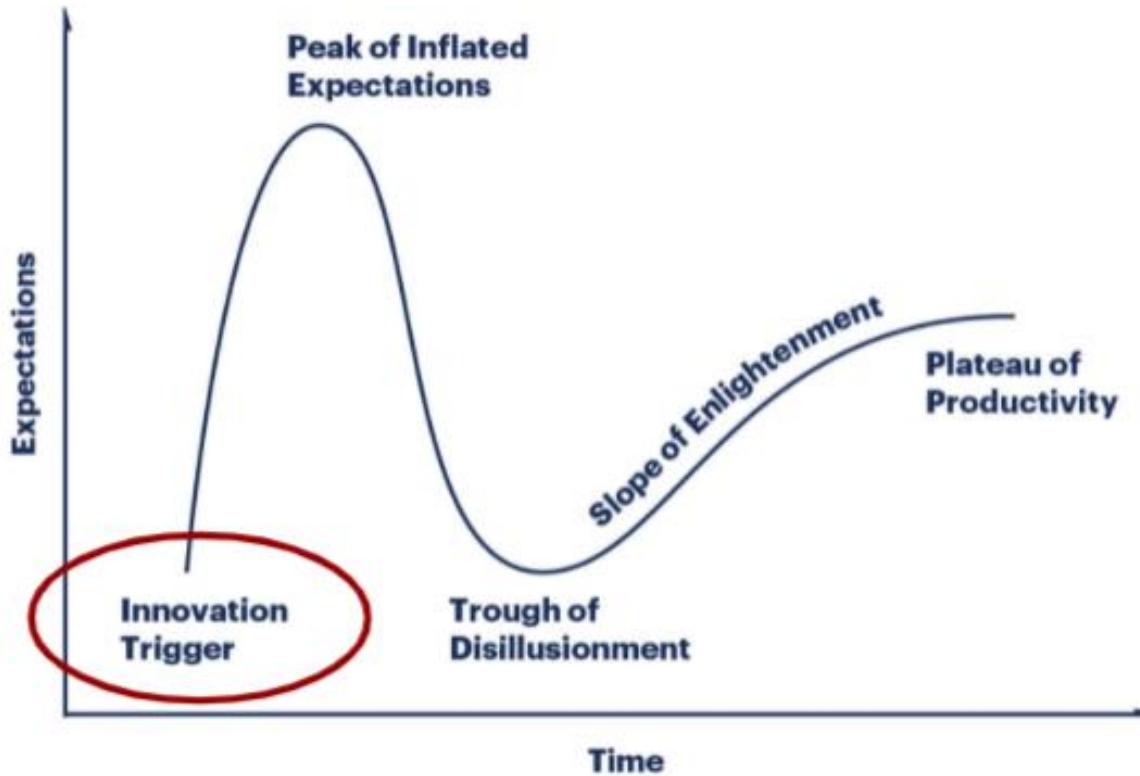
Google Class Enterprise Edition



Gartner's Hype Cycle

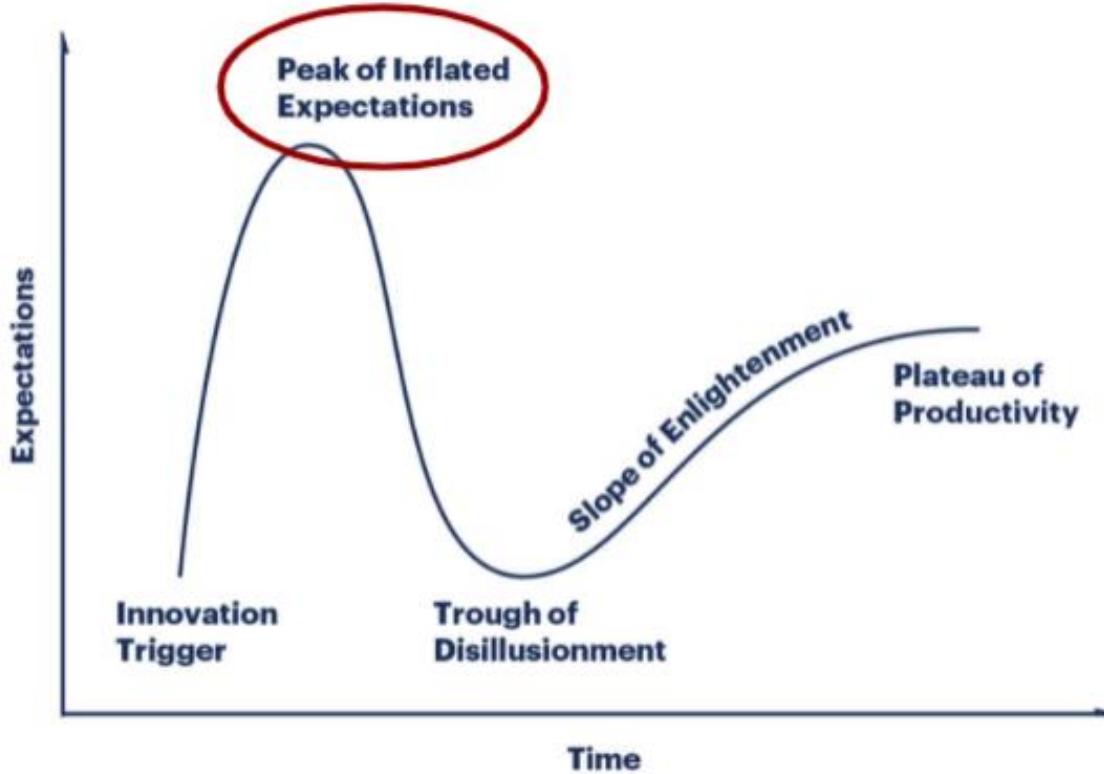


Step 1: Innovation Trigger



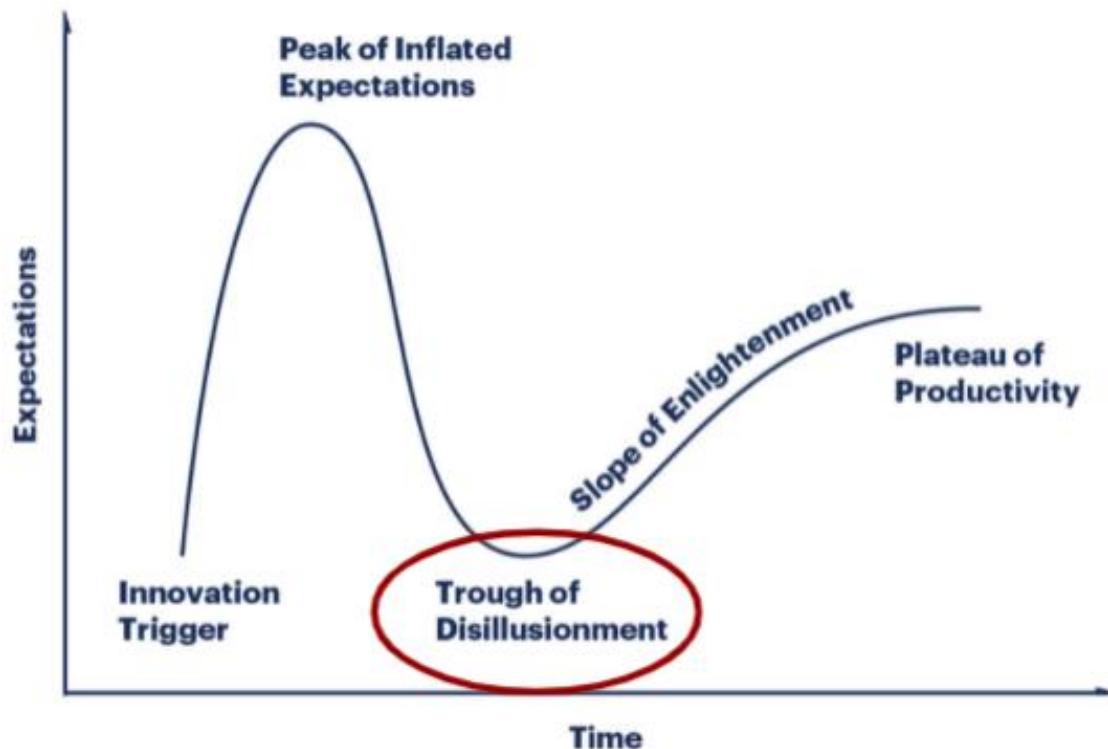
- ◆ New possibilities introduced by a new technology
- ◆ A rapid increase in expectations
- ◆ “AI is a breakthrough!”

Step 2: Peak of Inflated Expectations



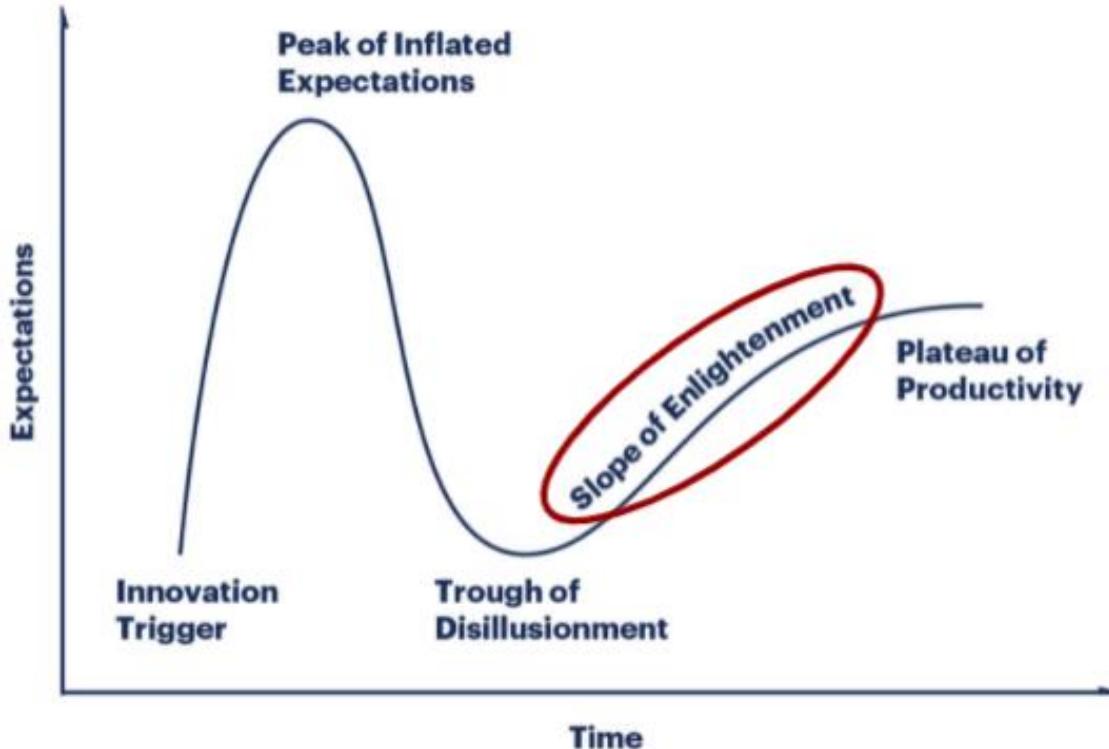
- ◆ Exaggerated expectations
- ◆ Too much “hype”
- ◆ “AI will change everything!”

Step 3: Trough of Disillusionment



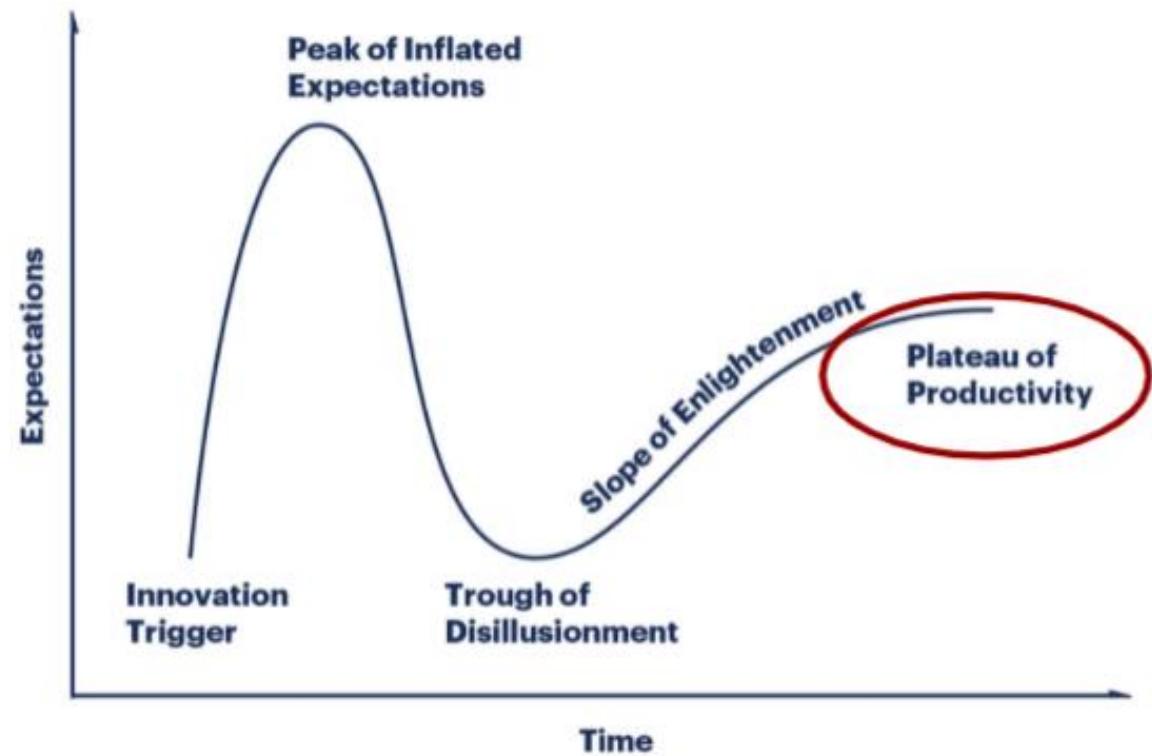
- ◆ “Hype” not fulfilled
- ◆ Falling expectations
- ◆ “AI is actually not so magical after all.”

Step 4: Slope of Enlightenment



- ◆ Building upon foundational value
- ◆ Real applications starting to emerge
- ◆ Rising expectations on what's achievable
- ◆ “AI is indeed useful in these cases.”

Step 5: Plateau of Productivity



- ◆ Technology is absorbed into everyday life
- ◆ Best practices are well-established
- ◆ "AI is an ordinary fact of life. Here is how we use it."

Video 5: Gartner's Hype Cycle (Part B)

Based on Gartner's Hype Cycle

- ◆ What level of effort should we invest in technologies at the stage of innovation triggers?



Build collaborative innovation partnerships



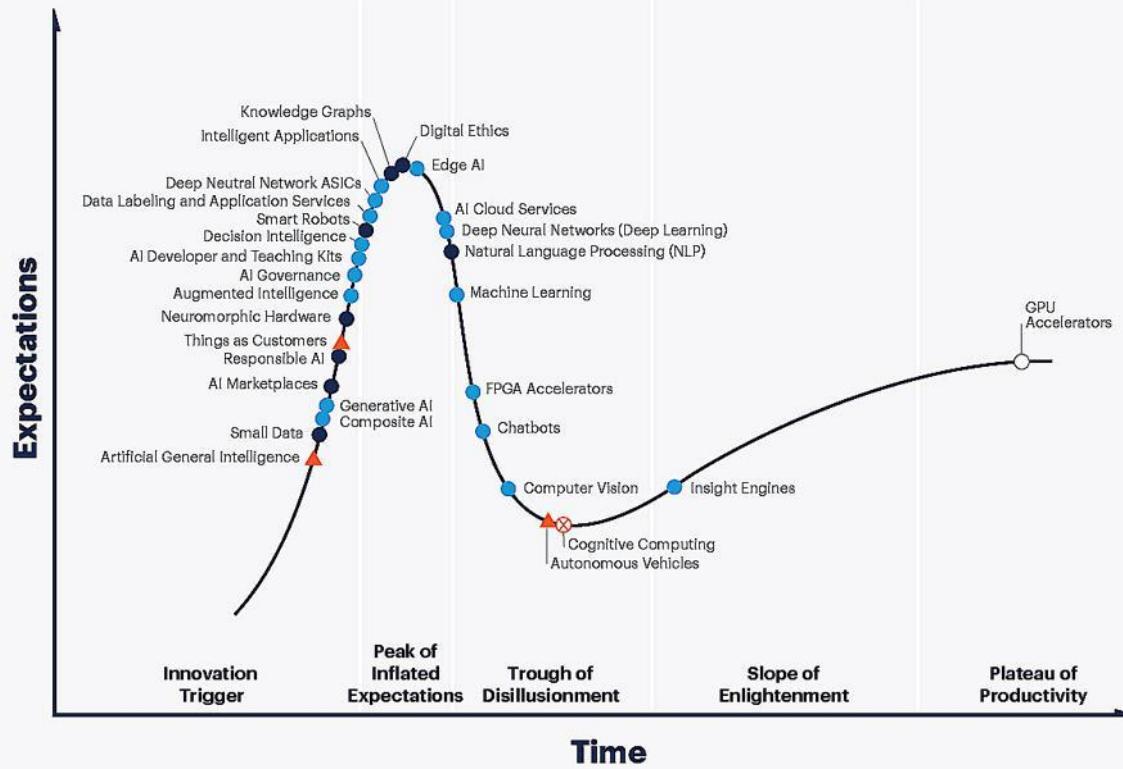
Explore competitive capacities in new tech spaces

Based on Gartner's Hype Cycle

- ◆ Should we start or continue to invest in technologies at the stage of inflated expectations?



Hype Cycle for Artificial Intelligence, 2020



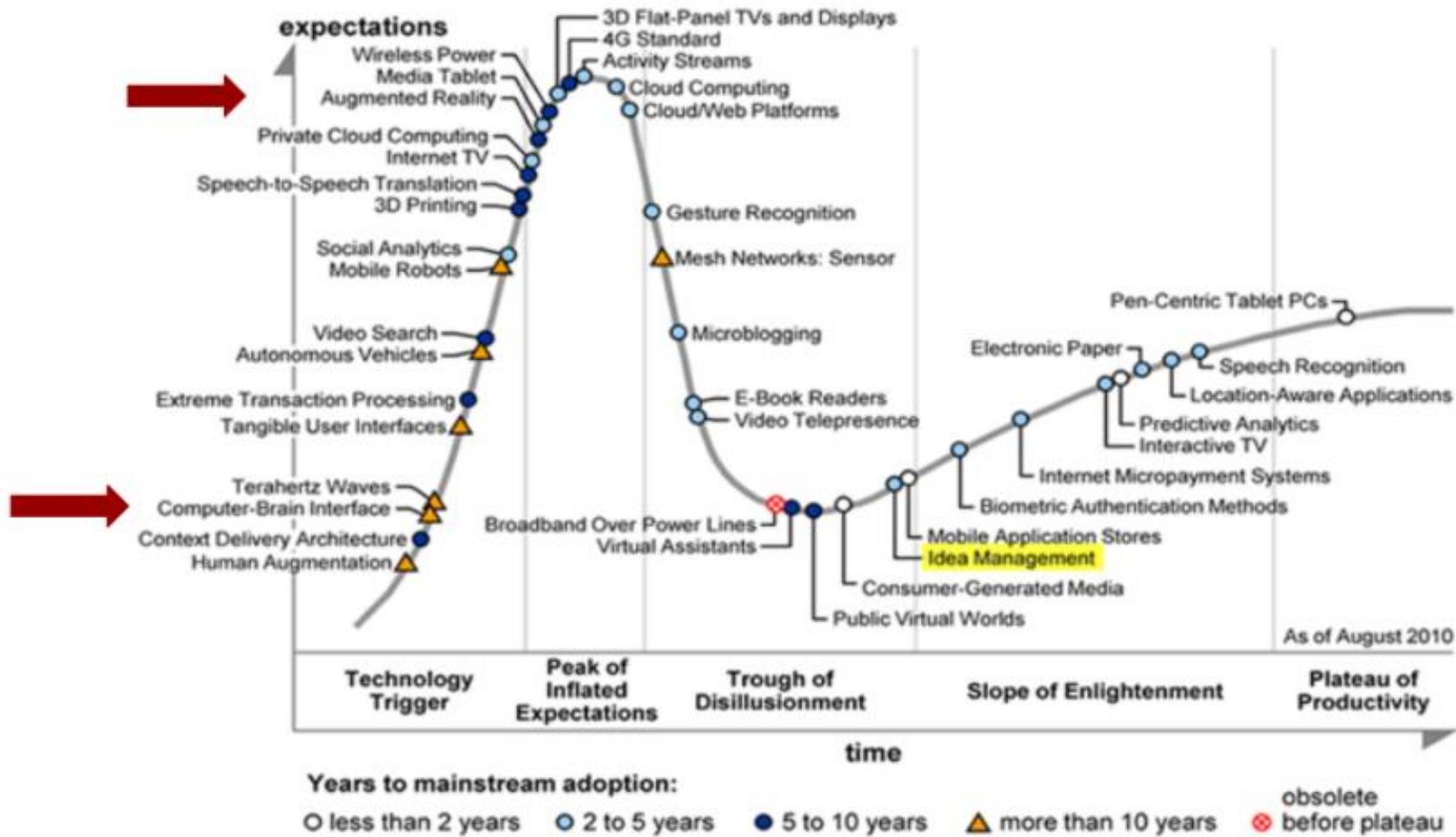
gartner.com/SmarterWithGartner

Source: Gartner

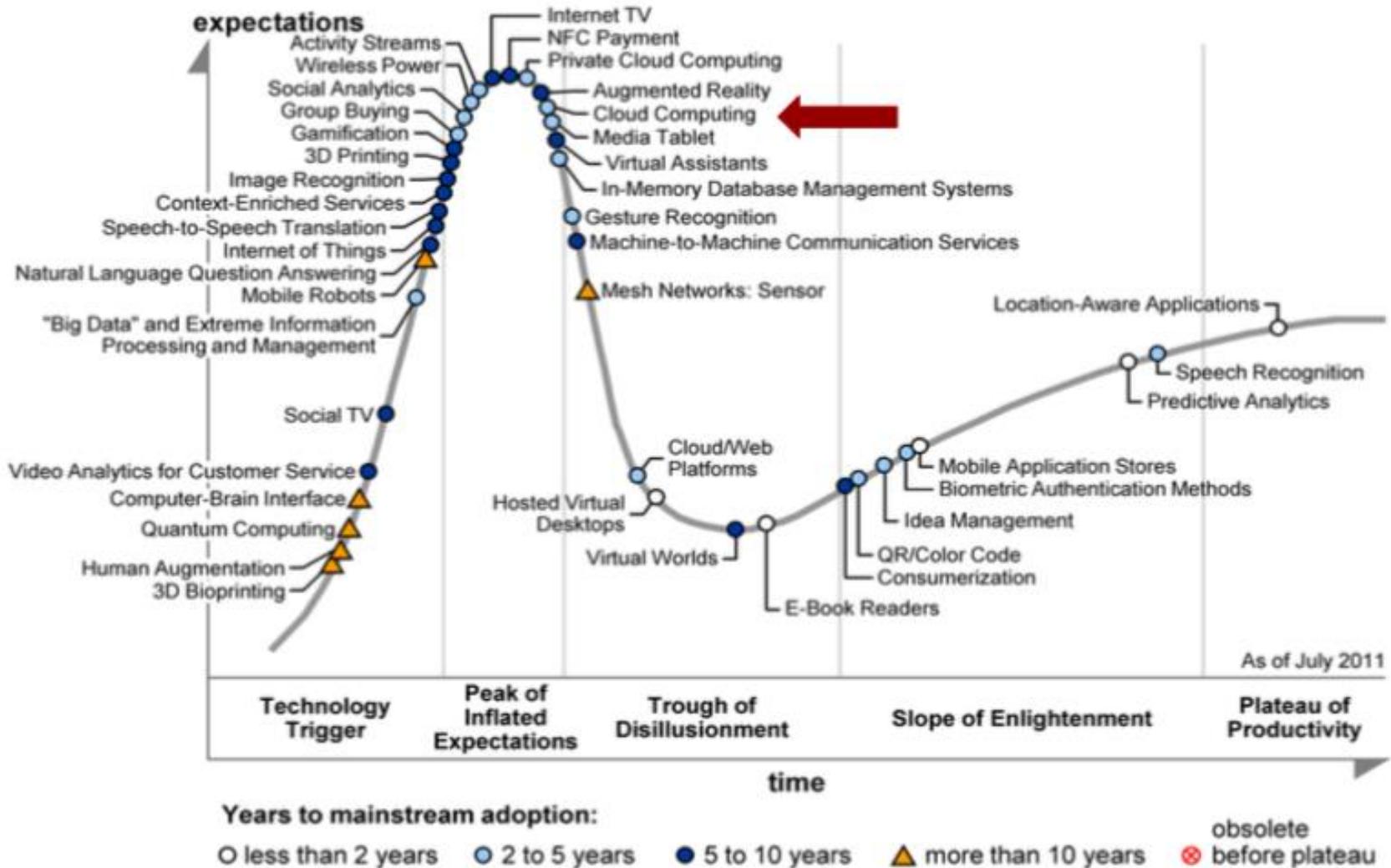
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Gartner

Gartner's Hype Cycle 2010



Gartner's Hype Cycle 2011

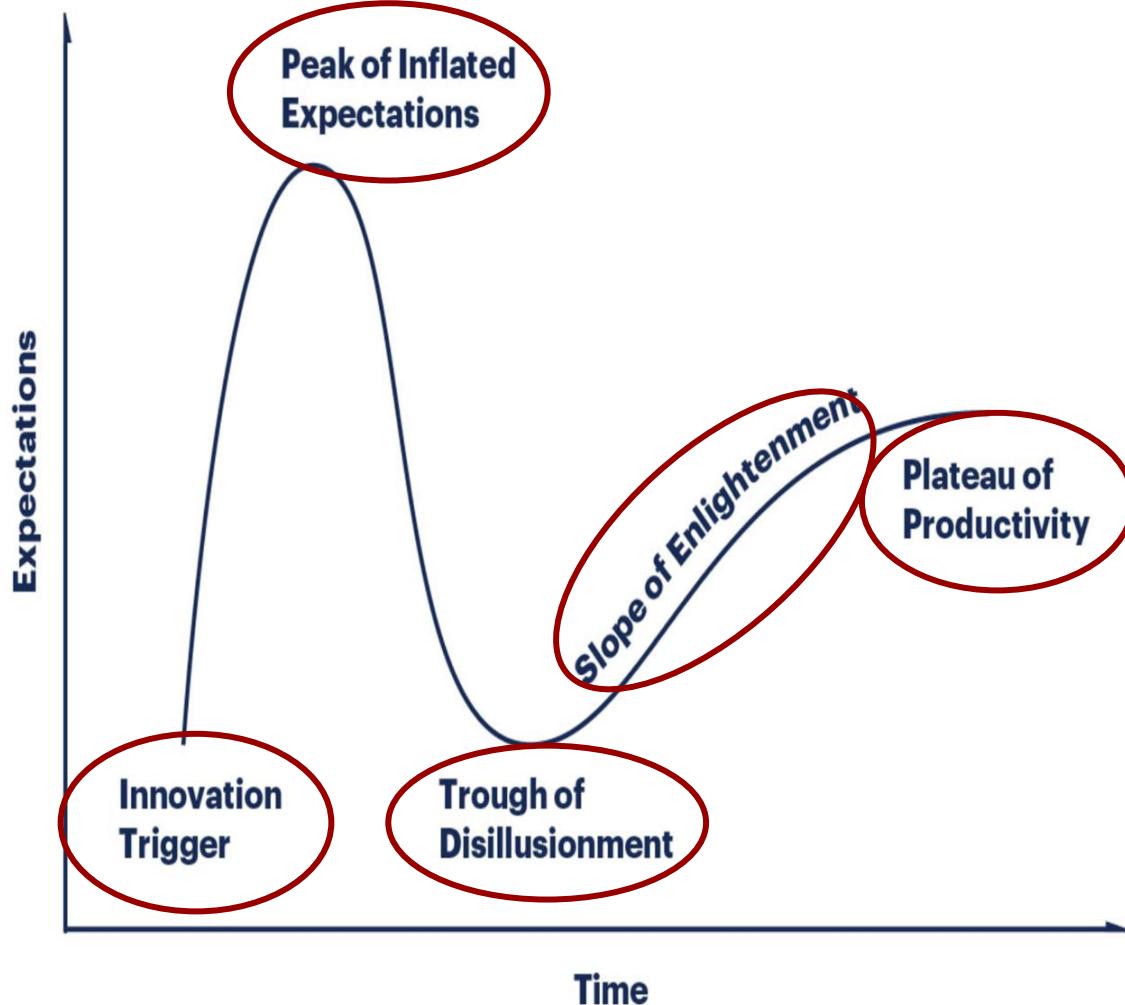


Gartner's Hype Cycle 2015

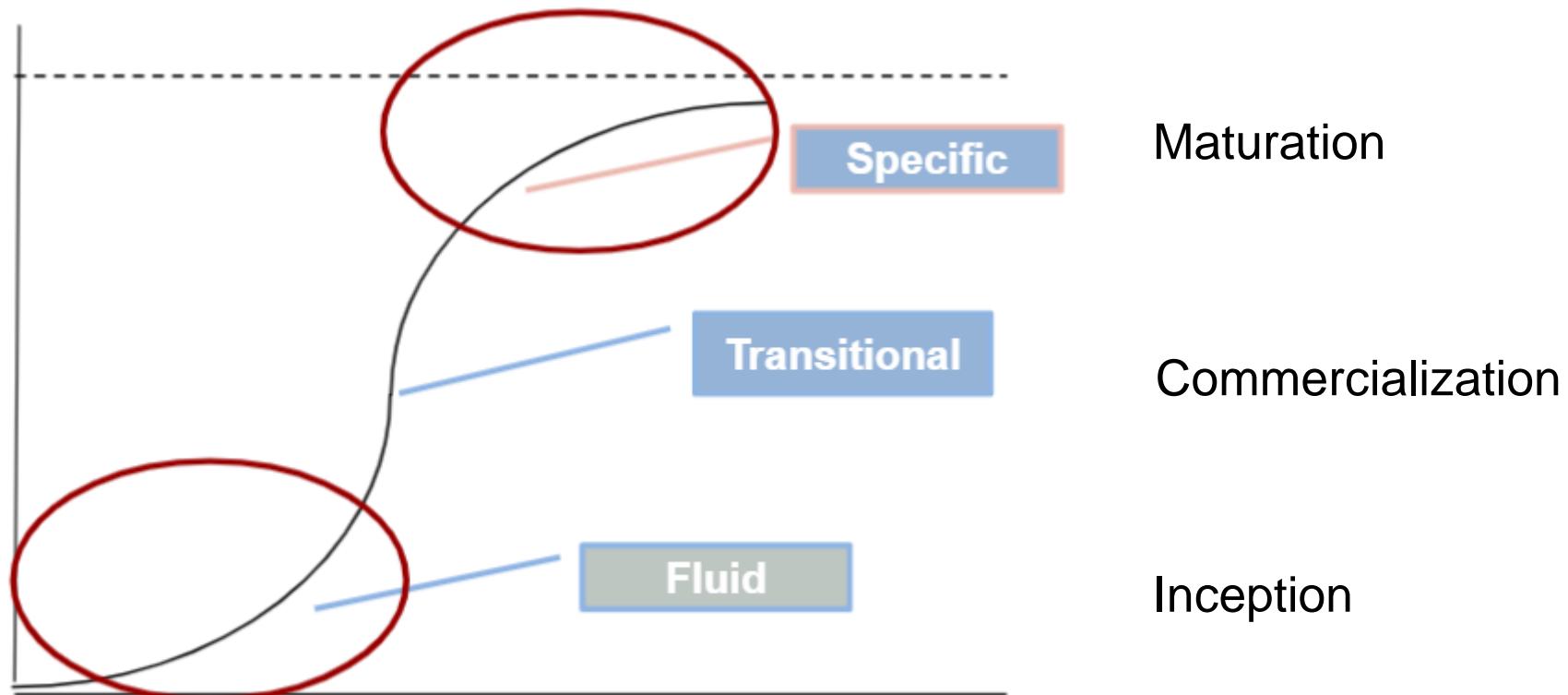


Video 6: What is an S-Curve?

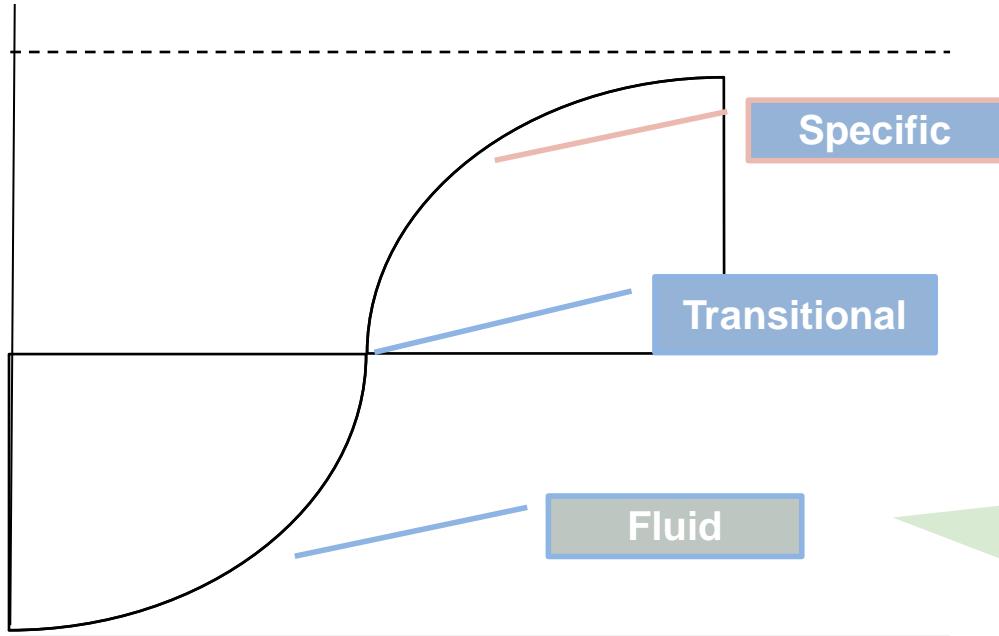
Gartner's Hype Cycle



S-Curve



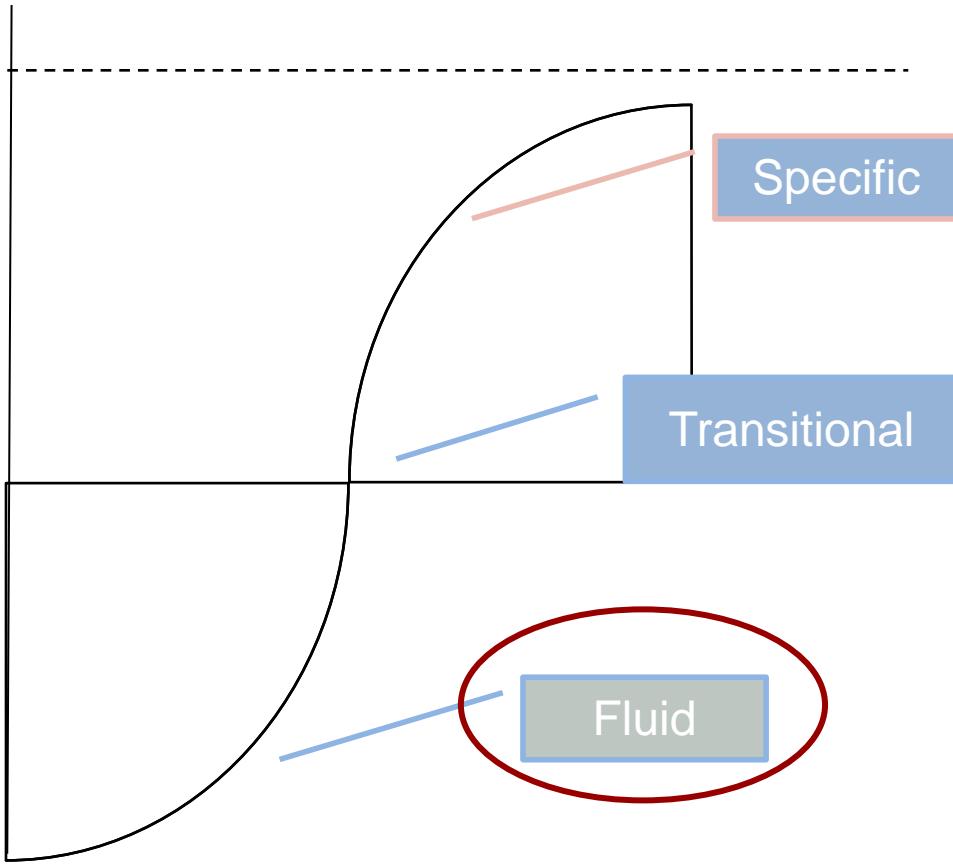
S-Curve



- Low level of effort is dedicated
- Innovation is poorly understood
- Small improvements are made

Video 7: Three Phases of S-Curve (Part A)

3 Stages of S-Curve





Toyota Prius



GM Volt

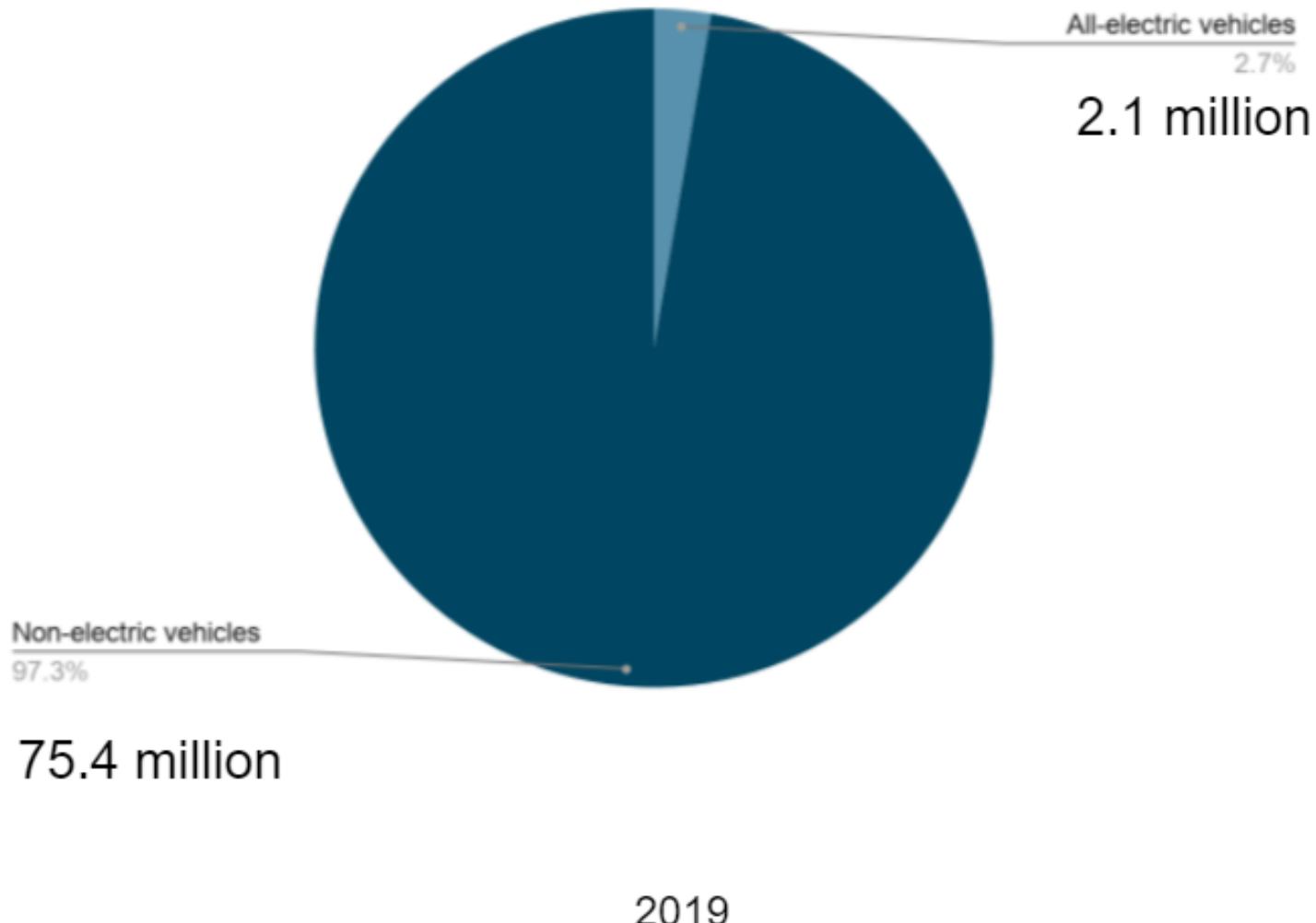


BMW i3



Nissan LEAF

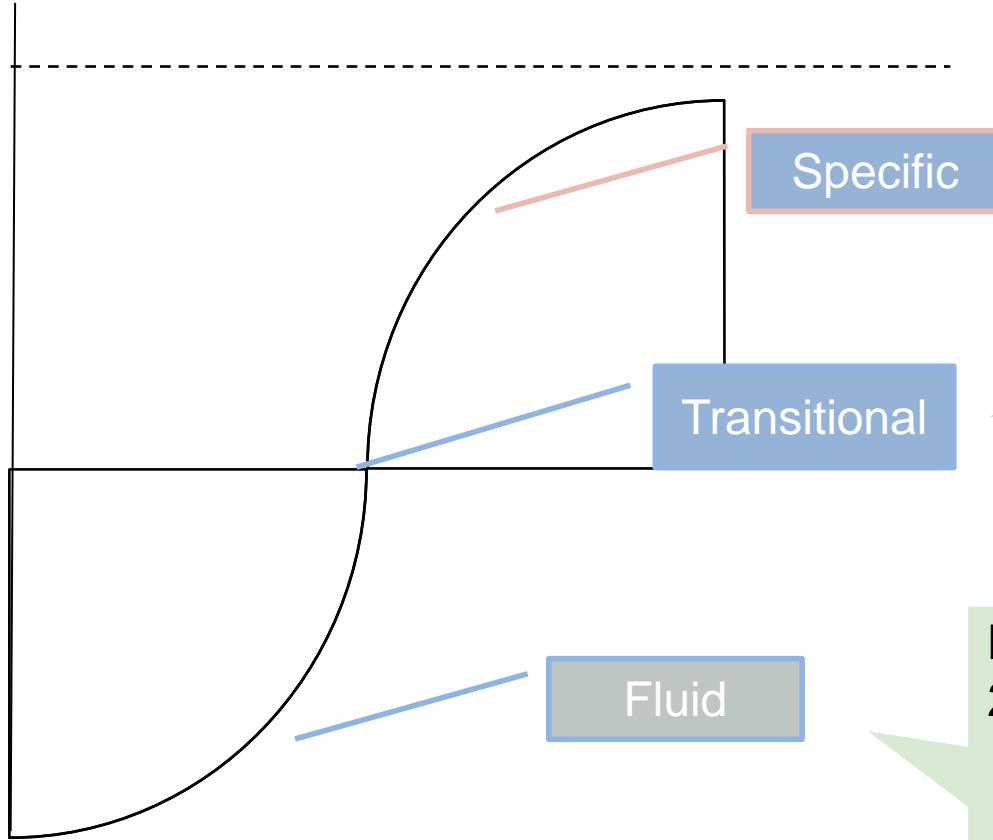
Global Car Sales



The Fluid Phase

- ◆ Expensive
- ◆ Narrow customer segments
- ◆ Limited performance

Tesla



Model 3 in
2019

- 250 miles
- \$35,000



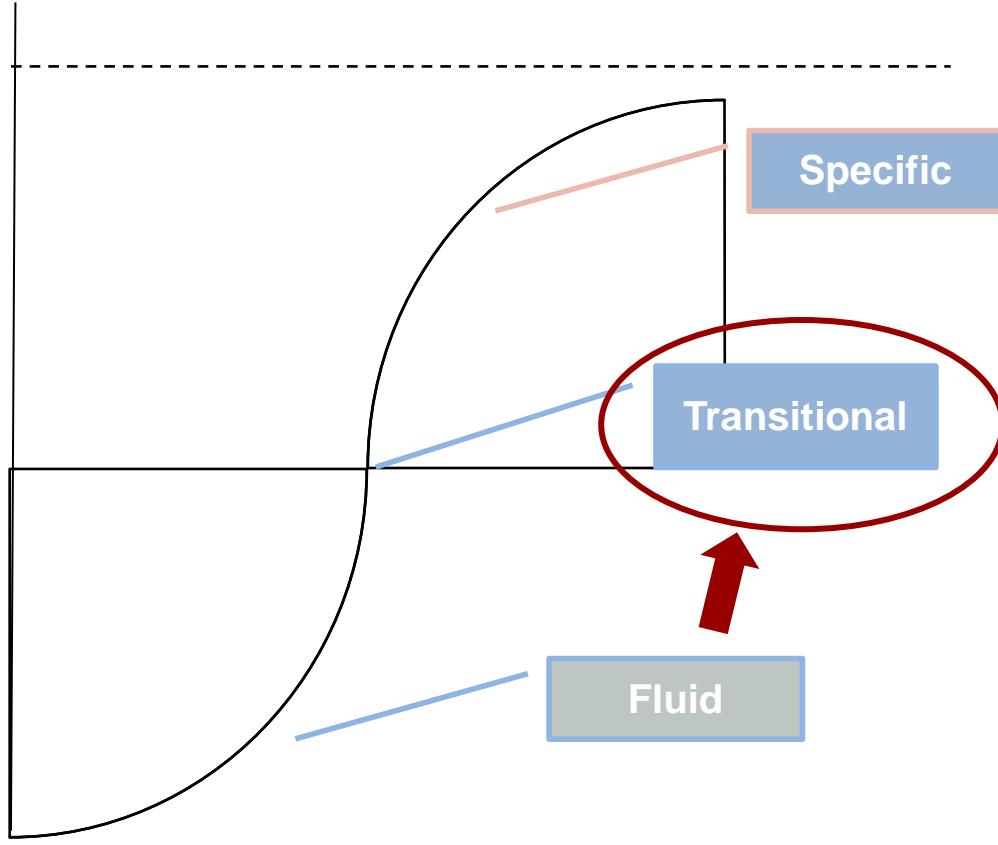
Model S in
2010

- 160 miles
- \$60,000



Video 8: Three Phases of S-Curve (Part B)

The Transitional Phase



- ◆ Market settles on standards
- ◆ Enables innovation and competition
- ◆ Critical to create defensive moat

Late Fluid Phase of Electric Vehicles



TOYOTA

SUZUKI



MAZDA



SUBARU



JAGUAR

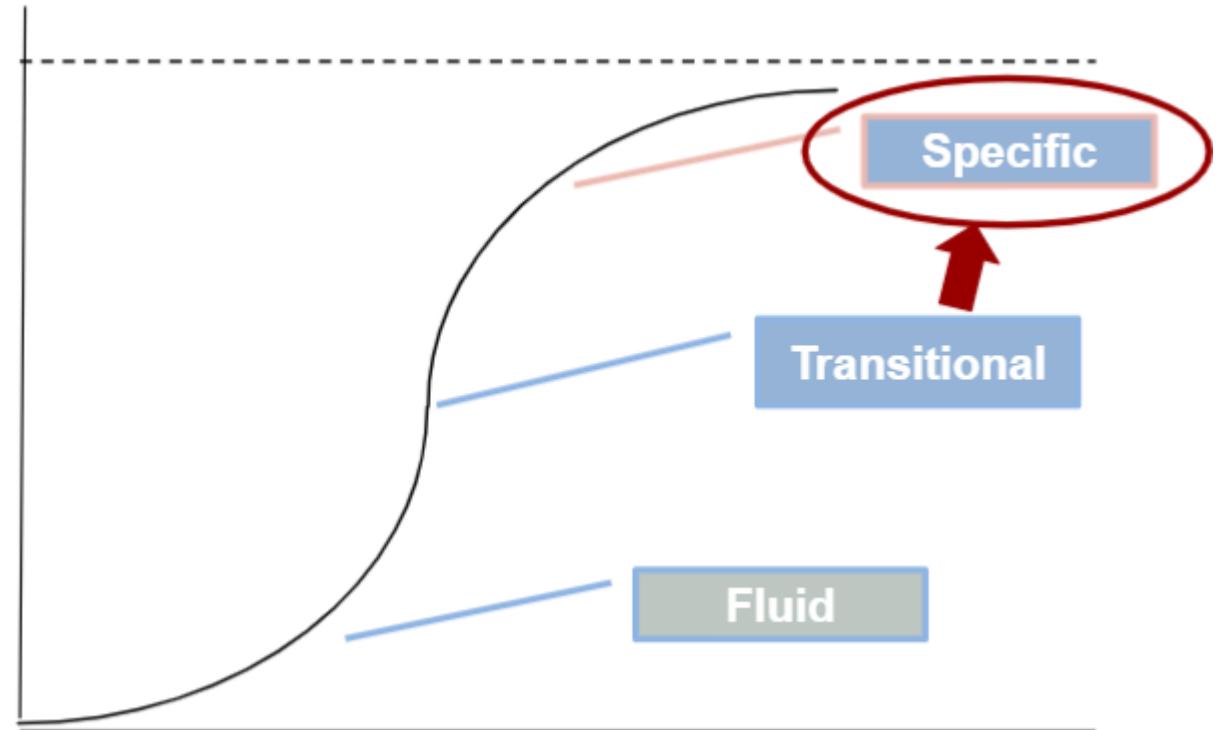


LAND ROVER



DAIMLER

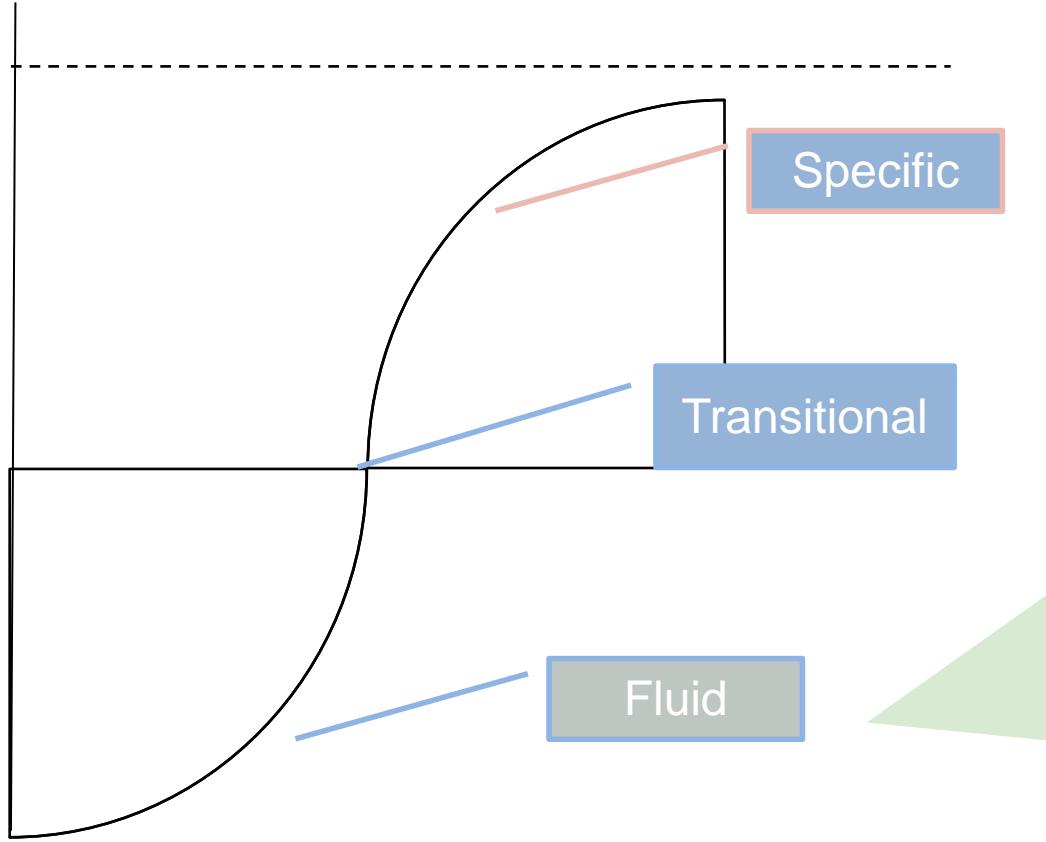
The Specific Phase



- ◆ Focus on scale and efficiencies
- ◆ Products mature
- ◆ Margins flatten out

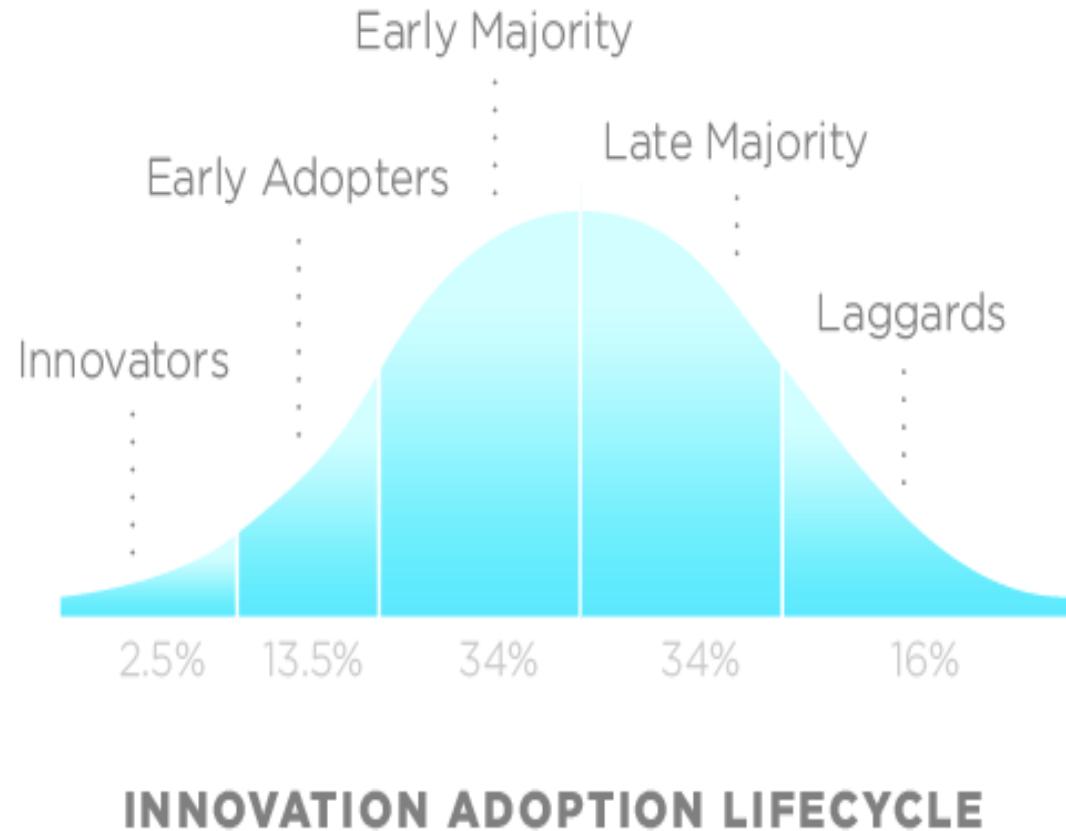
Video 9: Impact of S-Curve on Business Strategy

Implications for Business Strategy



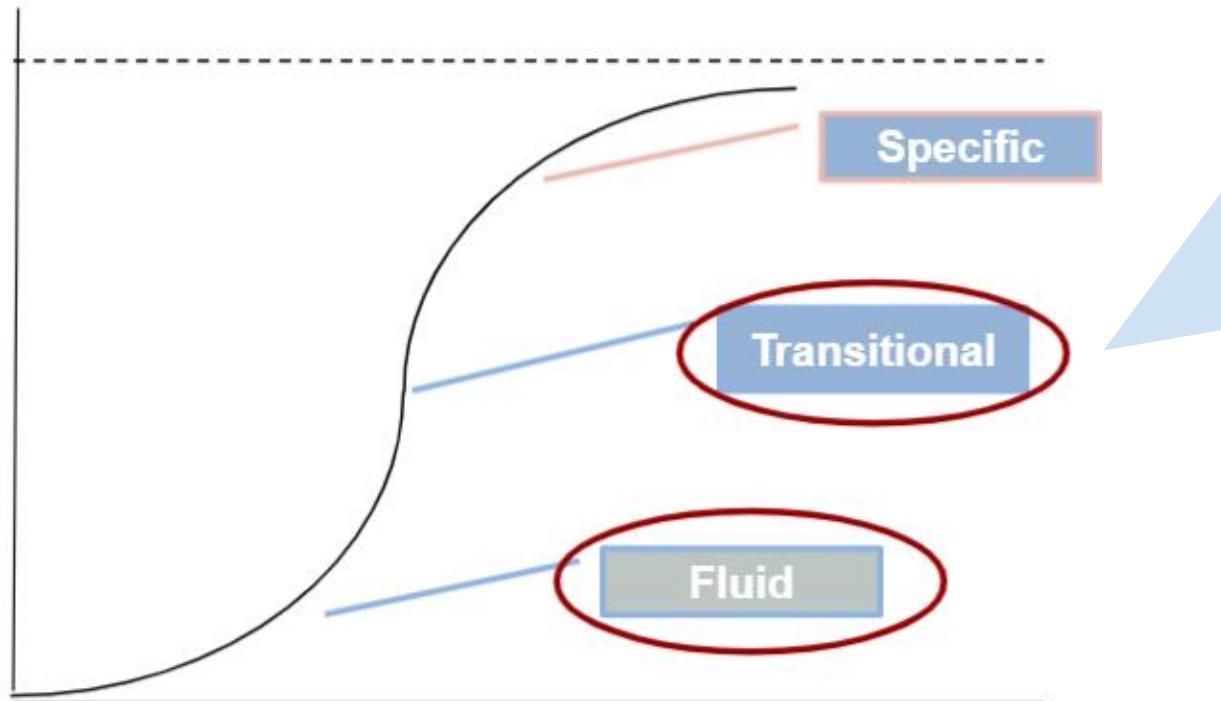
- Leave R&D focus open
- Figure out what sticks
- Be aware of challenges
 - External: uncertain market, long sales process, lack of ecosystem
 - Internal: unclear values, strategies, business models

Diffusion of Innovations



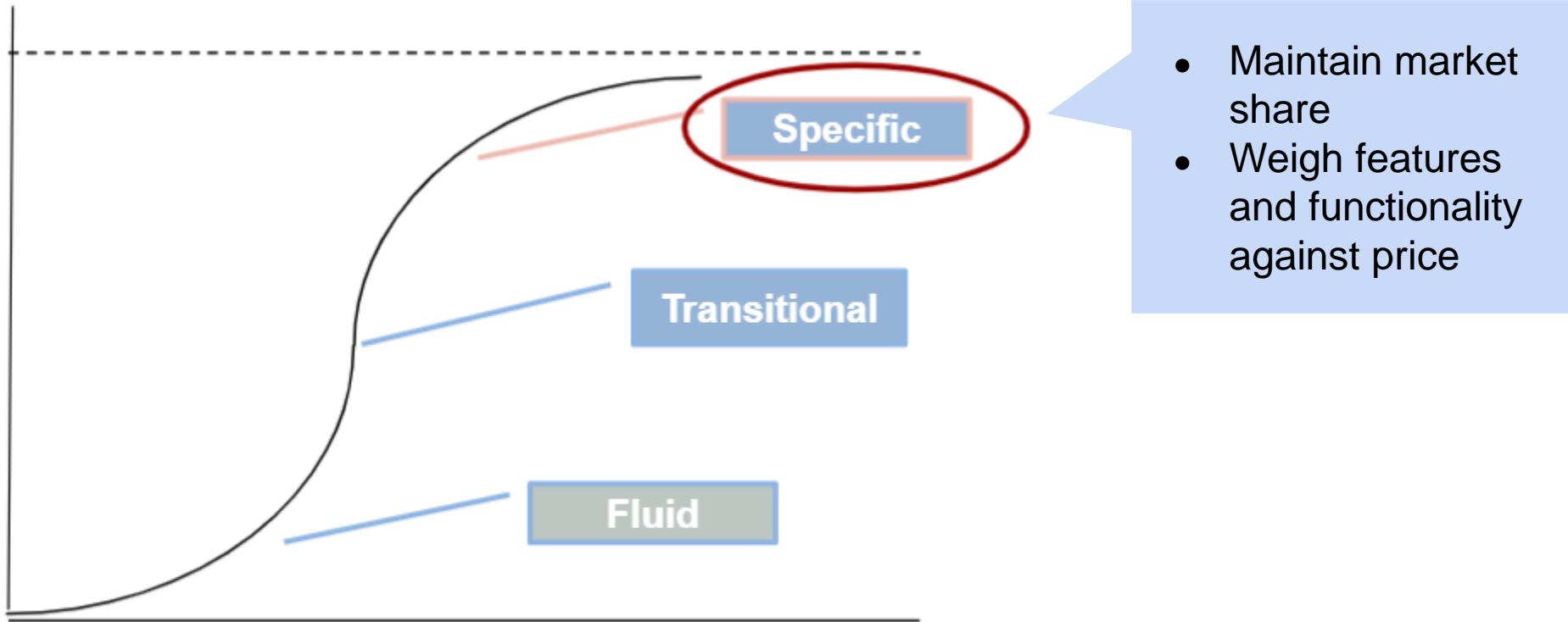
Everett Rogers

Implications for Business Strategy



- Adjust the innovation to be more tailored to the market
- Focus R&D efforts
- Be aware of competition around pricing
- See increased performance and growth

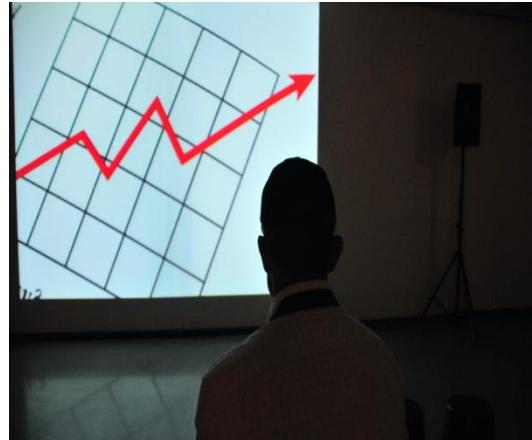
Implications for Business Strategy



Challenges in Transitional and Specific Phases



Retain the right leadership



Maintain growth momentum



Keep a close eye on competitors and suppliers

Video 10: Fly Over Tech Domains: AI, Data Science & Compute Power

Artificial Intelligence



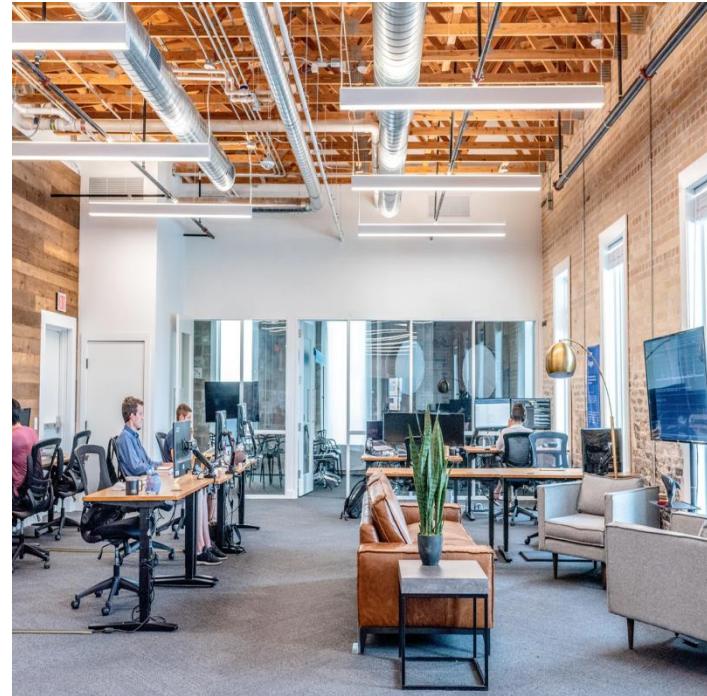
AI: Making Machines Smarter



Developing and Scaling AI



Rethink products and business
models

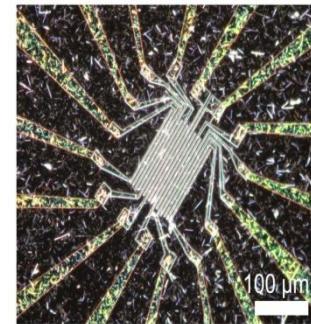
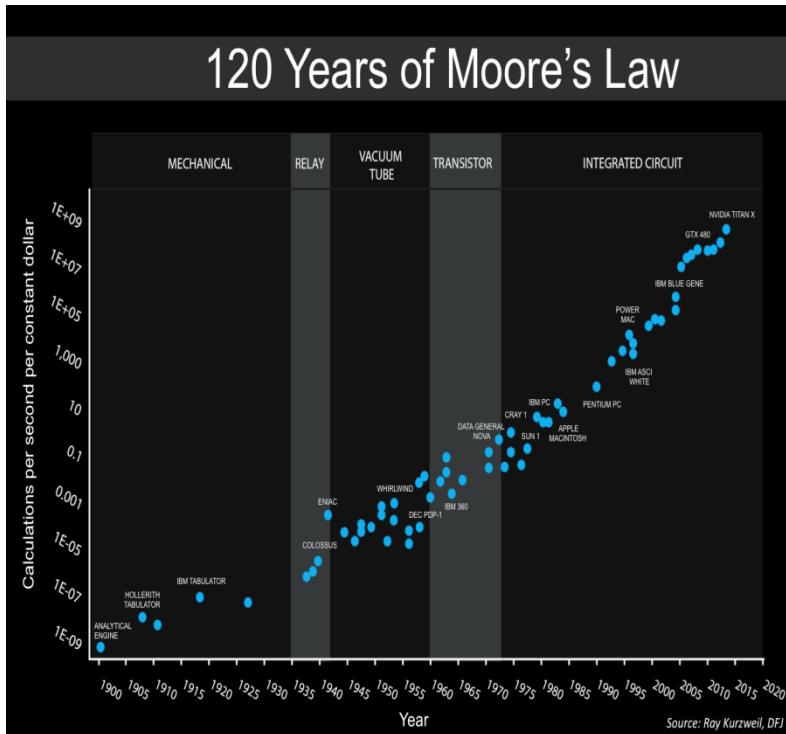


Redesign organizations

Compute Power



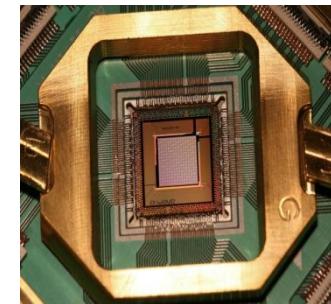
Semiconductors



ASICs



Neuromorphic chips



Q-bit technology

Quantum Computing



Cybersecurity



National security



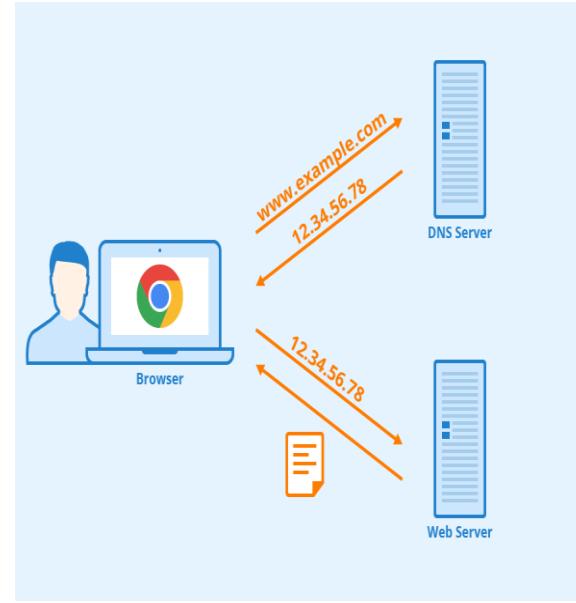
Satya Nadella

“The battle over quantum computing is “an arms race” as important as AI or virtual and augmented reality, though it has “gone largely unnoticed..”

Video 11: Fly Over Tech Domains: Internet of Everything, Robotics & Automation



75.44 billion devices
worldwide by 2025



IP addresses allow 340
trillion trillion trillion
devices to be connected

Internet of Everything (IoE)



Internet of Everything (IoE)



Improves efficiency and productivity



Creates innovation



Opens up new top-line opportunities

Robotics & Automation

A screenshot of a computer monitor displaying a travel agency software interface titled "TOURiSD Dashboard". The screen is divided into two main sections: "Upcoming tours" and "Next day services".

Upcoming tours

Tour number	Name	Start date	Days	Due
151010235	Boeing ID: 853114624	2015-10-19	5	2
151015782	New commission Boeing ID: 021889660	2015-10-19	5	2
151015782	New commission Boeing ID: 021889660	2015-10-22	2	5
151015234	New commission Boeing ID: 021889660	2015-10-22	2	5
1509233781	Barge-tour Alexander the Great Tour Tr - Is -	2015-10-25	10	8
141119188	Albania & Dalmatian Islands	2015-10-31	8	14
150324483	BERICO GLOBAL, NDS Albania, Macedonia	2015-11-02	3	16
150324483	Study Tours - Fall trip to Albania/Uncavelia nrg	2015-11-03	5	17
151017888	Hofft Tour in Albania	2015-11-17	4	31

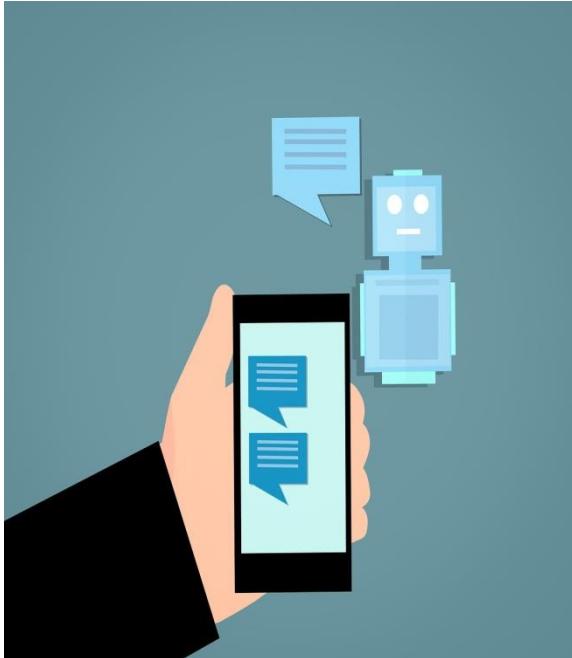
Next day services

Day	Status	Time	Service	Ac.	Tour Name	Tour Nr	Description
16	(Not booked)	18:00 - 00:00	Hotel Porto Eda 2*	OUR	22 Days Private Tour Albania	1504081502	Dinner and overn.
16	(Not booked)	18:00 - 00:00	Hotel Porto Eda 2*	OUR	22 Days Private Tour Albania	1502923229	Dinner and overn.
9	(Not booked)	07:45 - 08:00	Mihai Toda	LOC	Albatus 14 - Alexander the Gr	1502920380	Meeting with your
9	(Not booked)	08:30 - 10:00	Castle of Kruja	ENTH	Albatus 14 - Alexander the Gr	1502920381	Entrance to Castle
9	(Not booked)	10:00 - 11:00	Scandinav.Museum	ENTH	Albatus 14 - Alexander the Gr	1502920382	Visit of the Scandi
9	(Not booked)	11:00 - 12:00	Etnographic.Muse	ENTH	Albatus 14 - Alexander the Gr	1502920383	Visit of the Ethno
9	(Not booked)	13:00 - 14:00	Scandinav.Vineer	ENTH	Albatus 14 - Alexander the Gr	1502920384	Vineer tasting at
15	(Not booked)	18:00 - 00:00	Hotel Porto Eda 2*	OUR	22 Days Private Tour Albania	1504081502	Dinner and overn.

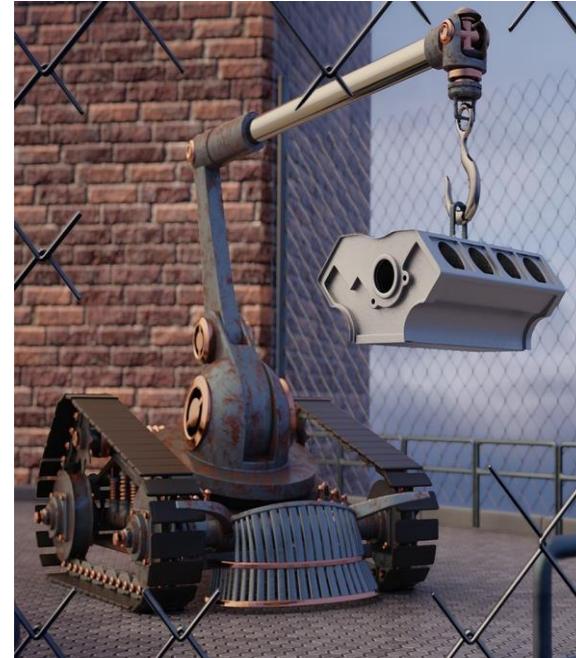
Reservations for upcoming tours up to 90 days

Status	Service	Supplier	Tour number	Tour name	Start date	Days	Action	Action date	Week day	Action time	Response ...
Inquiry	Private car, small minivan 5+1		1504081502	22 Days Private Tour Albania	03/10/2015	22	COACH	03/10/2015	Saturday		
Declined	Shoosh of weapons		1504081502	22 Days Private Tour Albania	03/10/2015	22	BS	19/10/2015	Friday	12:30 - 13:00	
Inquiry	Naum Naumesti		1509233781	Barge-tour Alexander the Great Tour T...	29/10/2015	19	LOCAL GUIDE	29/10/2015	Wednesday	08:30 - 08:45	
Inquiry	Double room... Vila Adria Hotel 4*		150324483	Study Tours - Fall trip Albania/U.kancel...	03/10/2015	5	OUR	03/10/2015	Tuesday	20:30 - 00:00	
Inquiry	Single room... Vila Adria Hotel 4*		150324483	Study Tours - Fall trip Albania/U.kancel...	03/10/2015	5	OUR	03/10/2015	Tuesday	20:30 - 00:00	
Inquiry	Standart do... Vila Adria Hotel 4*		150324483	Study Tours - Fall trip Albania/U.kancel...	03/10/2015	5	OUR	03/10/2015	Tuesday	20:30 - 00:00	
Confirmed	Scandinav.Museum		150324483	Study Tours - Fall trip Albania/U.kancel...	03/10/2015	5	SS	03/10/2015	Tuesday	16:15 - 18:00	
Confirmed	Entrance Fee Natural Historical Museum of Tirana		141114719	Albania - Montenegro - Dubrovnik 8 day...	23/12/2015	8	SS	23/12/2015	Tuesday	11:00 - 12:00	
Declined	Double room... Hotel Arka 4*		141114719	Albania - Montenegro - Dubrovnik 8 day...	23/12/2015	8	OUR	23/12/2015	Wednesday	20:30 - 00:00	

Software Robots



Hardware Robots



Video 12: Fly Over Tech Domains: VR/AR, BCI/BMI, Fintech & Blockchain

VR

Virtual Reality



AR

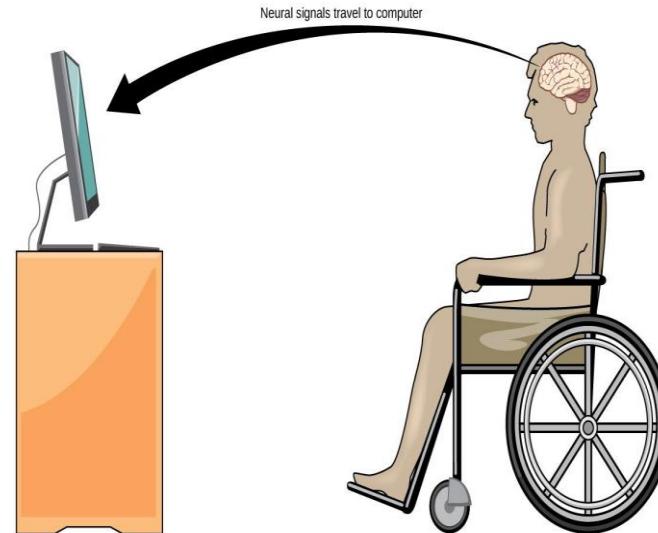
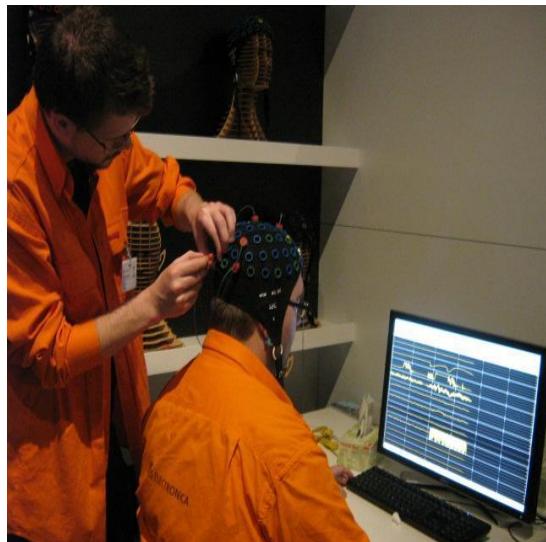
Augmented Reality



Non-invasive

BCI/BMI

Brain-Computer Interface/Brain-Machine Interface



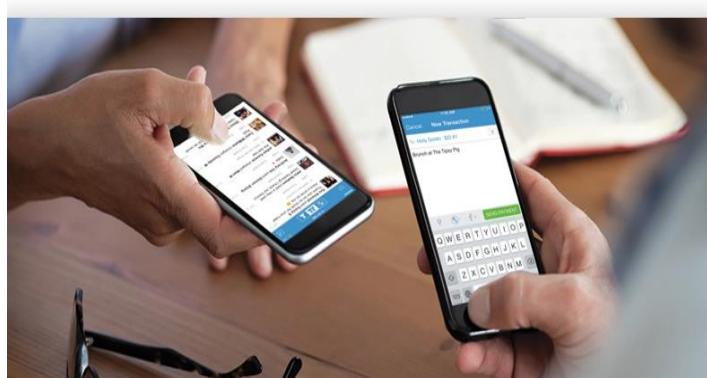
BCI/BMI

Brain-Computer Interface/Brain-Machine Interface



Fintech

venmo



The image displays the Wealthfront mobile application interface on the left and a purple-themed marketing graphic on the right.

Wealthfront

Passive investing on autopilot.

My Personal Account

\$50,673
▲ 0.4% TODAY'S RETURN

50K
\$25K
15K

2017 2018 2019 All Time

11.7% MONEY-WEIGHTED 10.1% TIME-WEIGHTED

YOUR INVESTMENT STRATEGY

Tax-Loss Harvesting, Stock-level Tax-Loss Harvesting, Smart Beta, and Risk Parity

Our full suite of strategies that aim to maximize returns without more risk.

Fintech IPOs



أرامكو السعودية
saudi aramco



Decentralized Finance (DeFi)

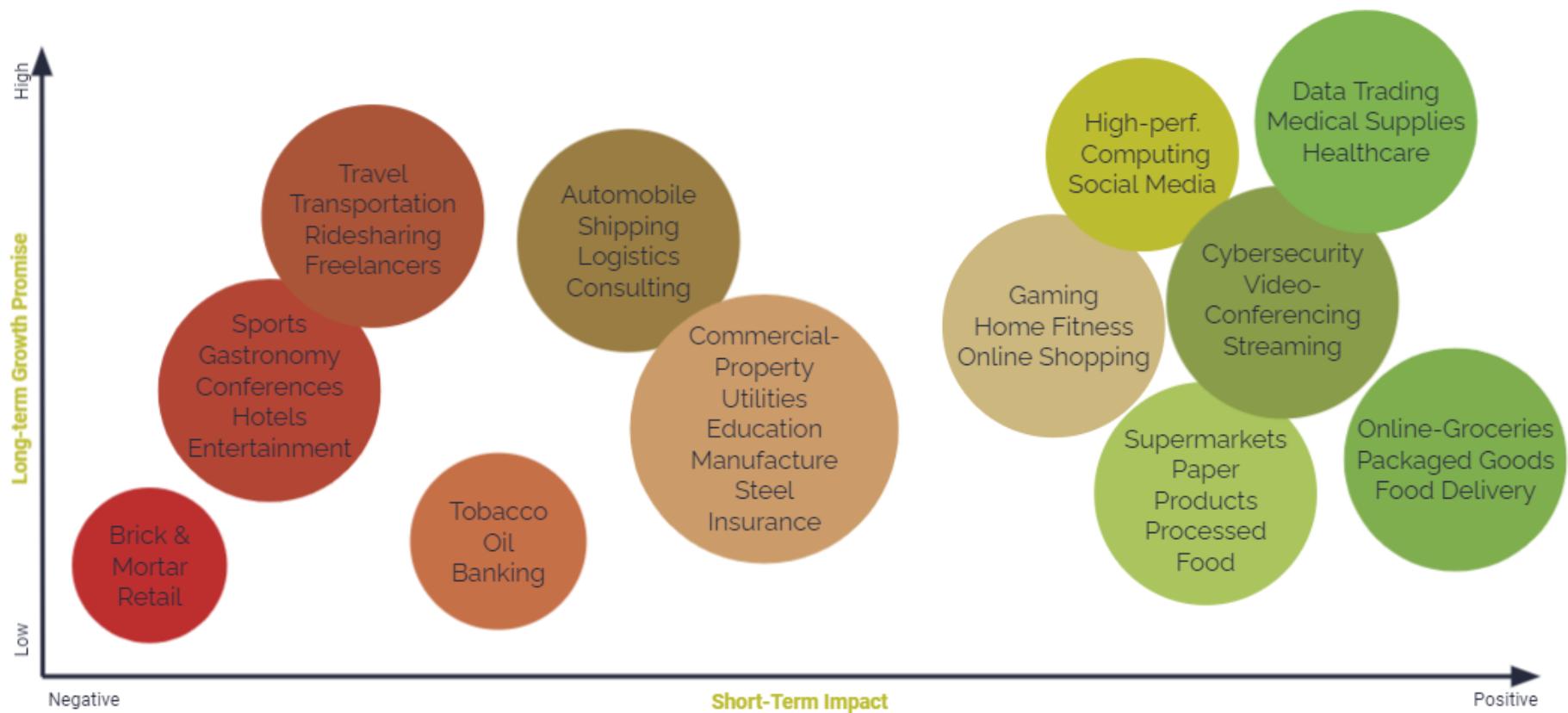
- ◆ Decentralized financial instruments
- ◆ Don't rely on banks or traditional currencies
- ◆ Use blockchain and cryptocurrencies

Market Growth of Cryptocurrencies



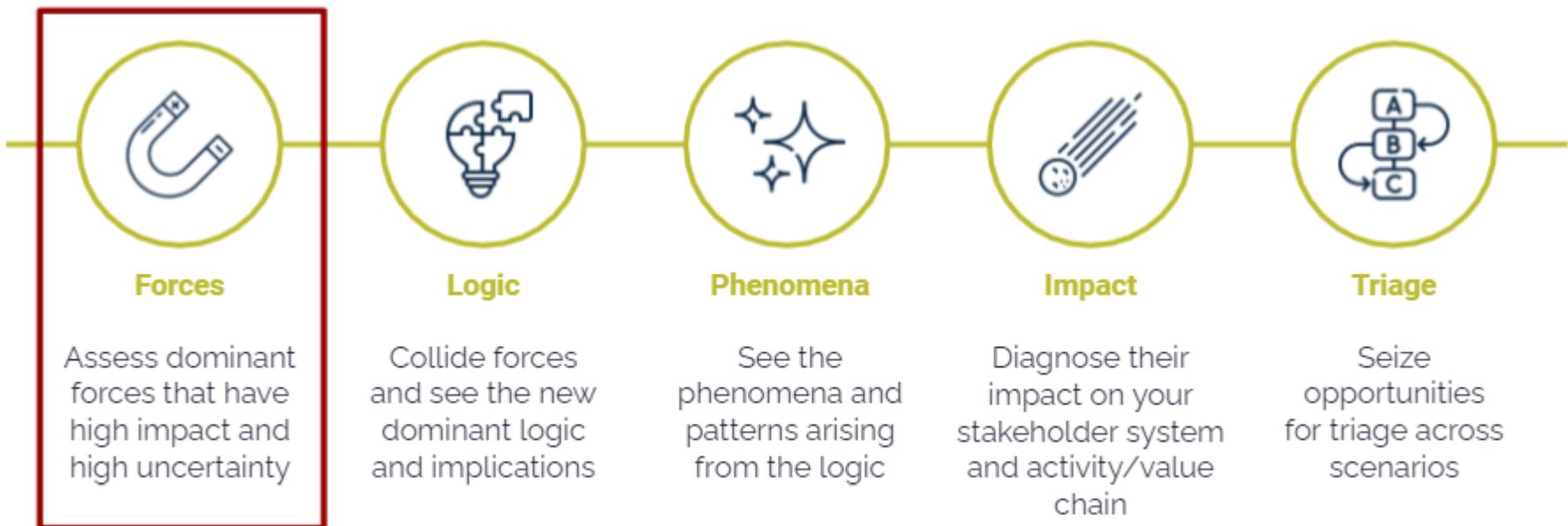
Video 13: FLP IT Model: An Introduction

Impact of COVID-19 on Economy



FLP IT Model

Five steps to resilience



Forces

Mortality
Rate of the
Virus

Time to Vaccine
Found and
Produced at
Scale

Degree of
Solidarity in
Countries

Capacity of
Societal
Institutions to
Coordinate
Effectively

Degree of
Coordination
between
Countries

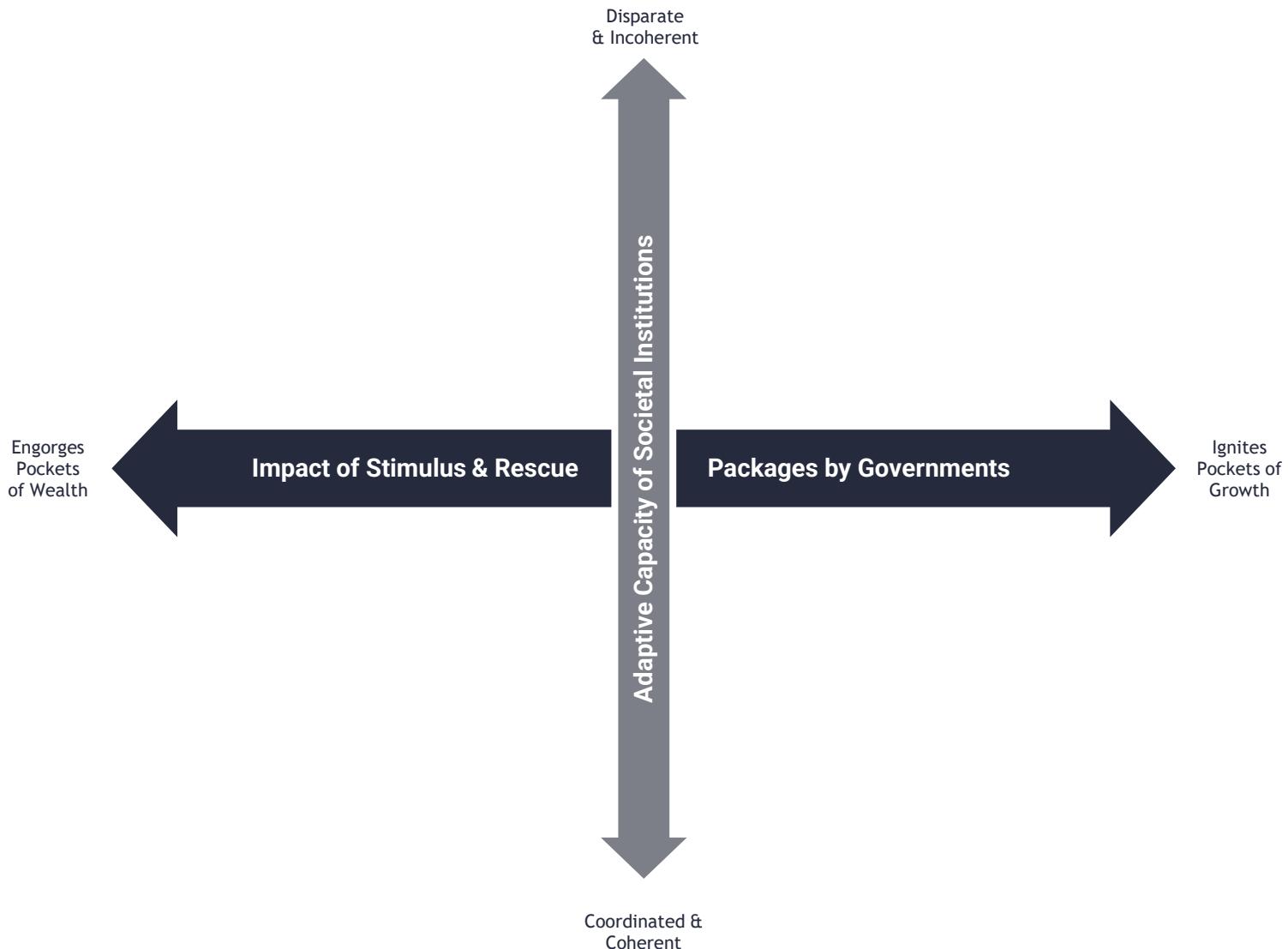
Impact of
Lockdowns on
the Economy

Impact of Stimulus
/ Rescue-packages
(SMEs & Local Gov.)

Rate of
Innovation by
Startups
(antifragile)

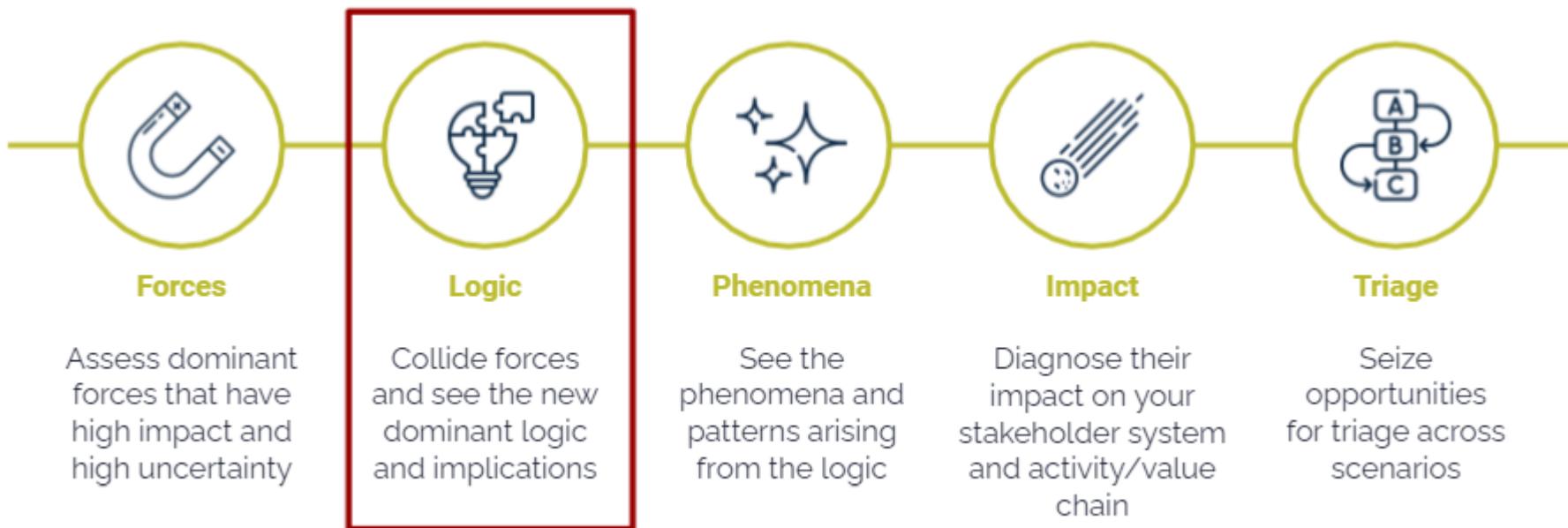
Rate of Adoption
of New Virtual or
Hybrid Business
Models

Affordability
of Tech Solutions
for Pinchpoints



FLP IT Model

Five steps to resilience

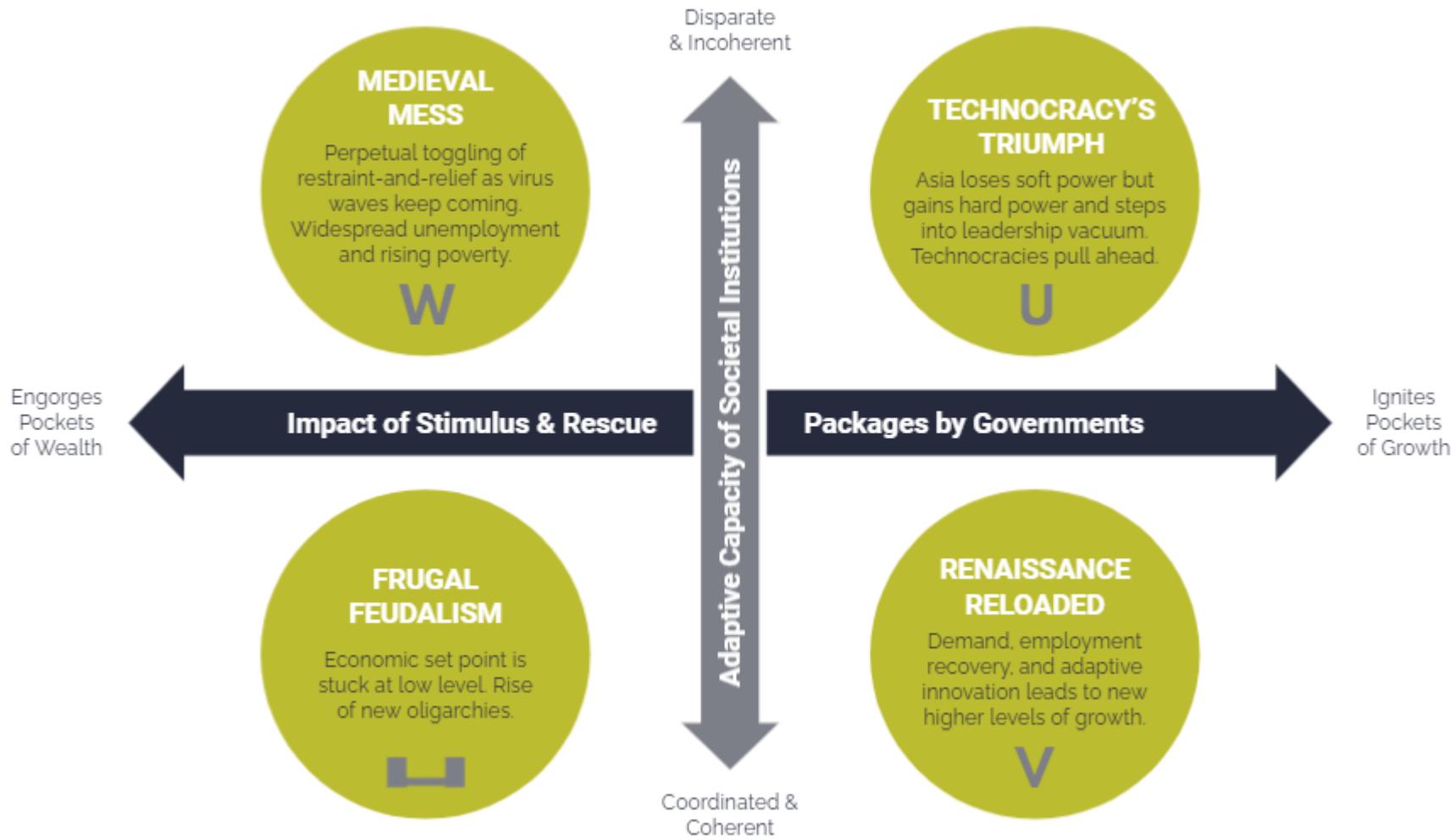


STEEP~~M~~ Forces

Social
Technological
Economic
Environmental
Political
Legal
Ethical
Military

Video 14: Four Potential Future Scenarios

Future Logics





Virus waves keep coming

Economies experience on-and-off cycles

Disruption of business models

Inequality grows

Unemployment and poverty rise



TECHNOCRACY'S TRIUMPH

Asia gains hard-power

Countries stimulate the economy at different speeds

China steps into global leadership due to tight rule enforcement

US and EU have recessions



FRUGAL FEUDALISM

Economic set point is stuck at low level

Countries collaborate to suppress the virus

Misallocation of resources leads to unemployment

Modern tribalism re-emerges



RENAISSANCE RELOADED



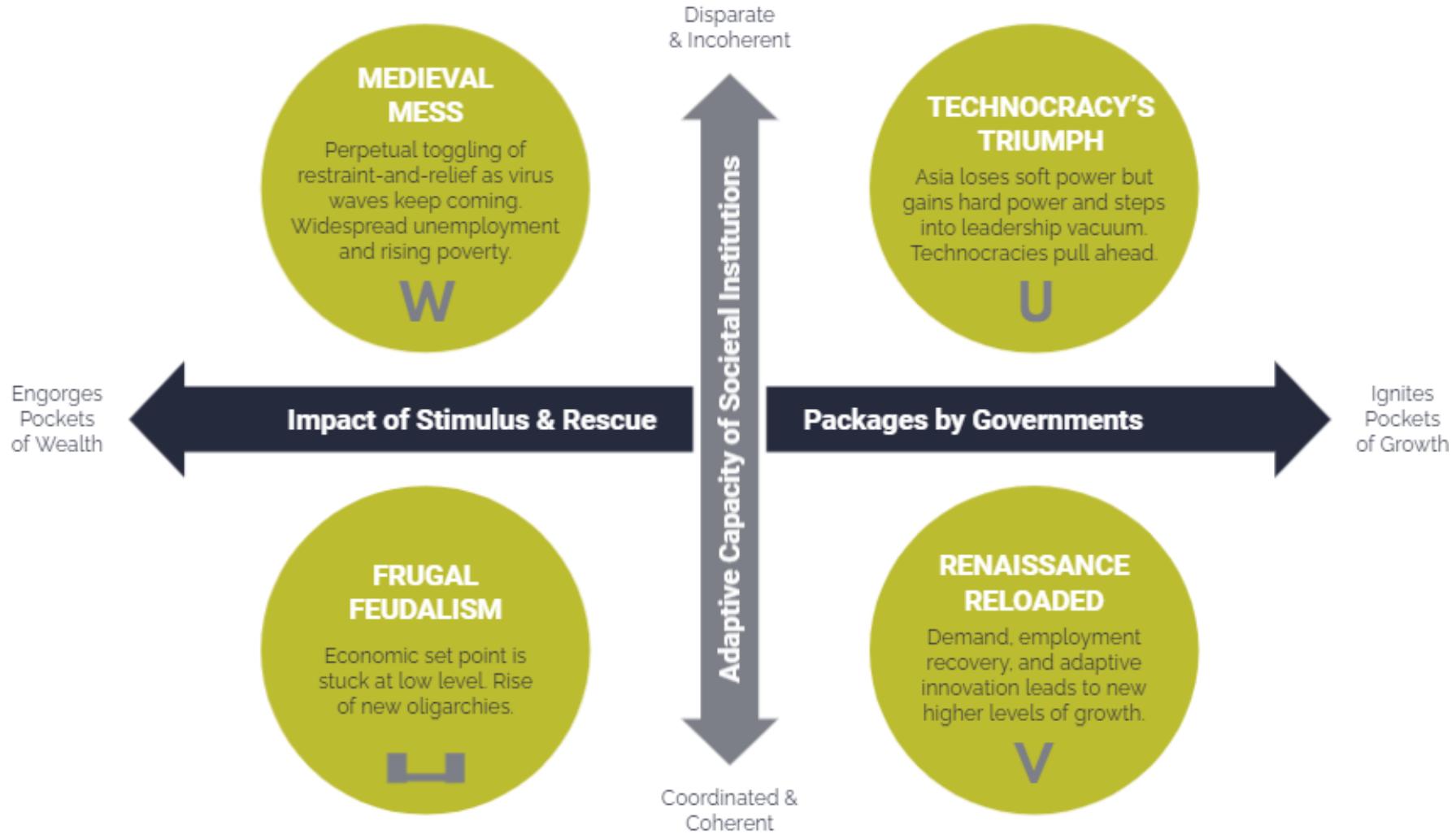
Adaptive innovation leads to new higher levels of growth

The world gains antifragility

Creativity and productivity increase

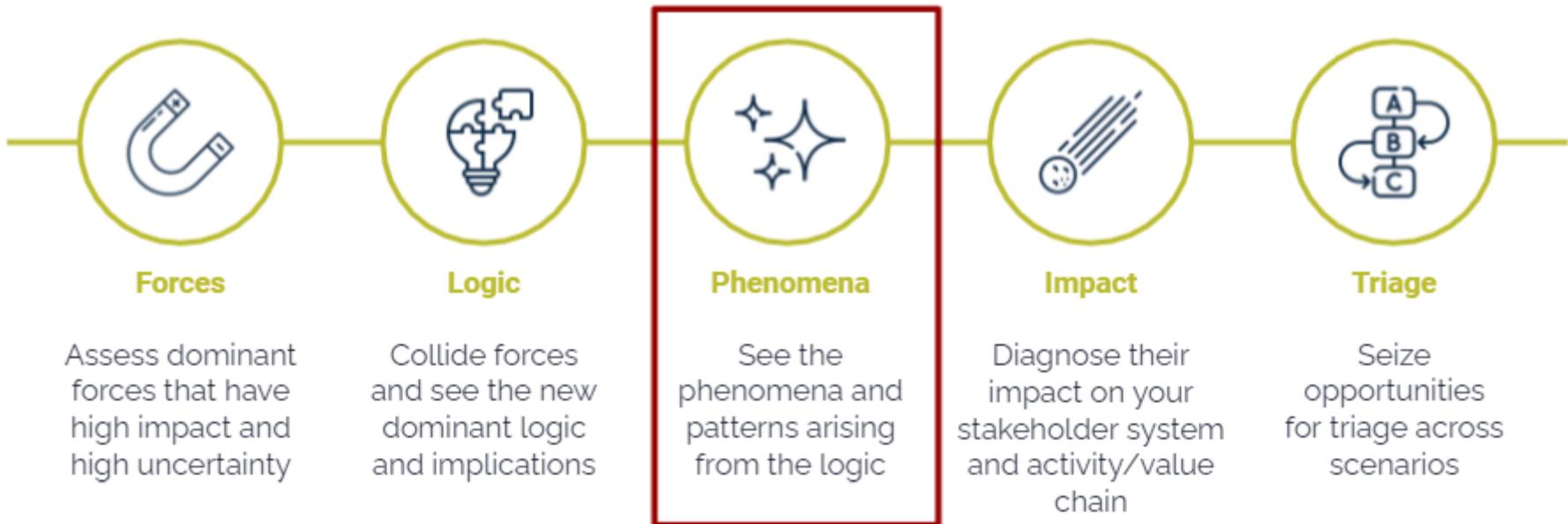
Techno-optimism surges

Future Logics



FLP IT Model

Five steps to resilience



Phenomena & Patterns

01 |

After Tremors



02 |

Unavoidable Rollups



03 |

Decentralized Supply Chains



04 |

Hybridized Work



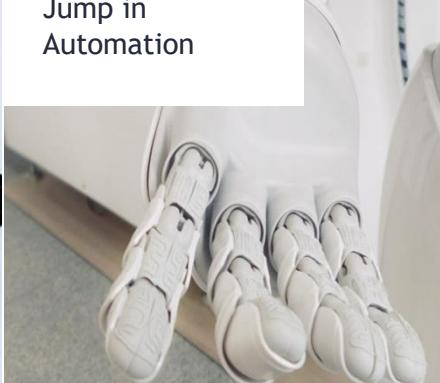
05 |

Real Time Data Push



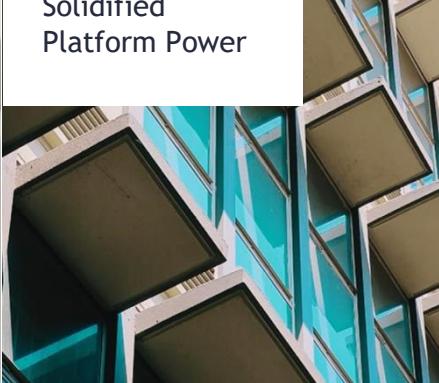
06 |

Jump in Automation



07 |

Solidified Platform Power



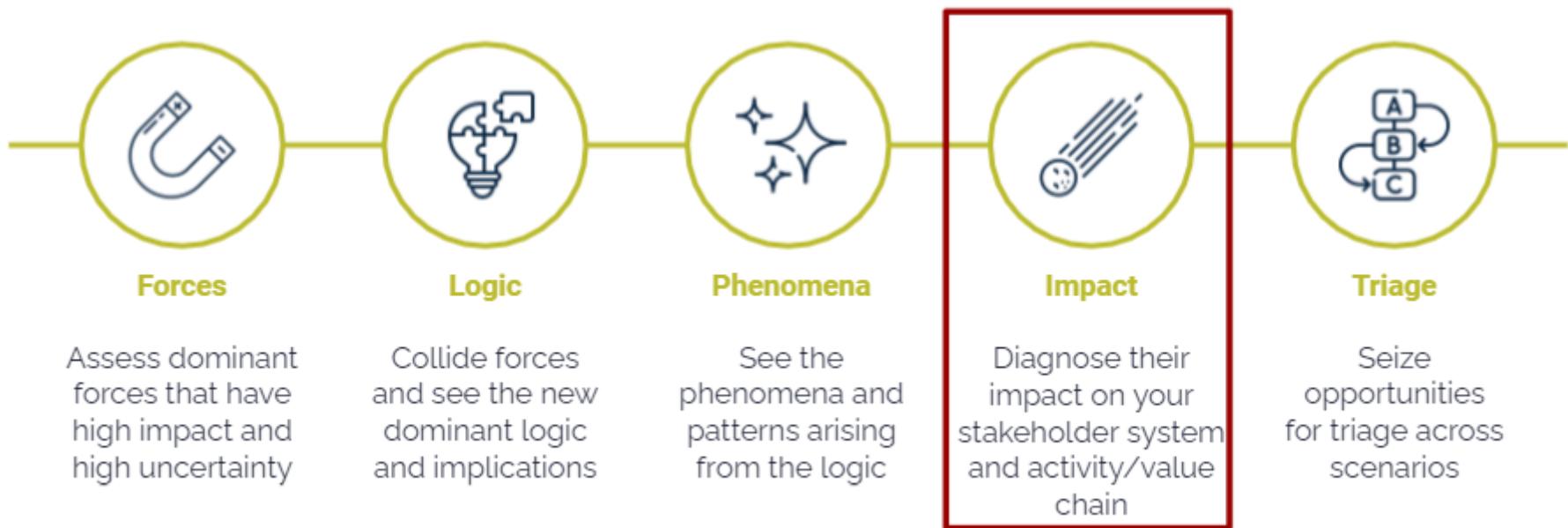
08 |

Localism vs. Virtualism



FLP IT Model

Five steps to resilience

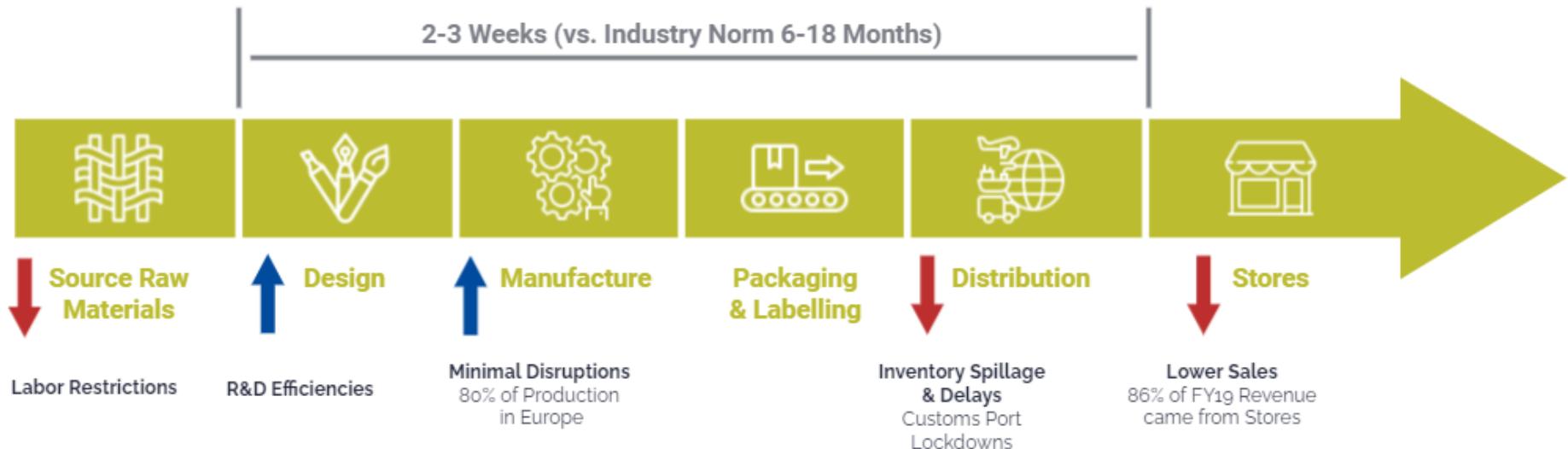




“If they are healthy, they will learn and heal. If they are flawed and fragile, they will break.”

Nassim Nicholas Taleb

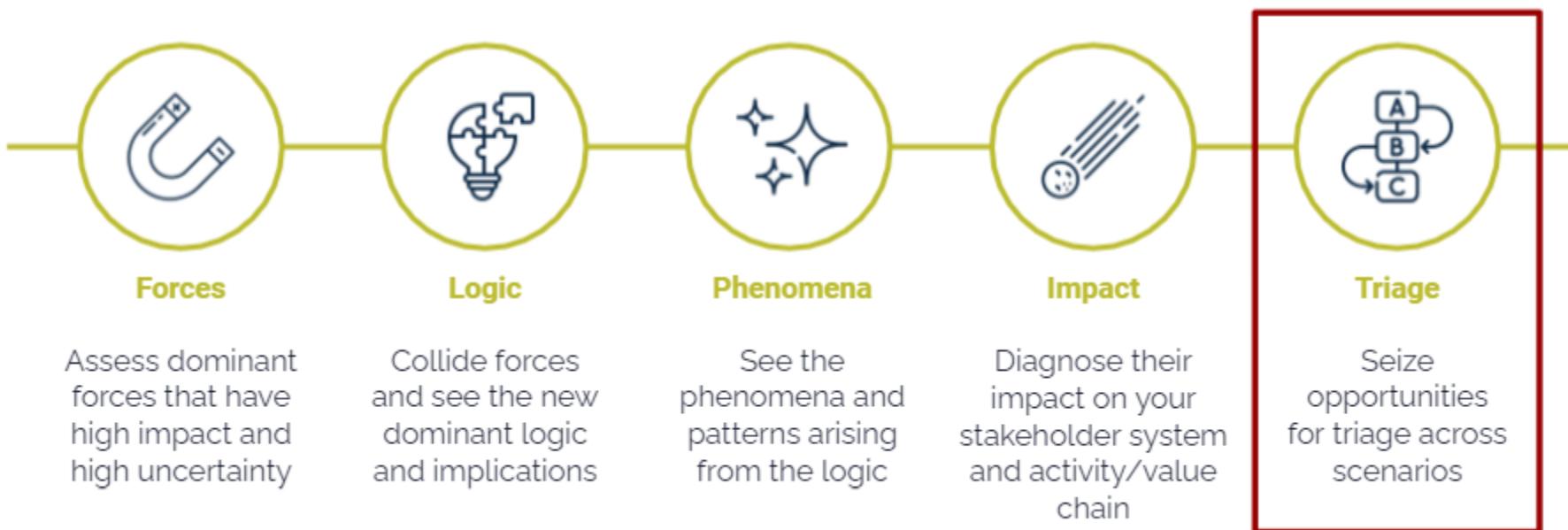
Fashion: An Example Value Chain



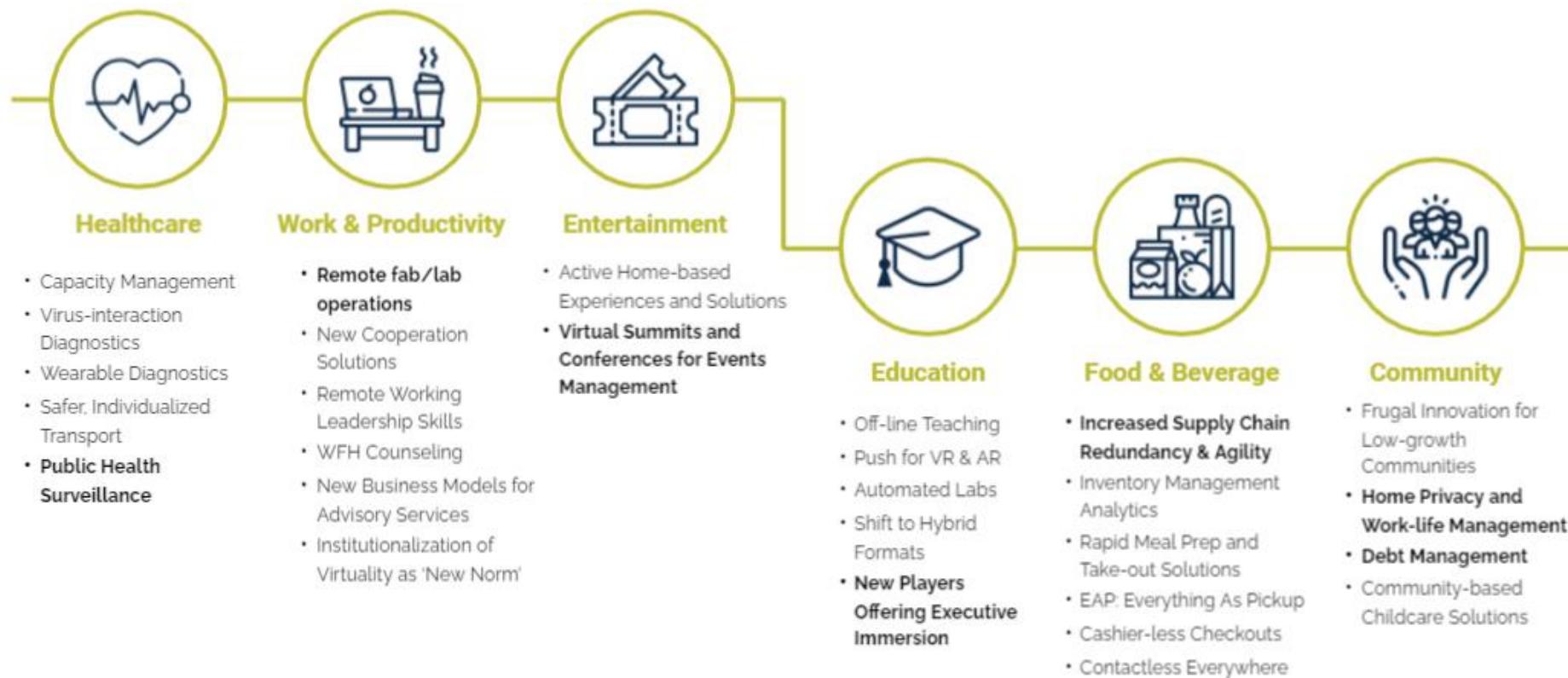
Who's vulnerable? Who can leverage downstream and upstream?

FLP IT Model

Five steps to resilience

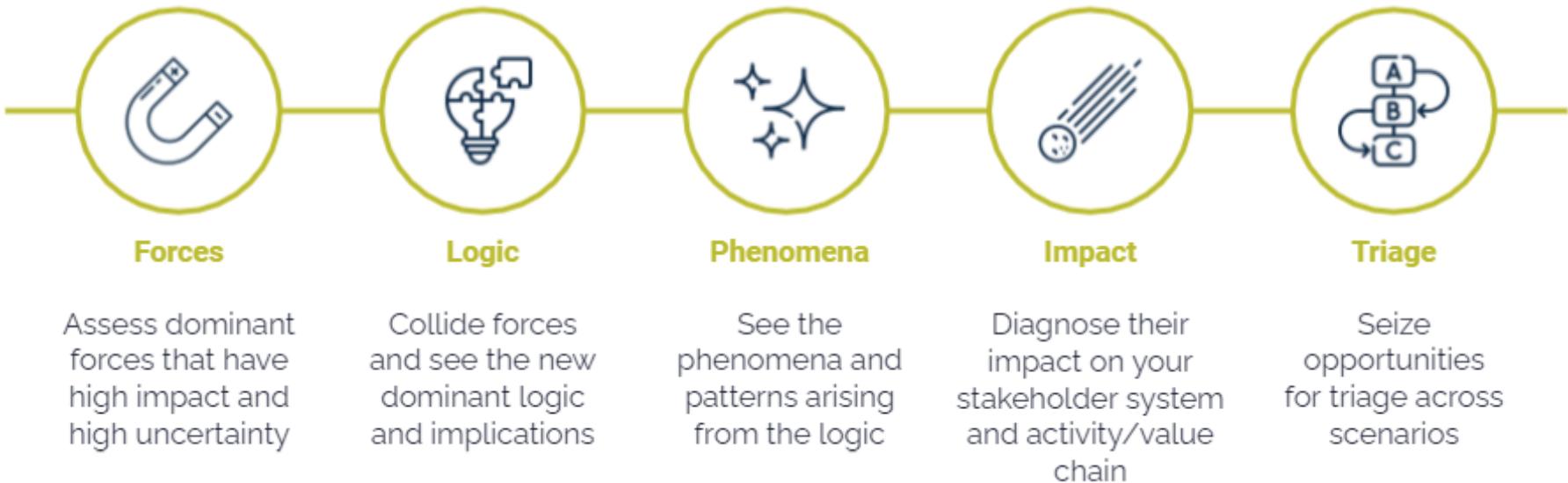


Triage



FLP IT Model

Five steps to resilience



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