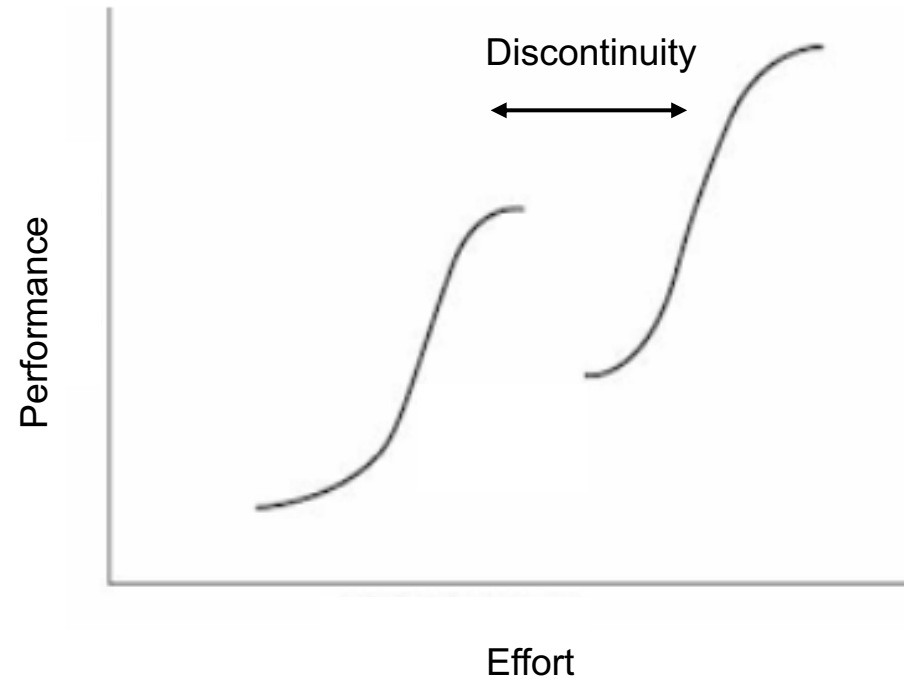


Leadership Challenges in Digital Transformation

Globelics Academy, Tampere 16.8.2019
Matti Sommarberg

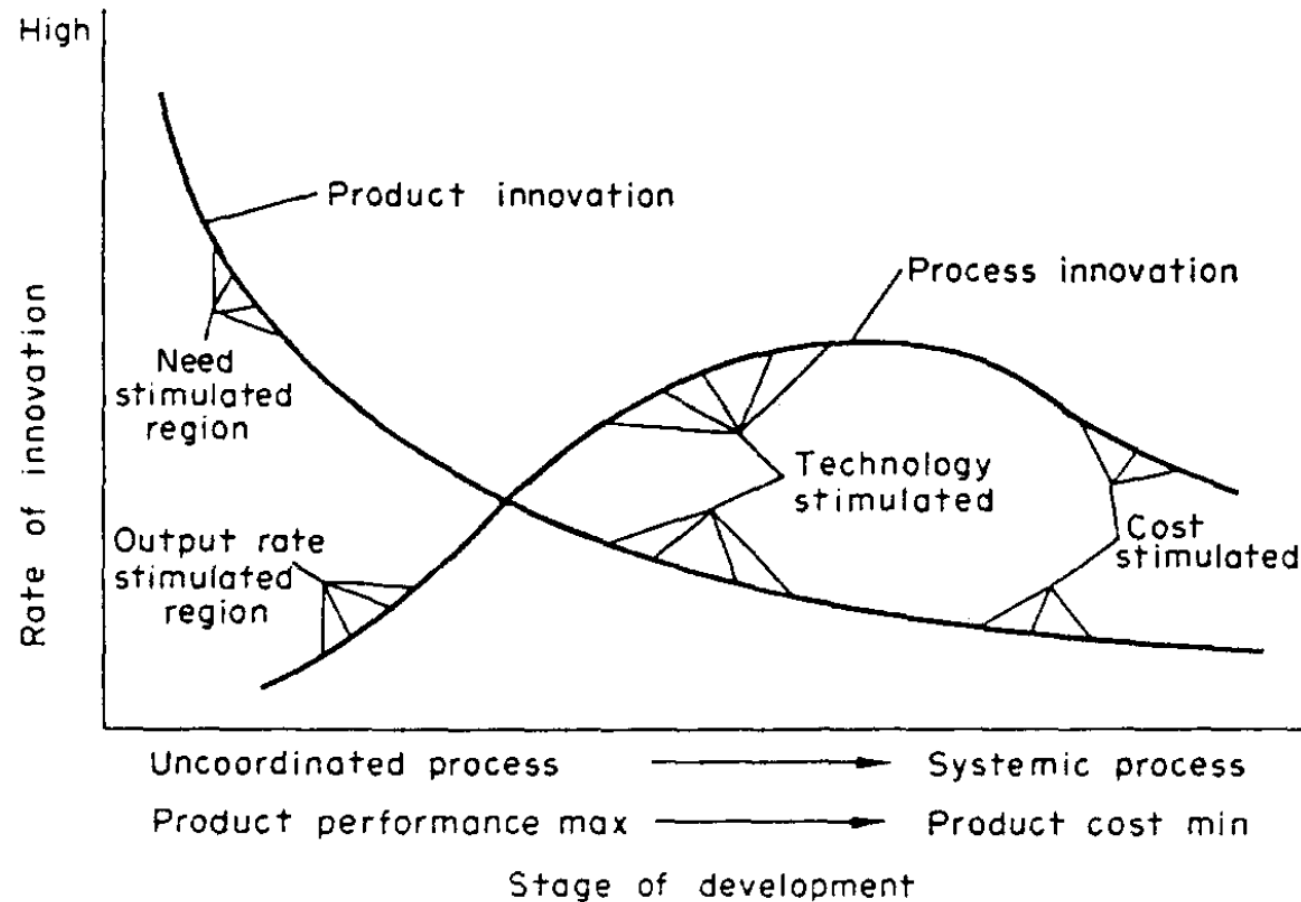
- Perspectives on discontinuities
- Role of the technology
- Empiric findings
- Conclusions

Evolution vs. revolution



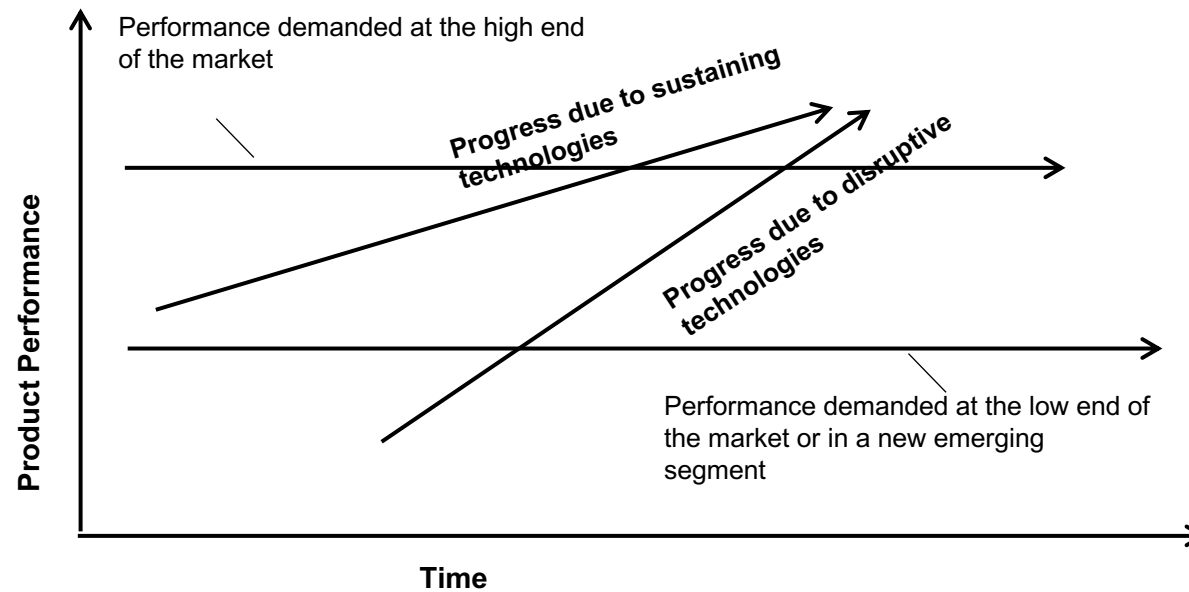
Foster, Richard N. (1986). *Innovation: The Attacker's Advantage*, Summit Books, New York, USA, p.102

Discontinuity is often the target of innovation



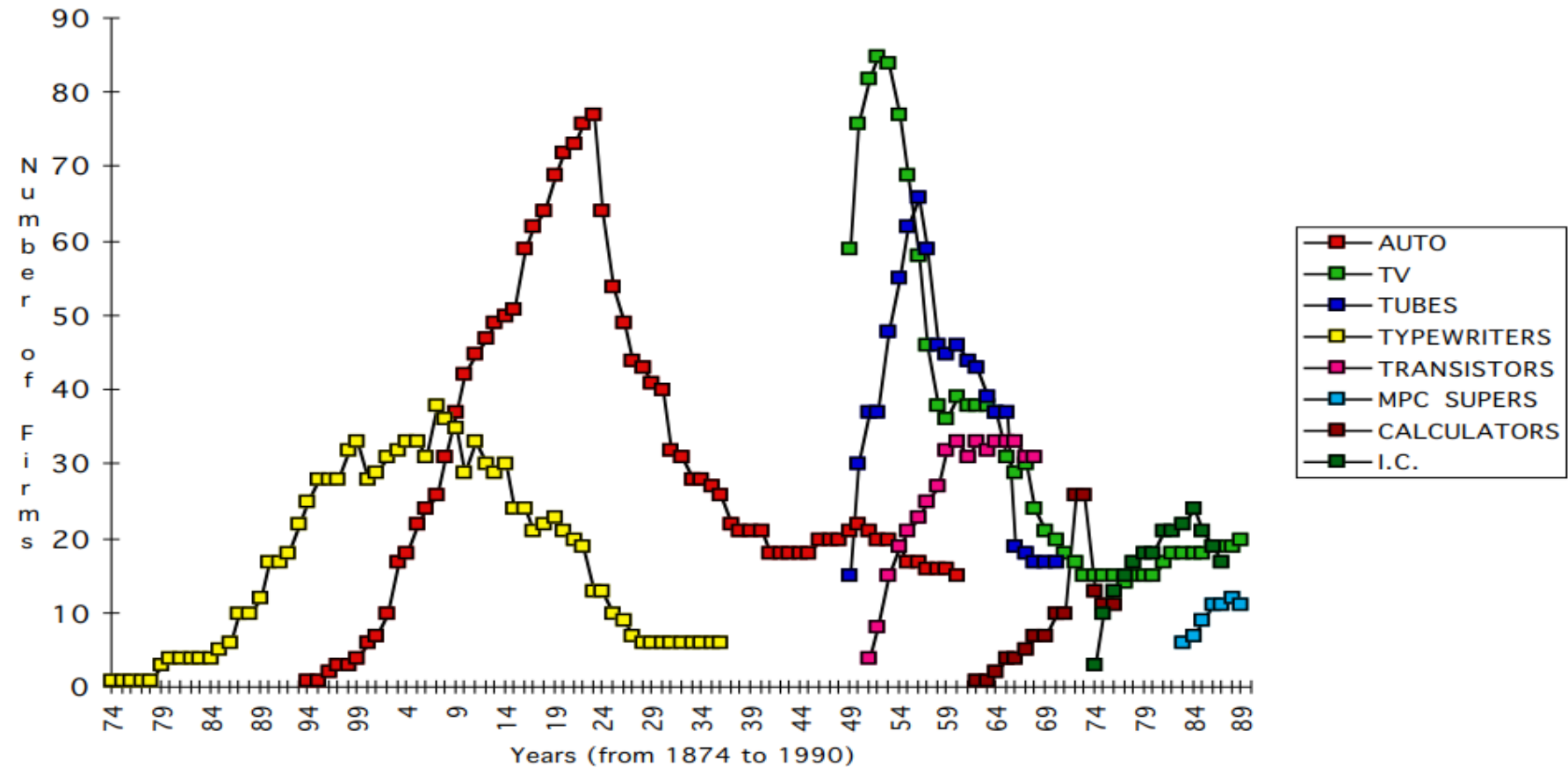
Utterback & Abernathy (1975). A Dynamic Model of Process and Product Innovation, Omega, Vol. 3, No.6, pp. 639-656

It can also disrupt existing businesses or industries



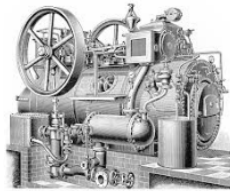
Christensen, Clayton M. (2011 4th ed.). The Innovators Dilemma, HarperCollins, New York, USA, pp. xix

Which is not a feature from digital era

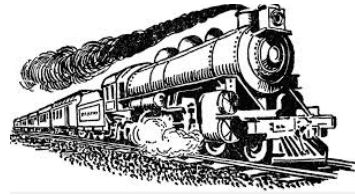


Utterback & Suarez (1993). Innovation, Competition and Industry Structure, Research Policy, Vol. 22, No.1, pp. 1-21

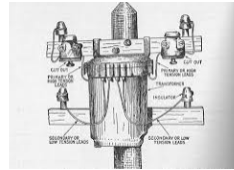
Some systemic innovation impact all industries



1780-1830



1830-1880



1880-1930



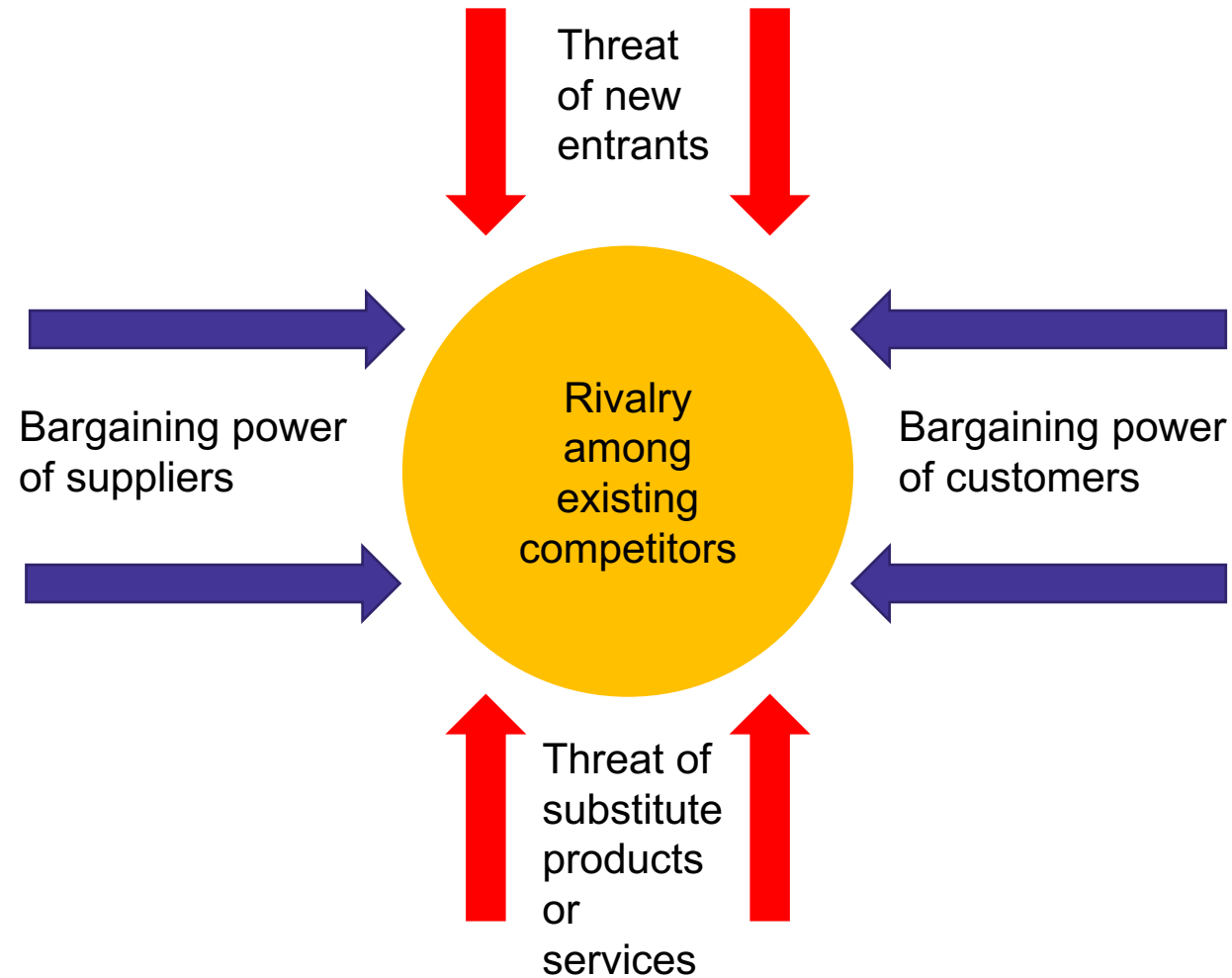
1930-1970



1970-2010

Nikolai Kondratiev 1892-
1938

Dynamics has traditionally been driven by the value chain,

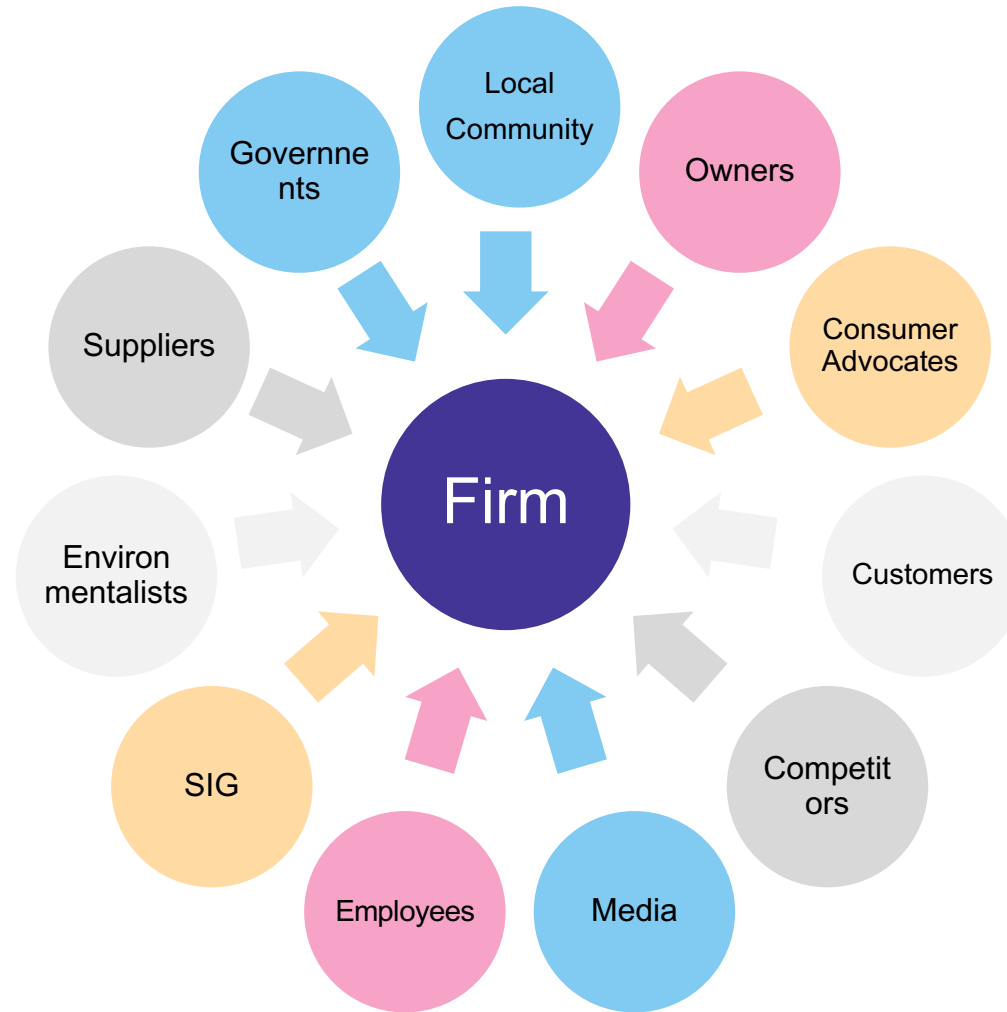


as well business environment at large



Modified from Aguilar, Francis Joseph (1967). Scanning the Business Environment, Collier-Macmillan, Toronto, Canada, pp. 1-17

or by the stakeholders.



Modified from Freeman, Edward, R. (2015). Strategic Management: A Stakeholder Approach, Cambridge University Press, Cambridge, UK, p. 25

Digital technologies drive industry convergence

Convergence: “the blurring of industry boundaries that creates competition among firms, which did not compete with another previously.”*

- ICT and media
- Functional food
- Consumer / industrial
- Service into products
- Software into everything



McKinsey Quarterly October 2017

* Prescott, J.E.; Karim S; Hsu S. (2014). The Strategic Process and Competitive Dynamics of Industry Convergence, Strategic Management Society, 34th Annual Conference, Madrid

and disruption cases are often out-of-industry (and they also shadow the actual phenomena)

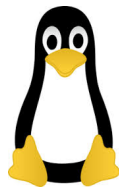
Share economy



Platform



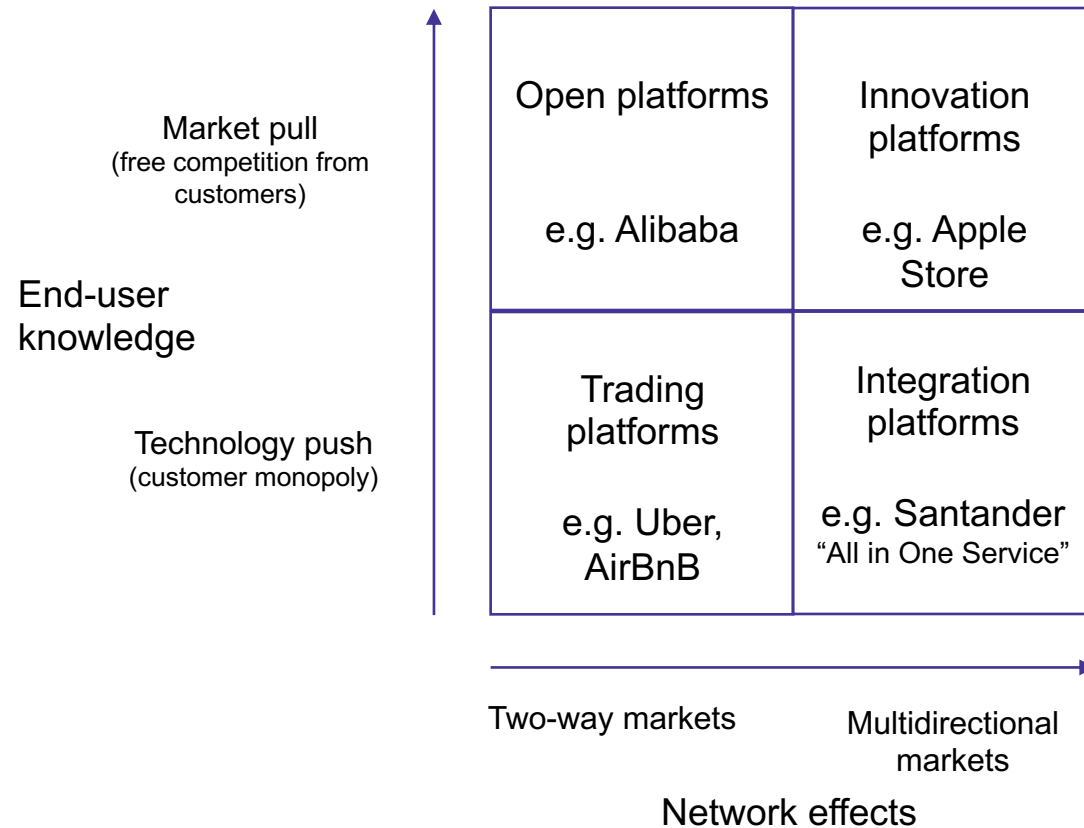
Open Innovation



Blockchain



Platforms are not explained by the value chain



Impact of digital technologies is difficult to detect as

Most digital technologies are generic

- Multiple applications
- Across industries

Technologies are systemic and interrelated

Magnitude is also in our head

Availability Heuristics

Kahneman, Daniel (2003). Maps of Bounded Rationality: Psychology of Behavioral Economics, American Economic Review, Vol. 93, Issue 5, pp. 1449-1475

Bounded Rationality

Simon, Herbert A. (1979). Rational Decision Making in Business Organizations, American Economic Review, Vol. 69, Issue 4, pp. 493-513

Status Quo Bias

Daniel Kahneman; Jack, L. Knetsch; Richard H. Thaler (1991). Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias, The Journal of Economic Perspectives, Vol. 5, Issue 1, pp. 193-206

Halo Effect

Rosenzweig, Phil (2007). The Halo Effect, Free Press, New York,



Industry Recipe

Spender J.-C. (1989), Industry Recipes, An Enquiry into Nature and Sources of Managerial Judgement, <http://jcspender.com/uploads>

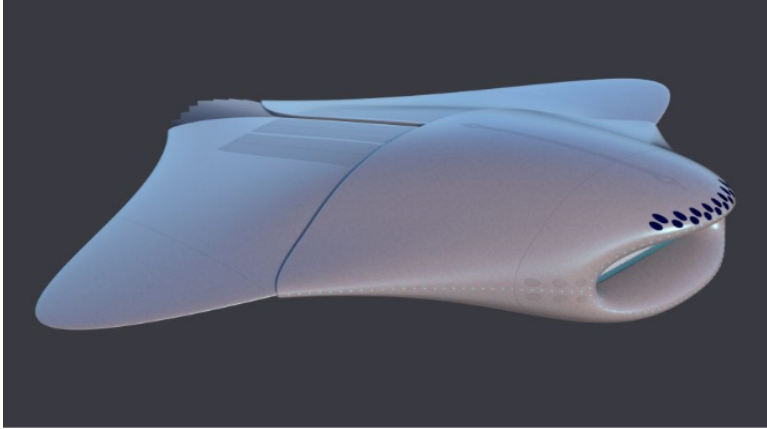
Absorptive Capacity

Cohen, Wesley M.; Levinthal, Daniel A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation, Administrative Science Quarterly, Vol. 35, Issue 1, pp. 128-152

Dominant Logic

Prahalad, C.K.; Bettis, Richard A. (1986). The Dominant Logic: a New Linkage Between Diversity and Performance, Strategic Management Journal, Vol. 7, Issue 6, pp. 485-501

AM / 3D printing



<https://3dprinting.com/news/royal-navy-reveals-nautilus-100-3d-printed-submarine-concept/>

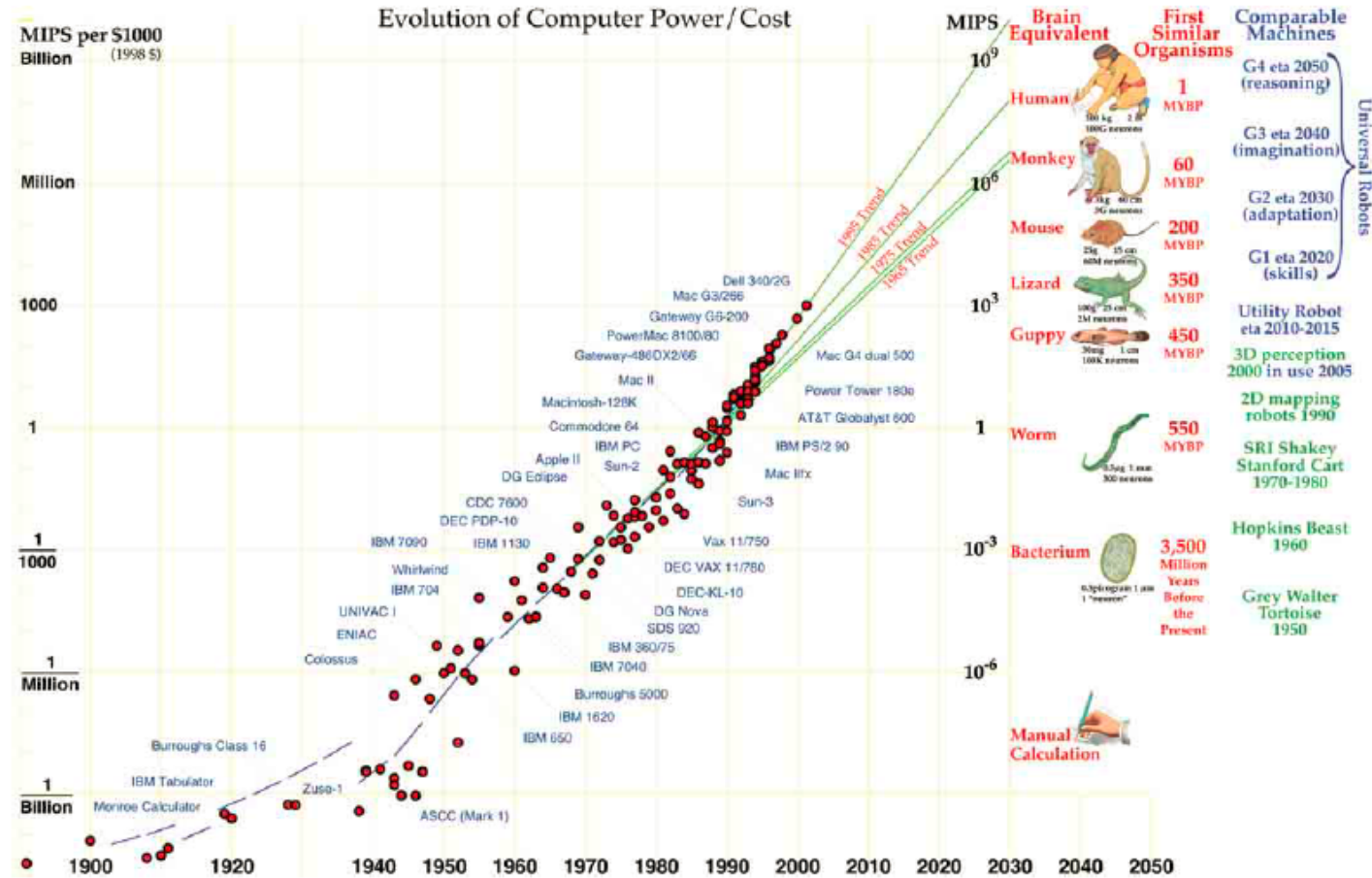


<https://www.worldmaritimenews.com>

- Decoupling physical value chain
- New Features
- Hybrid opportunities

- Material coverage ?
- Cost development ?
- New business models ?

Big Data / Artificial Intelligence



Moore

Hans Morawec (2003), Robots, after all, Communications for ACM, Vol. 46, Issue 10, pp. 90-97

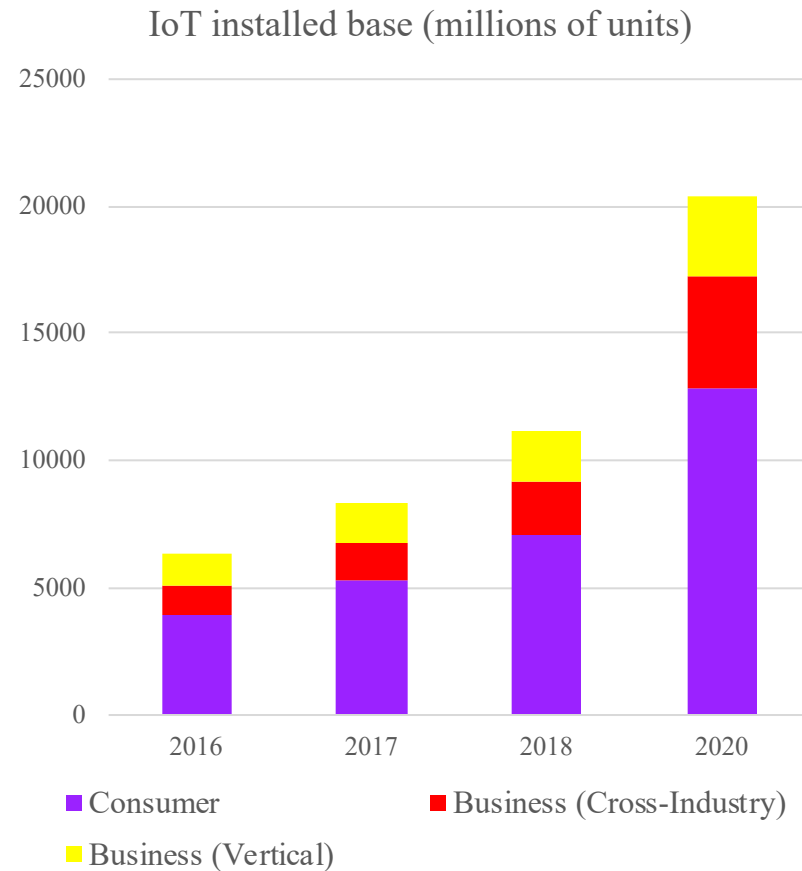
Cloud Computing



- Cost?
- Capacity?
- Security?
- New business models?

- New normal already?

Internet of Things



- The development is inevitable
- 5G?
- Architecture?
- Security?
- New business models?

8.4 Billion Connected "Things" Will Be in Use in 2017, Up 31 Percent From 2016, Gartner press release from February 7, 2017

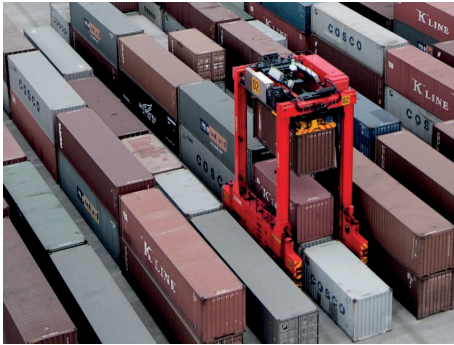
Model Based System Engineering



- Modelling capabilities
- Multidisciplinary
- Life time
- Advanced design tools
- Interfaces like AR, VR
- Digital twin concept
- Enabling co-creation

<https://community.plm.automation.siemens.com/t5/Digital-Transformations/The-value-of-the-digital-twin/ba-p/385812?lightbox-message-images-385812=31800iB94D19235331E799>

Robotics and/or autonomic systems



www.kalmarglobal.com



<https://waymo.com/>



<https://sanbot.com>



<https://www.rolls-royce.com/products-and-services/marine/ship-intelligence.aspx>



<http://www.tut.fi/fi/tietoa-yliopistosta/uutiset-ja-tapahtumat/robottibussit-liikenteeseen-hervannassa-x171216c3>

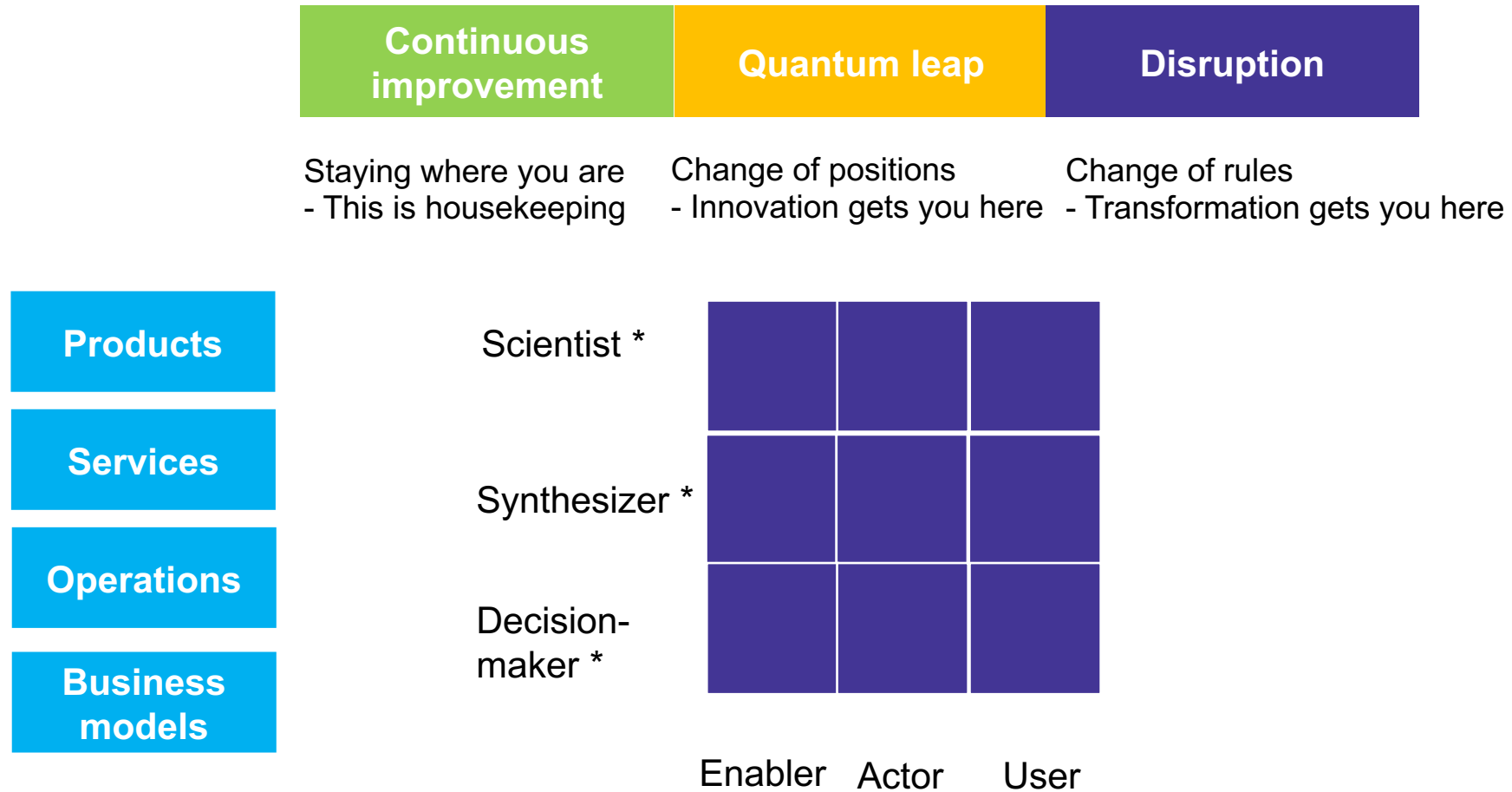


<https://www.amazon.com>

What factors, enabled by digitalization, drive disruption in machine building industry serving the global container handling?

Does the view differ based on position in the value chain?

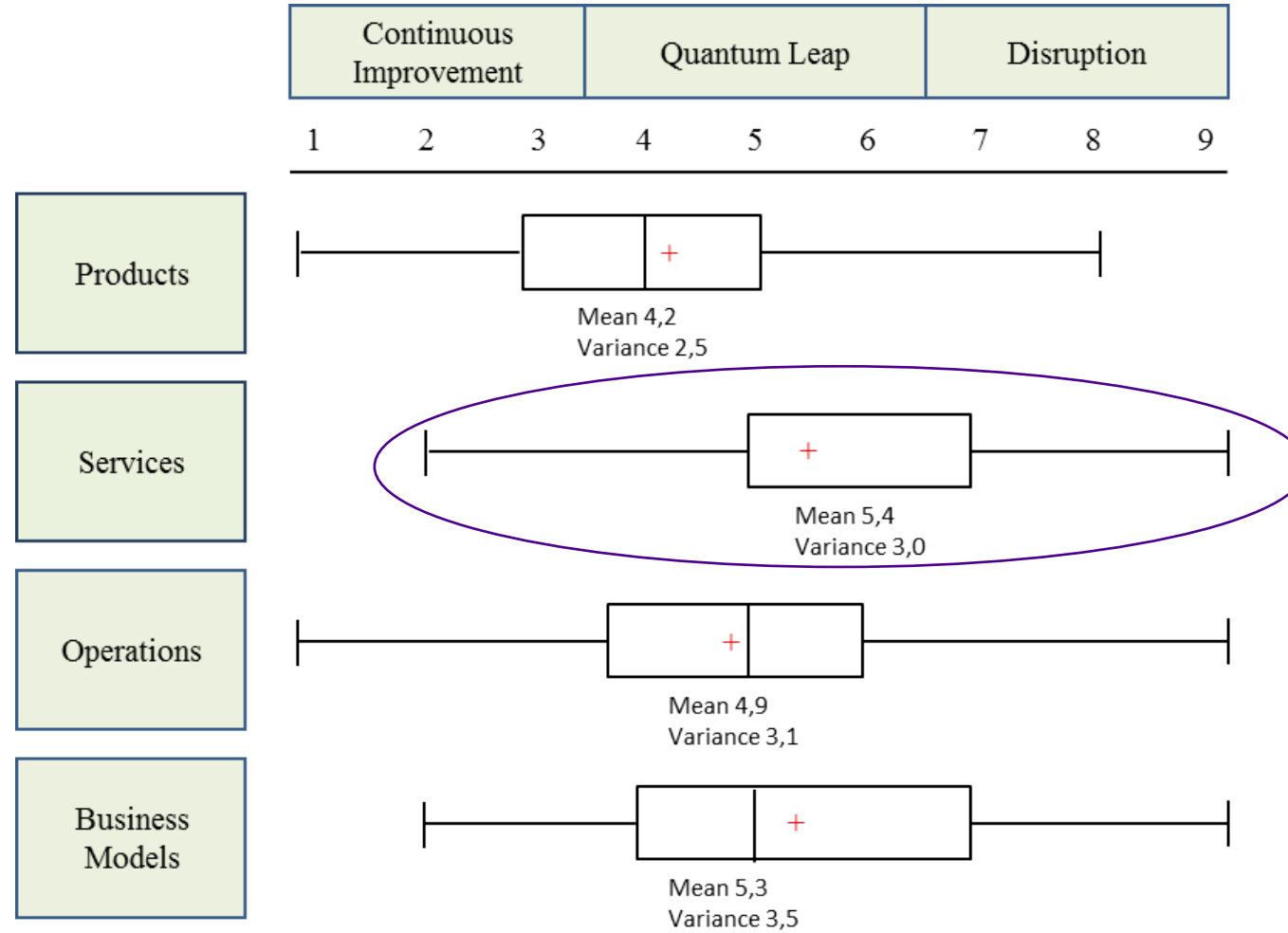
Nature of the potential impact



* Kuusi, Osmo (1999). Expertise In the Future Use of Generic Technologies, Epistemic and Methodological Considerations Concerning Delphi Studies, VATT-Research reports 59, Helsinki, pp. 36

- 246 research articles, books or reports
- 305 survey answers from 23 countries
- 60 interviews in 11 countries
- 3 industry cases
- Current business and ongoing experiments

Digitalization impact



Survey

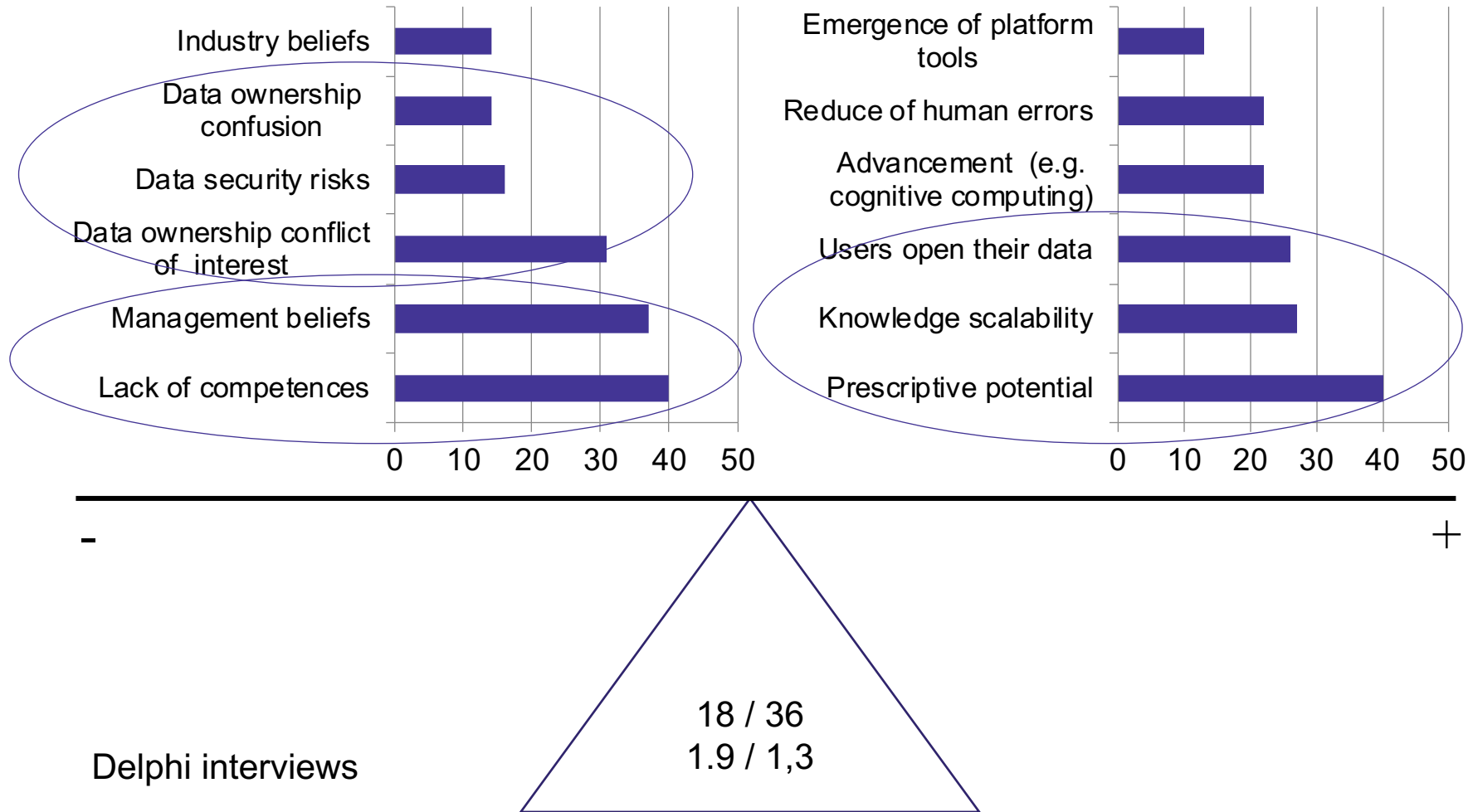
Drivers

Technology	# 1 / 36	Mean
→ Big Data / AI	18	1.9
Internet of Things	9	2.4
Model Based System Engineering	5	3.9
Robotization	2	3.7
AM / 3D	2	5.2
Cloud computing	0	4.9

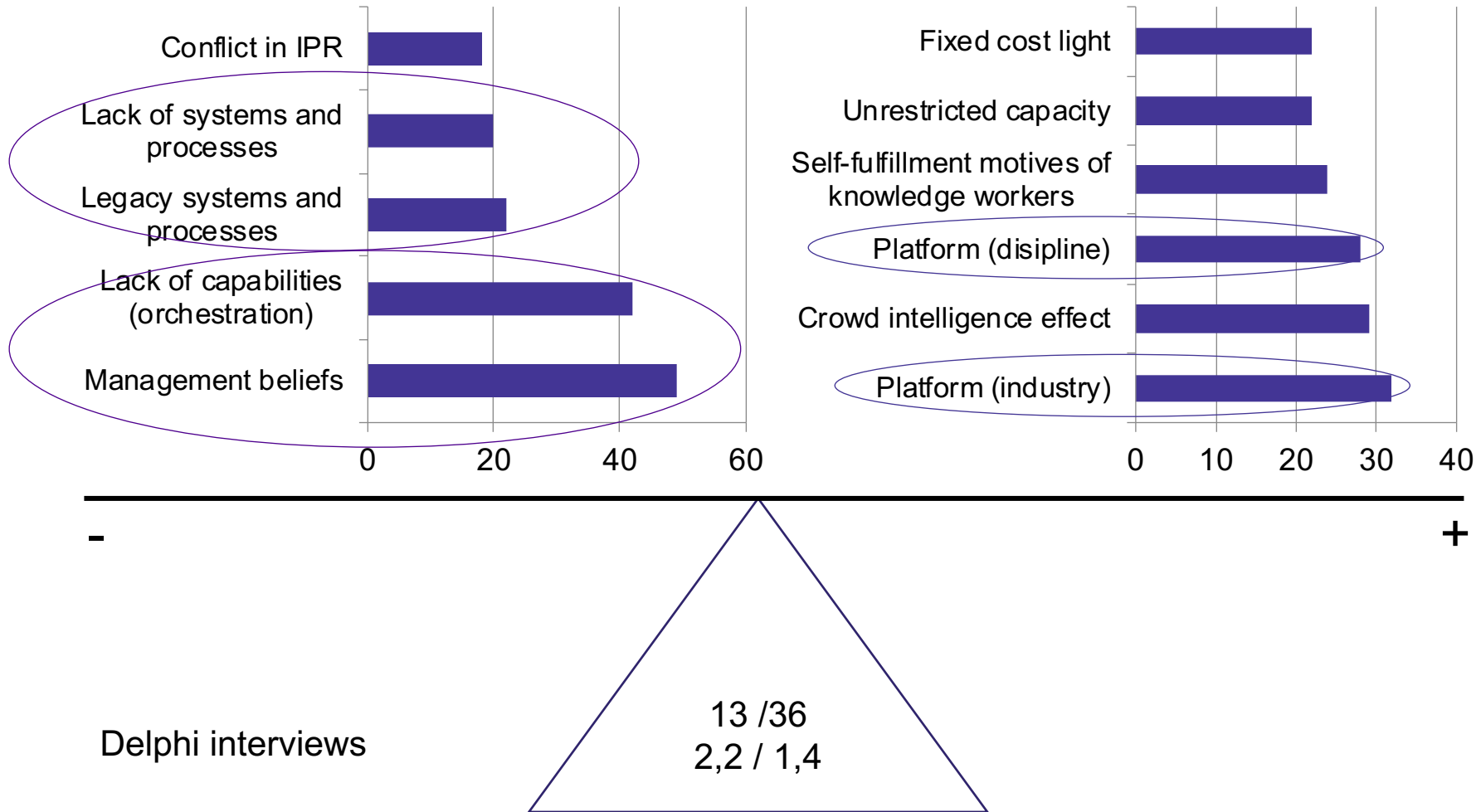
Economic		Mean
Networks, crowds, platforms	13	2.2 ←
Industry convergence	9	3.8
Radical innovation	7	3.8
Digital business models	4	2.7
Firm, strategy and management	2	4.1
Industry forces (six)	1	5.2
Risk capital	0	6.4

Delphi interviews

Big data, Artificial intelligence

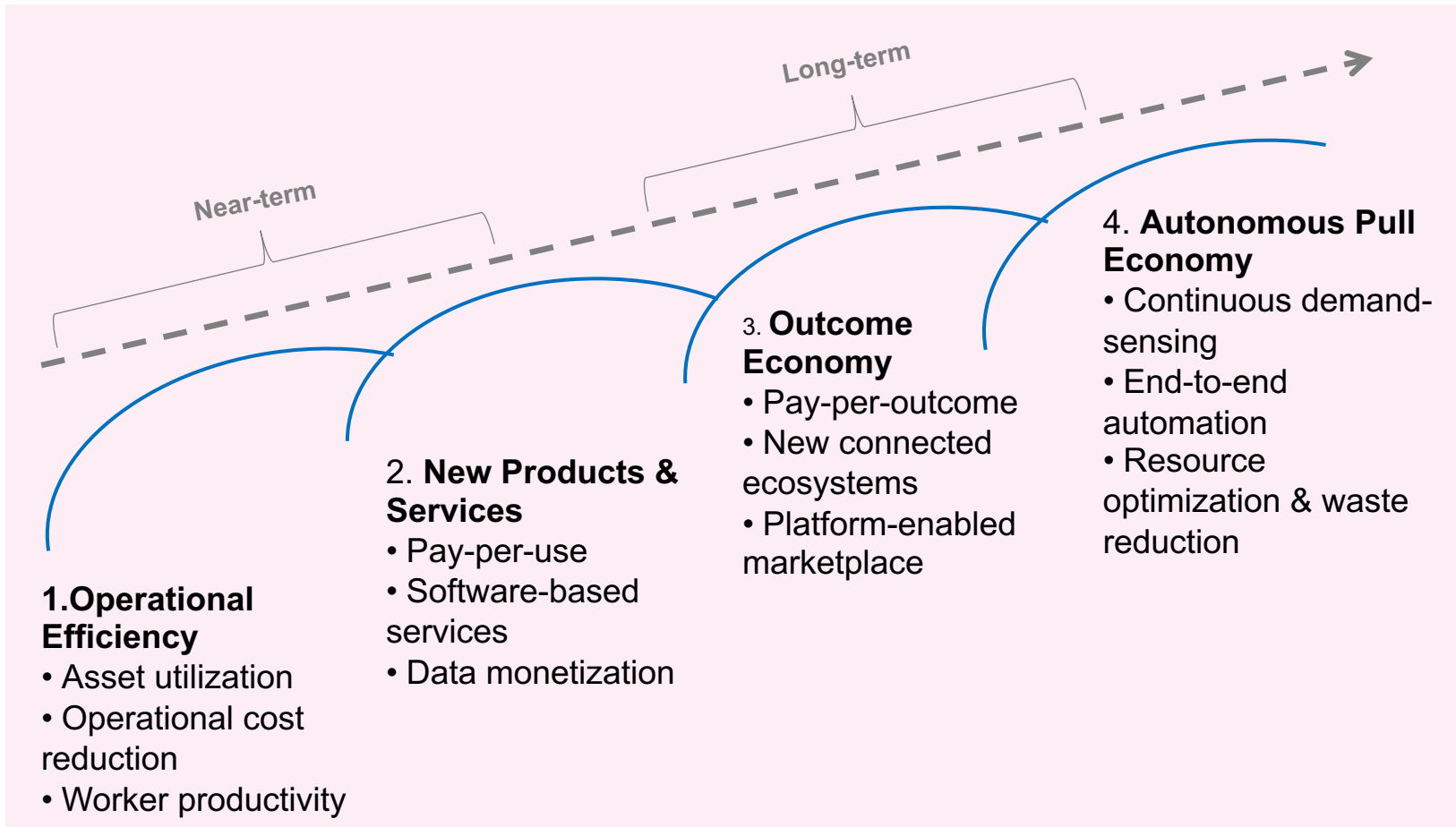


Networks, crowds, platforms



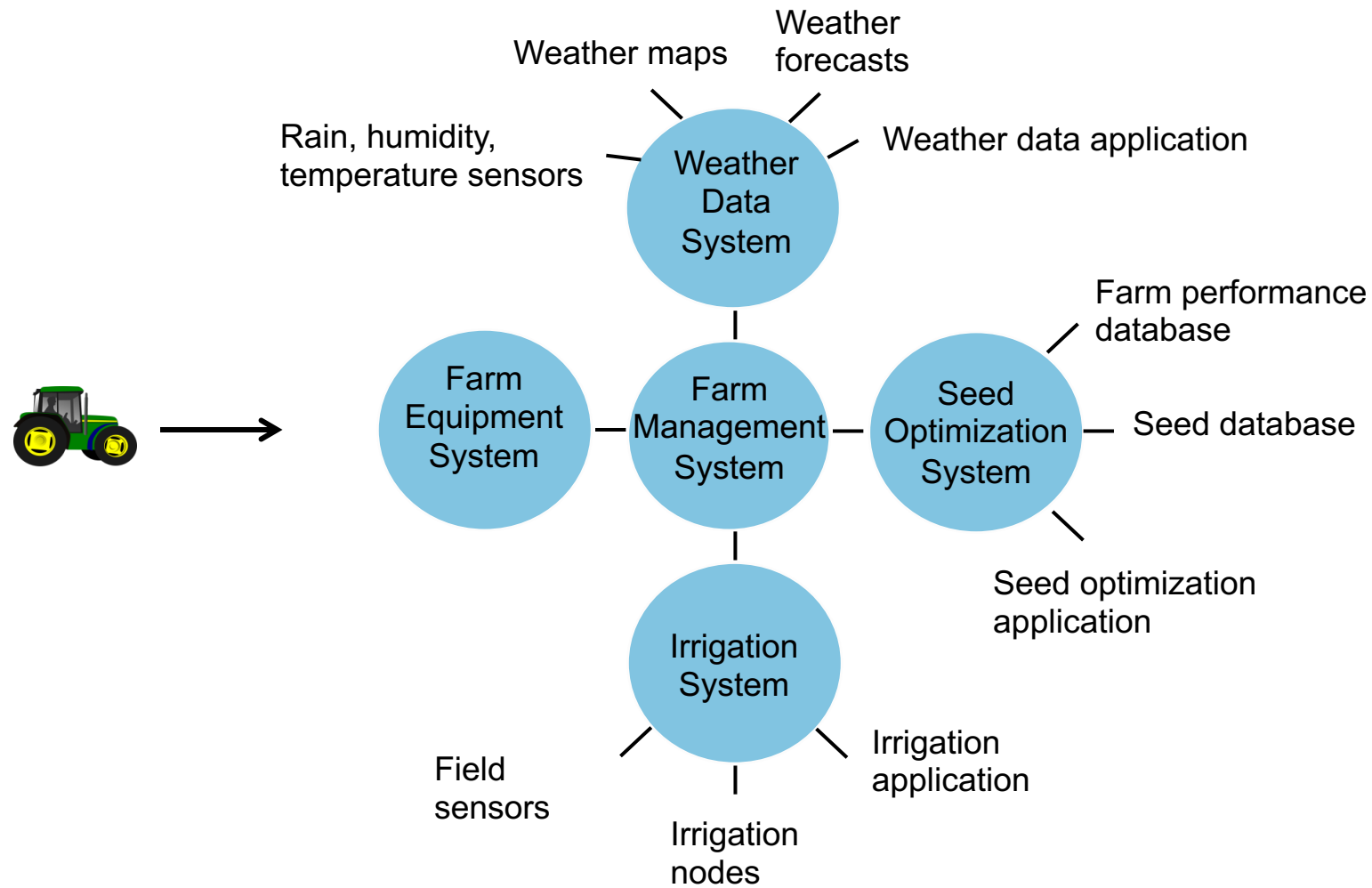
Conclusions

This appears still to make sense



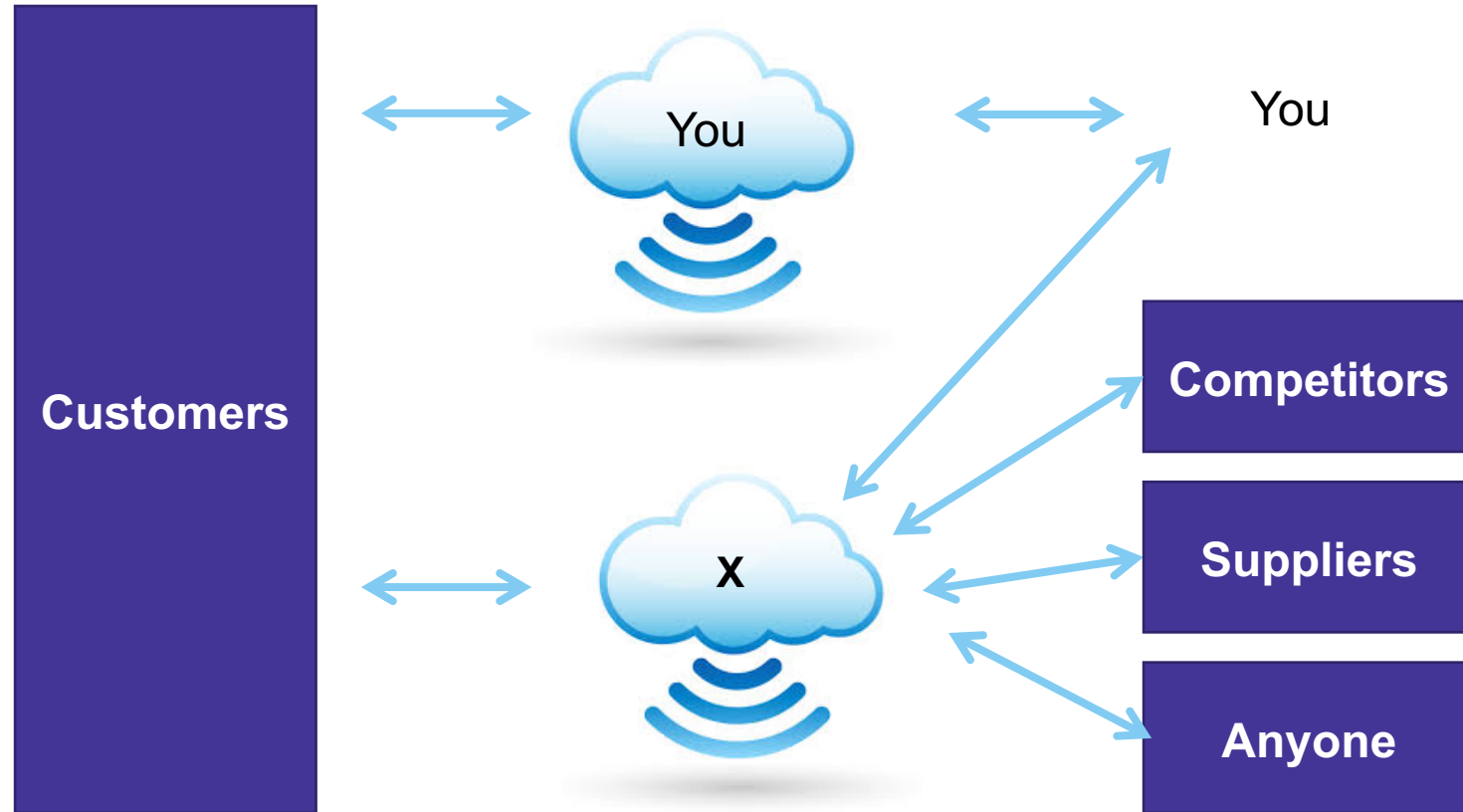
World Economic Forum (2015). Industrial Internet of Things: Unleashing the Potential of Connected Products and Services

This already exists

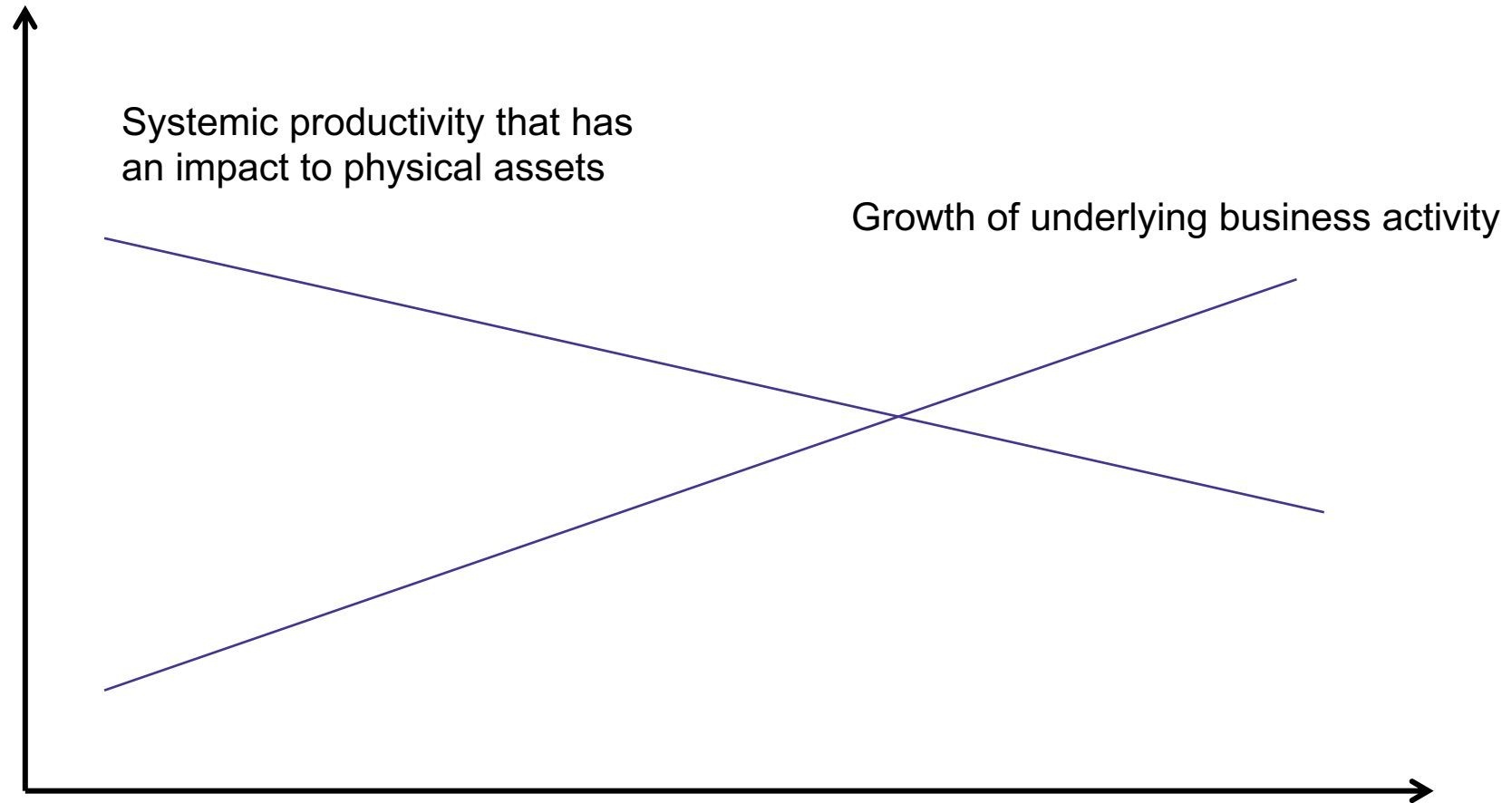


Porter, Michael E.; Heppelman, James, E. (2014). How Smart, Connected Products Are Transforming Competition, Harvard Business Review, Vol. 92, Issue 11, pp. 64-88

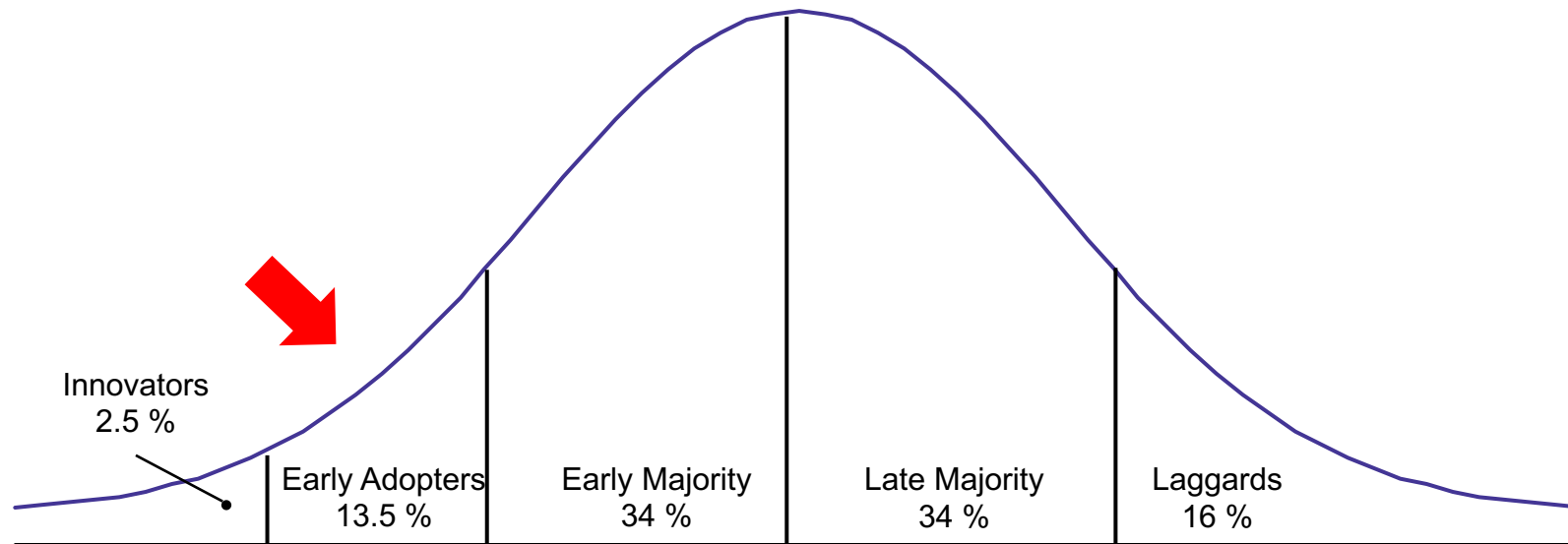
Platforms come – like it or not



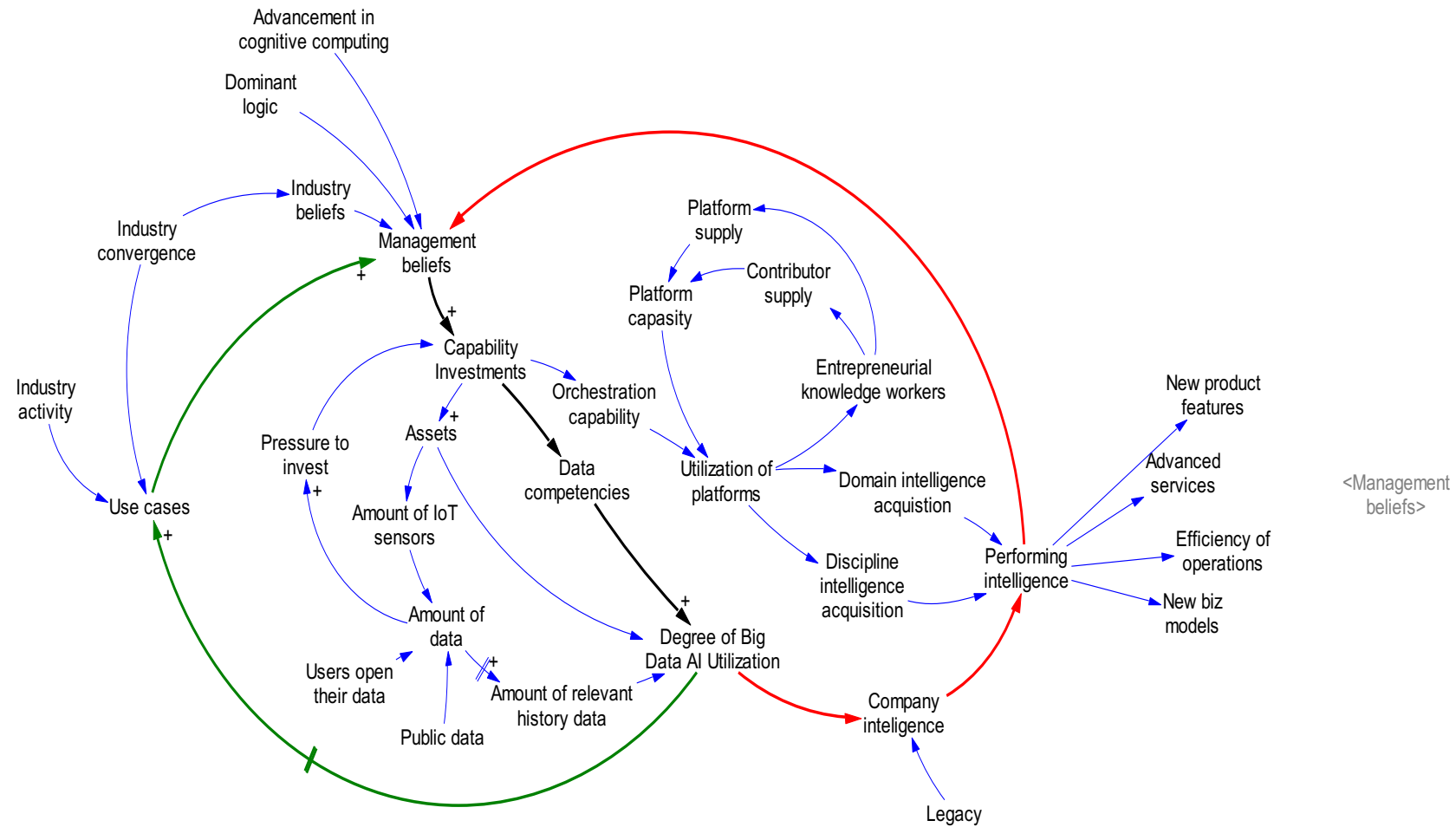
Is hardware growth sustainable?



Diffusion of innovation still likely to matter

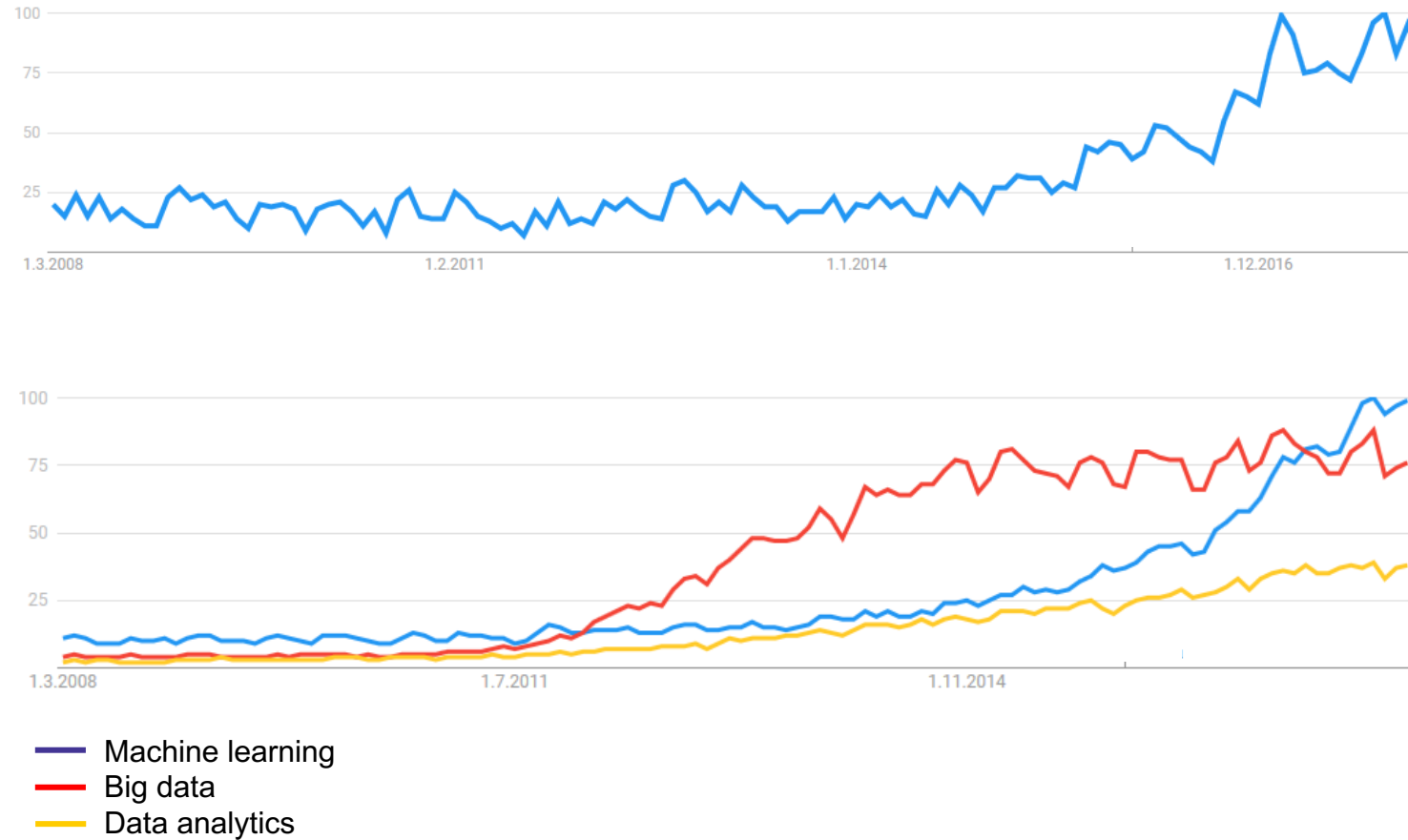


Rogers, Everett M. (2003, 5th ed.) The Diffusion of Innovation, Free Press, New York, USA, p. 281

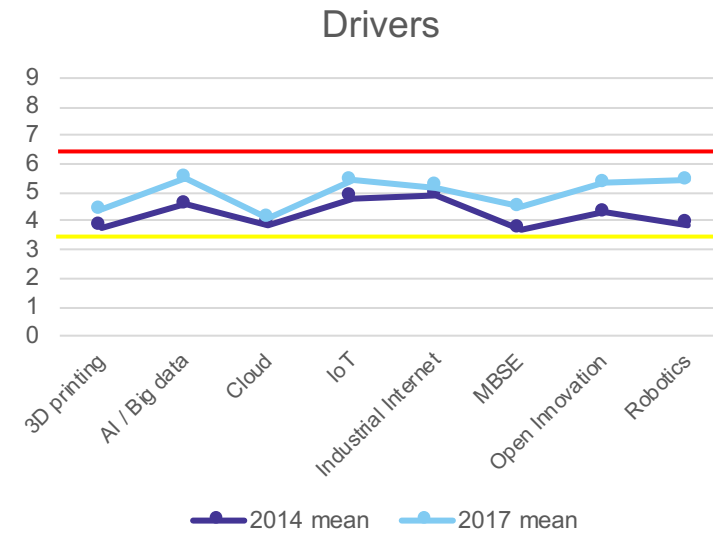
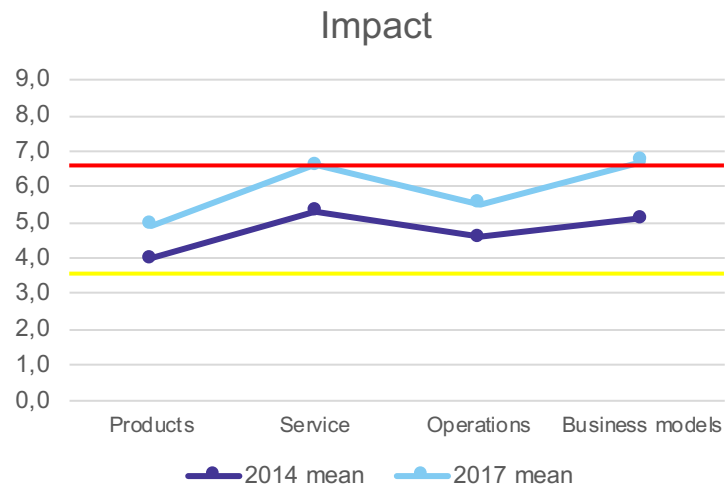


Public opinion (=Google trend)

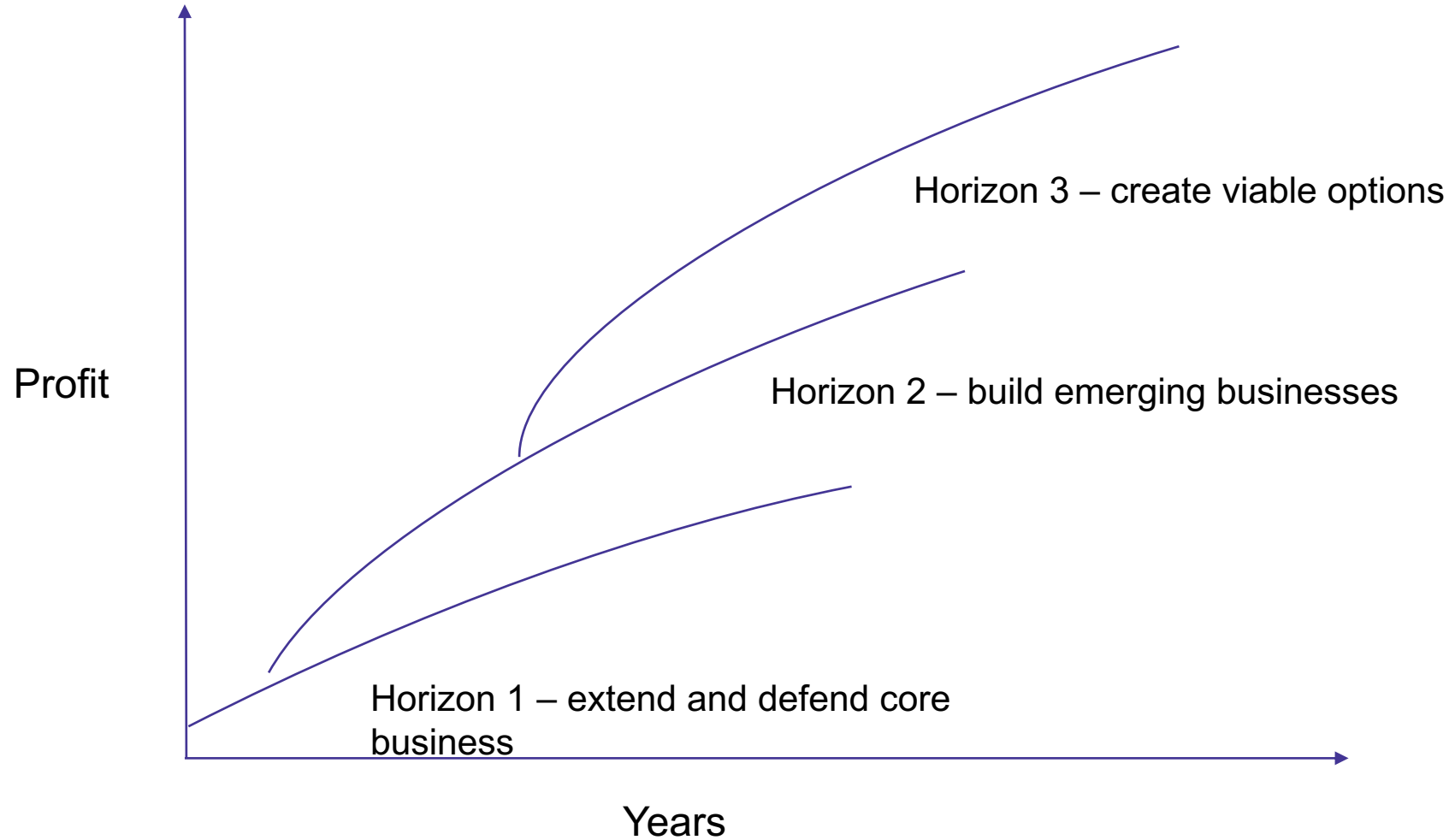
Digitalization



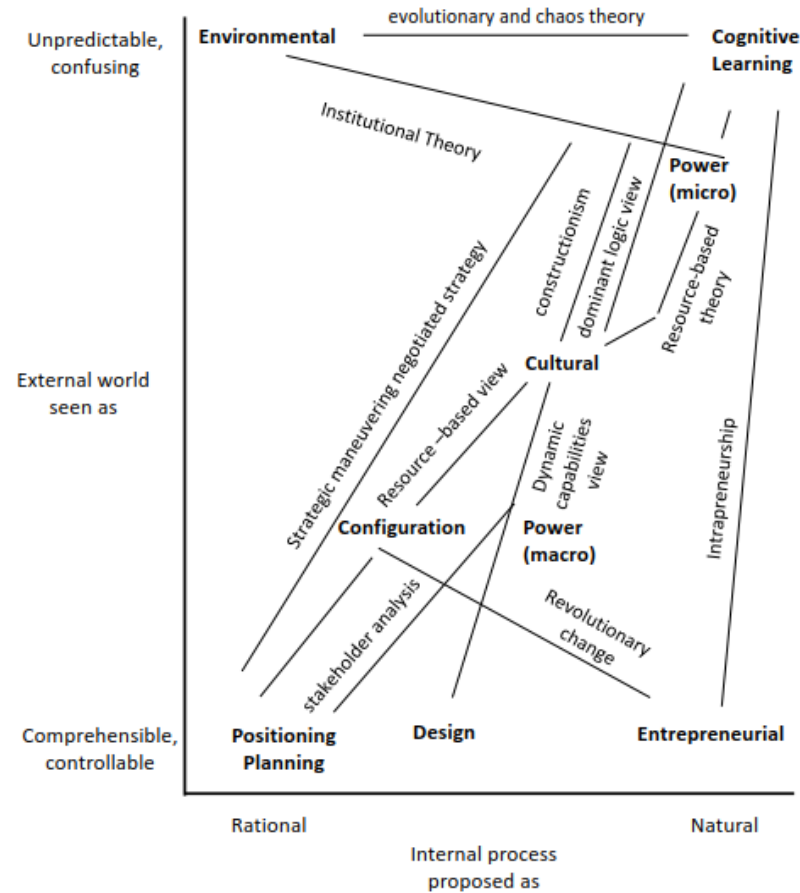
Finnish experts and temporality



Three strategic horizons



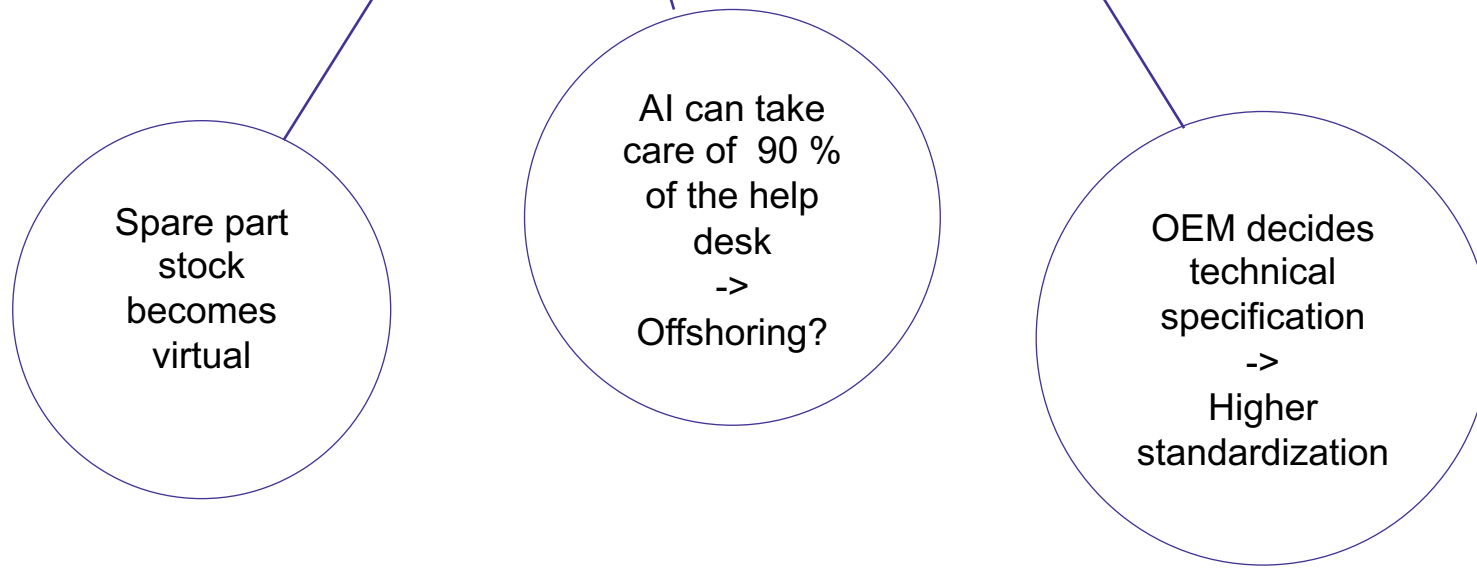
Temporality / Learning



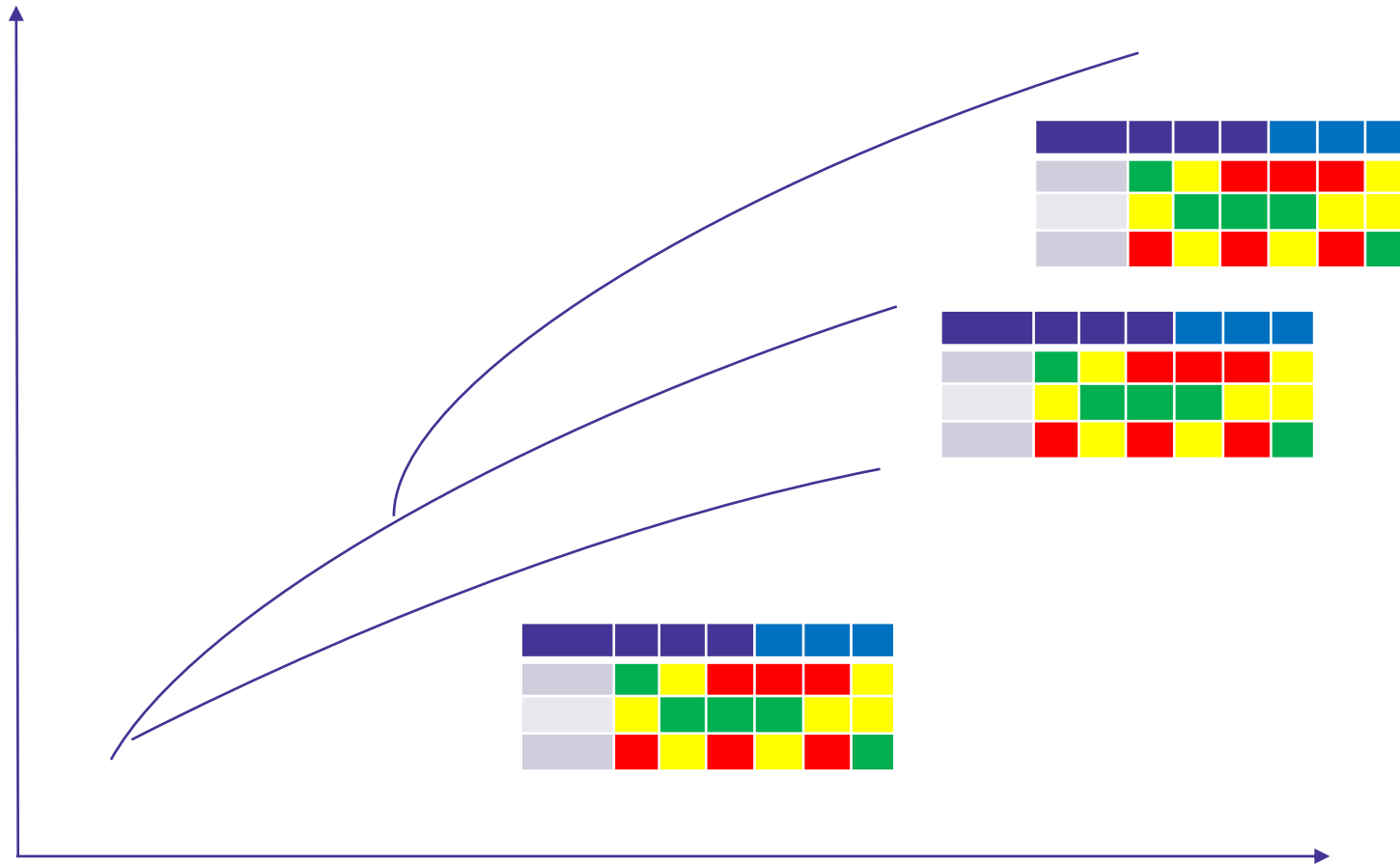
Minzberg, Henry; Ahlstrand, Bruce; Lampel, Joseph (1998).
Strategic Safari, The Free Press, New York, USA, p. 369

Critical capabilities mapped, example

	AM	AI	IoT	PE	OE	OI
Products						
Services						
Operations						



Are capability needs related to strategic ambition level (firm, industry, generic)?



Conclusions

- Business becomes data and user centric
- Platforms decouple old value chains that transforms into networks
- Speed of disruption is not slowed down by technology
- Service of everything, outcome economy, systems of systems disrupt current business models
- View of impact is a strategic choice (strong polarization)
- Leadership is vital (if transformation needed)
- Capabilities and understanding -> Experiments -> Learning
- Fundaments do not disappear (real world is still going be analogical, domain knowledge)
- Co-Creation, between disciplines, systemic eco-systems, experiments -> long term PPP (including users when possible)

“Those who cannot change their
minds cannot change anything”

- George Bernard Shaw