UNIVERSITY *of* NICOSIA

Department of Digital Innovation

MSc in Blockchain and Digital Currency

BLOC 526 – Emerging topics in fintech

Session 4 - Fintech applications in banking and insurance

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Learning objectives and expected learning outcomes

Summary

Session 4 builds up on the understanding of the fundamental banking and insurance business models to discuss the application of fintech in both industries, as well as its disruptive potential. The concept of financial intermediation is critically analysed in order to understand the drivers and benefits behind its use and continued dominance. Lastly, this session provides an introduction to big data as a material enabler of fintech activity and the foundation of machine learning analytics (discussed in a future session).

Learning objectives

- Understand the enabler layers as well as the technological applications relevant to the fintech landscape across financial services business models
- Dive deeper into the drivers and benefits behind intermediation and intermediaries
- Definitions, dimensions and applications of big data in fintech

Expected learning outcomes

- Understand the potential of fintech firms to enable or deliver innovation in their respective financial services industries
- Critically understand where intermediaries can be valuable
- Acquire a high level understanding of the big data landscape as an enabler for fintech business models

Agenda

- Introduction and recap
- Enablers or disruptors? A critical analysis of fintech models
- Intermediaries and financial intermediation
- Big data for fintech
- Concluding remarks

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- **Introduction and recap**
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Takeaways from previous sessions

Session 2 and 3	**1. Banking and insurance are umbrella terms**	▪ Both banking and insurance are not pure business models ▪ Rather, they are convenient terms referring to an amalgamation of business models that happen to be offered by these firms
Session 1	**3. Disruptive forces are more than mere innovation**	▪ Technological enablement: doing what we did before, better, faster or cheaper ▪ Technological business model innovation: new business modes using technology

What do these practically mean in terms of fintech applications to banking and insurance?

The fintech landscape should be understood amongst a number of layers

	Credit, deposit & capital raising	Payments, clearing & settlement		Investment management	Insurance
		Retail	Wholesale		
Technological applications	Crowdfunding	Mobile wallets	Real Time Gross Settlements	High frequency trading	P2P insurance
	Lending marketplaces	P2P transfers	FX wholesale	E-trading	On demand insurance
	Mobile banks	Digital currencies	Digital exchange platforms	Robo-advice	Micro insurance
	Credit scoring	FX conversions			Digital brokers
Enabler services	APIs, Open Source, Infrastructure				
	Data applications (big data, machine learning, predictive modelling)				
	Security (biometrics, customer identification and authentication)				
	Cloud computing				
	Distributed Ledger Technology (blockchain, smart contracts)				
	Internet of Things (IoT), mobile technology				
	Artificial Intelligence (bots, automation, robotics, algorithms)				
Enabler policies	Digital ID				
	Open Banking				
	Data protection				
	Cyber security				

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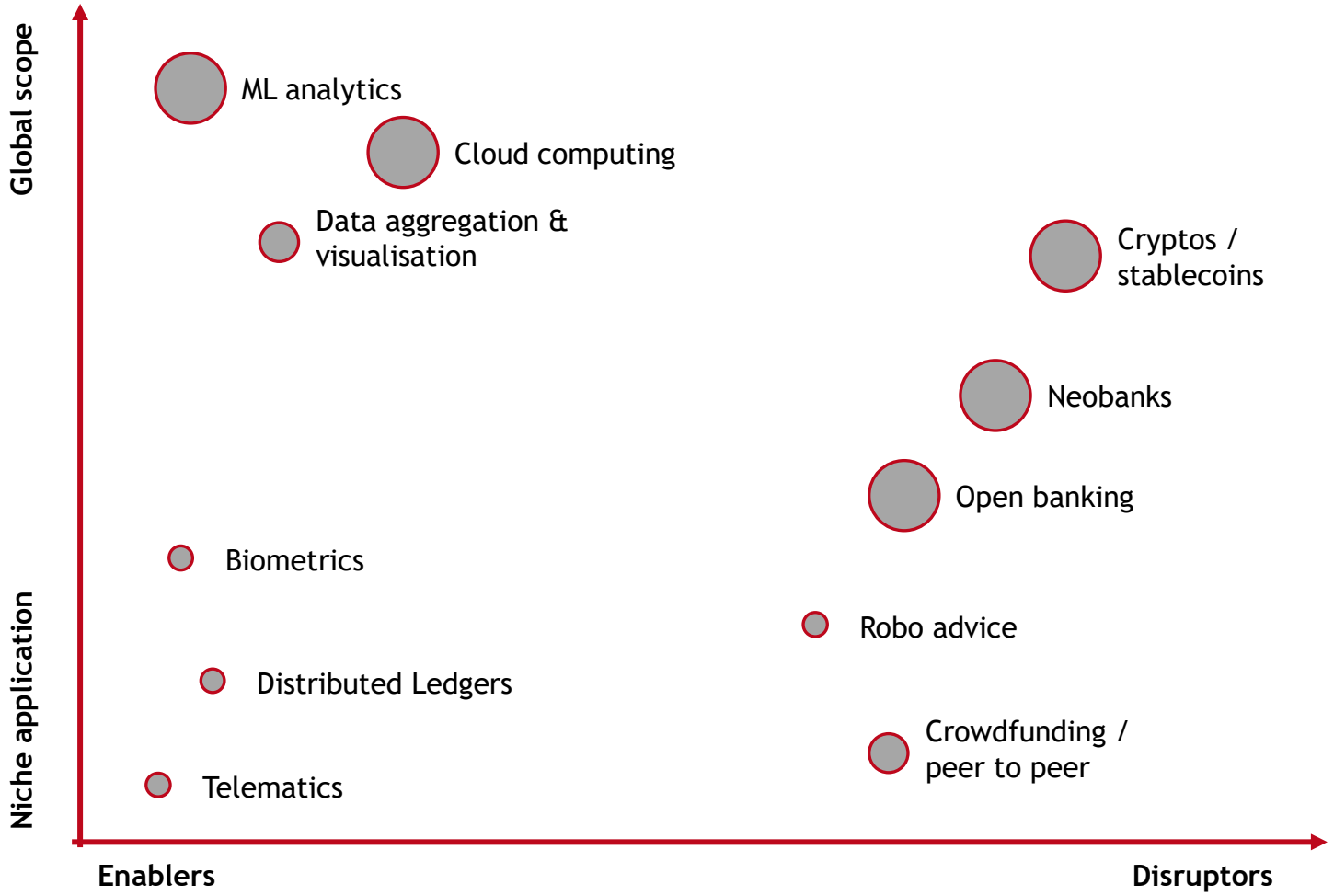
Fintech applications are more likely to be enablers rather than disruptors



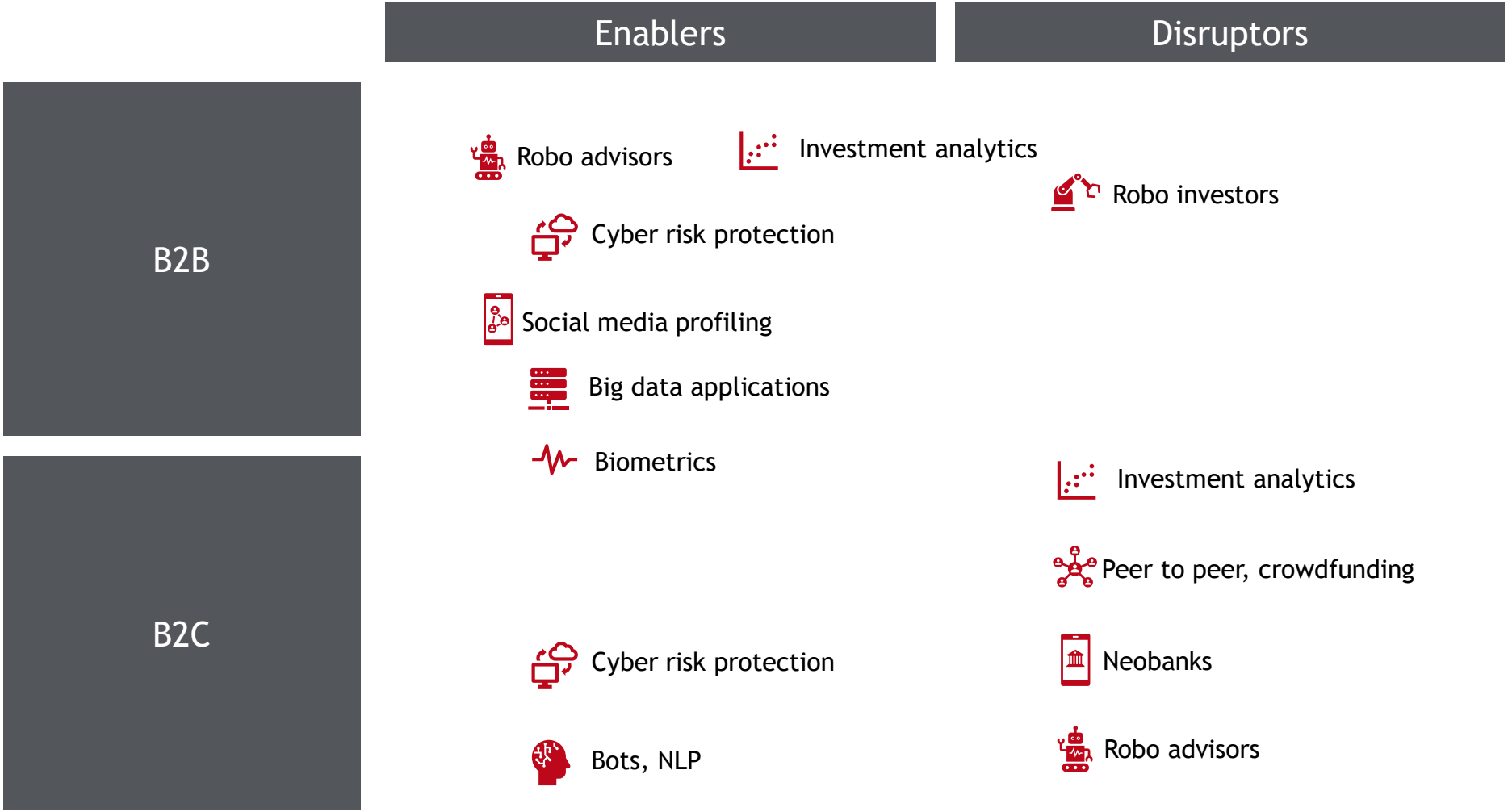
We have to understand fintech applications within the context of banking business models

Business Model	Enablers	Disruptors
Deposits	Mobile platforms	Neobanks
Loans	Credit analytics	Peer to peer, crowdfunding
Payments	Gateways	Peer to peer cash
Advisory	Investment analytics	Robo advisors
Data Management	Big data applications	Cyber risk protection
Customer Service	Bots, NLP	

And similarly for insurance business models

Business Model	Enablers	Disruptors
Underwriting	Individualised pricing Biometrics Social media profiling	Micro insurance On demand insurance Peer to peer insurance
Risk pooling		
Asset management	Robo investors	
Advisory	Investment analytics	Robo advisors
Data Management	Big data applications Cyber risk protection	
Customer Service	Bots, NLP	

The potential role (enabler versus disruptor) may vary, depending on the scope of the offering (B2B or B2C)



Takeaways

1. Fintechs can be enablers, disruptors, or both	▪ The nature of innovation depends on the type of offering, as well as its customer scope ▪ Fintech firms need to be clear as to where they are targeting their product

"Fintech can be a cost disruptor, a revenue disruptor and / or a revenue enabler"

Professor Michael King

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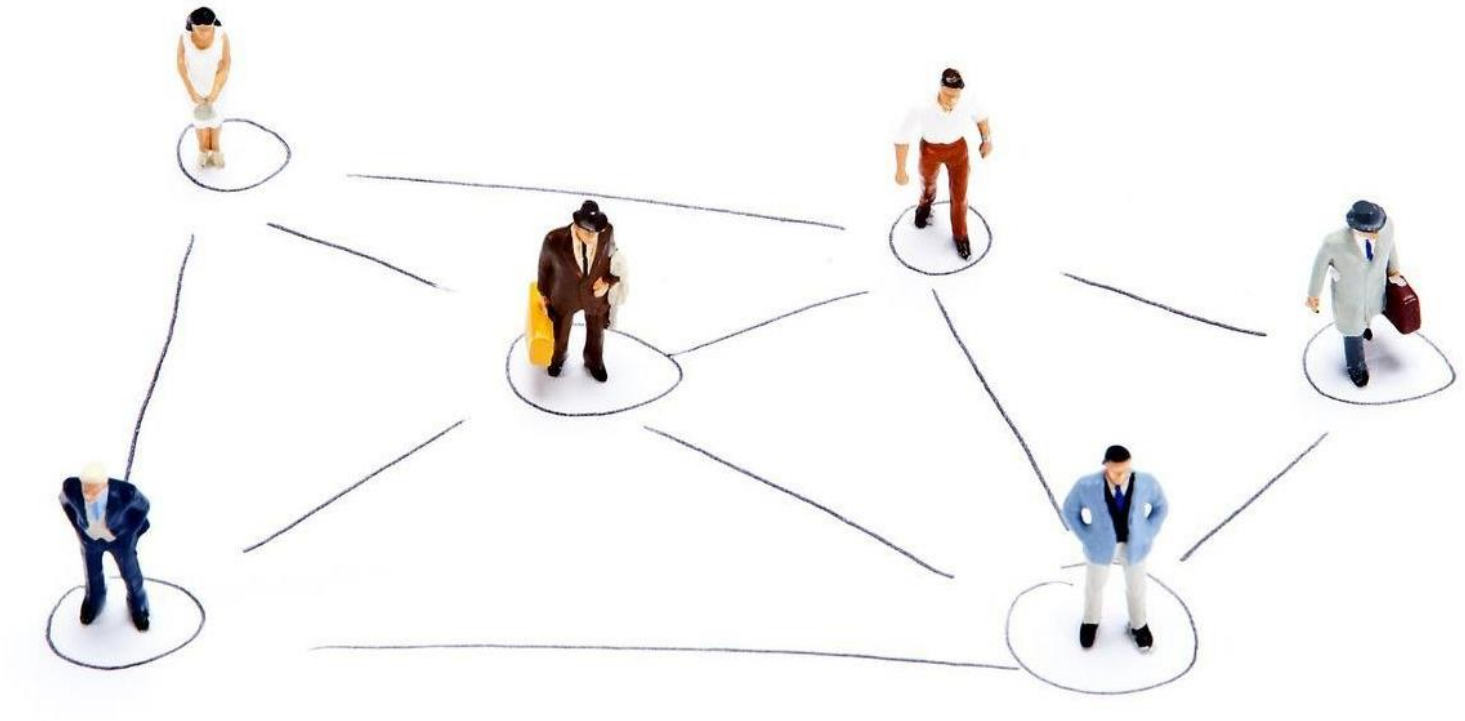
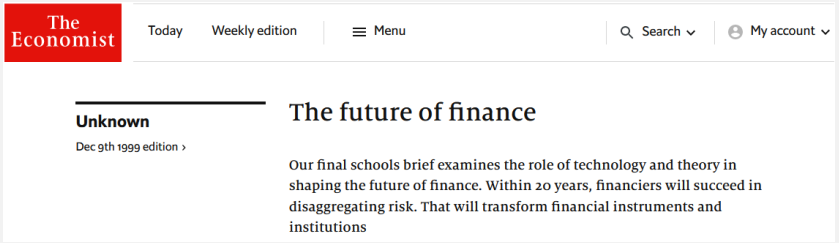
Question: Do you think intermediaries are good or bad?



The concept of intermediation is often portrayed in a negative light…

1990s:

The internet marks the death of intermediaries


The Economist

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The future of finance

Our final schools brief examines the role of technology and theory in shaping the future of finance. Within 20 years, financiers will succeed in disaggregating risk. That will transform financial instruments and institutions

https://www.economist.com/unknown/1999/12/09/the-future-of-finance

2010s:

Blockchain marks the death of intermediaries


Bitcoin: A Peer-to-Peer Electronic Cash System

Satoshi Nakamoto
satoshin@gmx.com
www.bitcoin.org

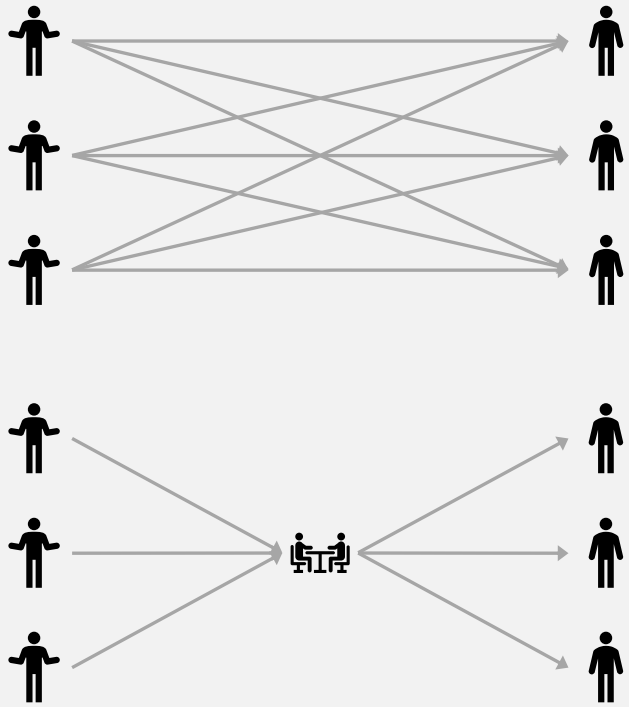
https://bitcoin.org/bitcoin.pdf

Nevertheless, today we have more intermediaries than ever before…

The reason is simple: intermediaries offer an economically valuable service

Why are intermediaries useful?
The practical perspective

Buying a house



- Intermediary vets buyers and sellers
- Can filter, consolidate and update information
- Offers additional services

'New intermediaries'

Uber

airbnb

amazon

- If you think about it, these are not only service intermediaries but also financial intermediaries!

Why are intermediaries useful?
The theoretical perspective

Information asymmetries

- Intermediaries hold specialist knowledge and can reduce information asymmetries between unknown parties
- Examples:
  - Airbnb know the quality of listings from customer reviews and onsite visits
  - Cryptographic algorithms ensure that transactions between unknown parties are settled

Transaction costs

- Intermediaries can reduce transaction costs, as one only needs to interact with a 'trusted' middle person
- Examples:
  - Airbnb makes it a lot easier to identify rental properties in a specific area
  - Cryptographic algorithms can minimise the transaction costs associated with payment processing

Practically, where information asymmetries and transaction costs are involved, there is value in having a trusted intermediary that manages risk and facilitates the flow of information and execution

Examples: Estate Agents, Central Banks

Allen and Santomero (1998)

Takeaways

2. Intermediaries can often be rather useful	▪ Where transaction costs and/or information asymmetry is high, intermediaries can be valuable economic participants

"You might call me a tech intermediary. I know how to talk to the people in Silicon Valley and then take that information and explain it to everyone else."

Marc Ostrofsky

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Question: What is big data?

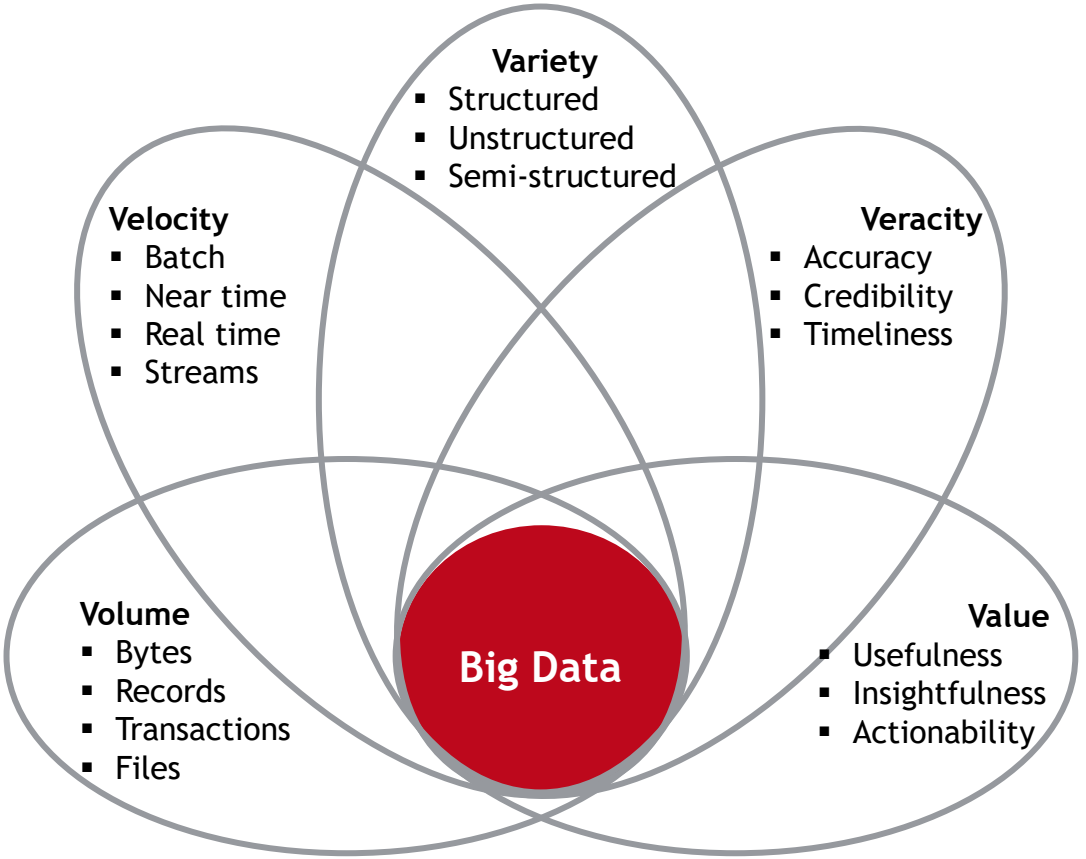
The big data landscape is immense and can be customised according to an organisation's preferences and needs

-- Illustrative: not an exhaustive list --

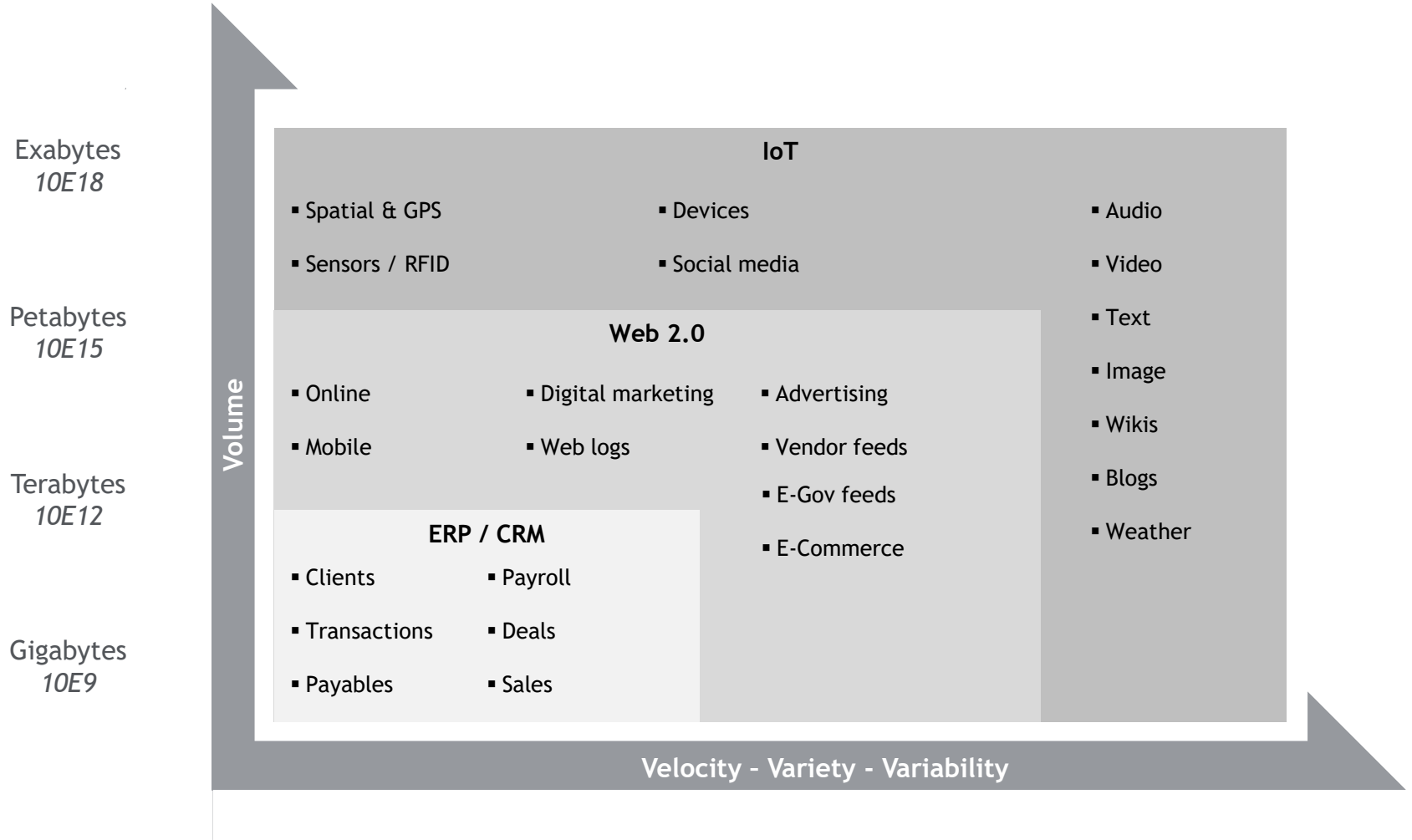
Definitions and dimensions

- **Data**: any piece of (digital) information, fact or statistic, including images, video and speech
- **Big data:** an umbrella term used to describe the vast scale of data produced and available for analyses
- **Data analytics:** qualitative and quantitative techniques and processes used to generate information, enhance productivity and create business gains
- **Big data analytics:** the application of advanced analytic techniques to very big data sets
- **Predictive analytics**: a better term than 'advanced analytics' as it focuses on outcomes rather than methods
- **Machine learning**: an approach that provides systems with the opportunity to automatically learn from experience without being explicitly programmed

Big data can be understood in terms of 5 dimensions



Big data is growing exponentially with the addition of further data sources and processing capabilities



Sources: Microsoft, TNP

Big data analytics should be attuned to the business objectives they aim to support

- Big data allows us to collect and analyse large amounts of data
- However, the most important objective is

doing something with it

The most important considerations for any big data project are the following:

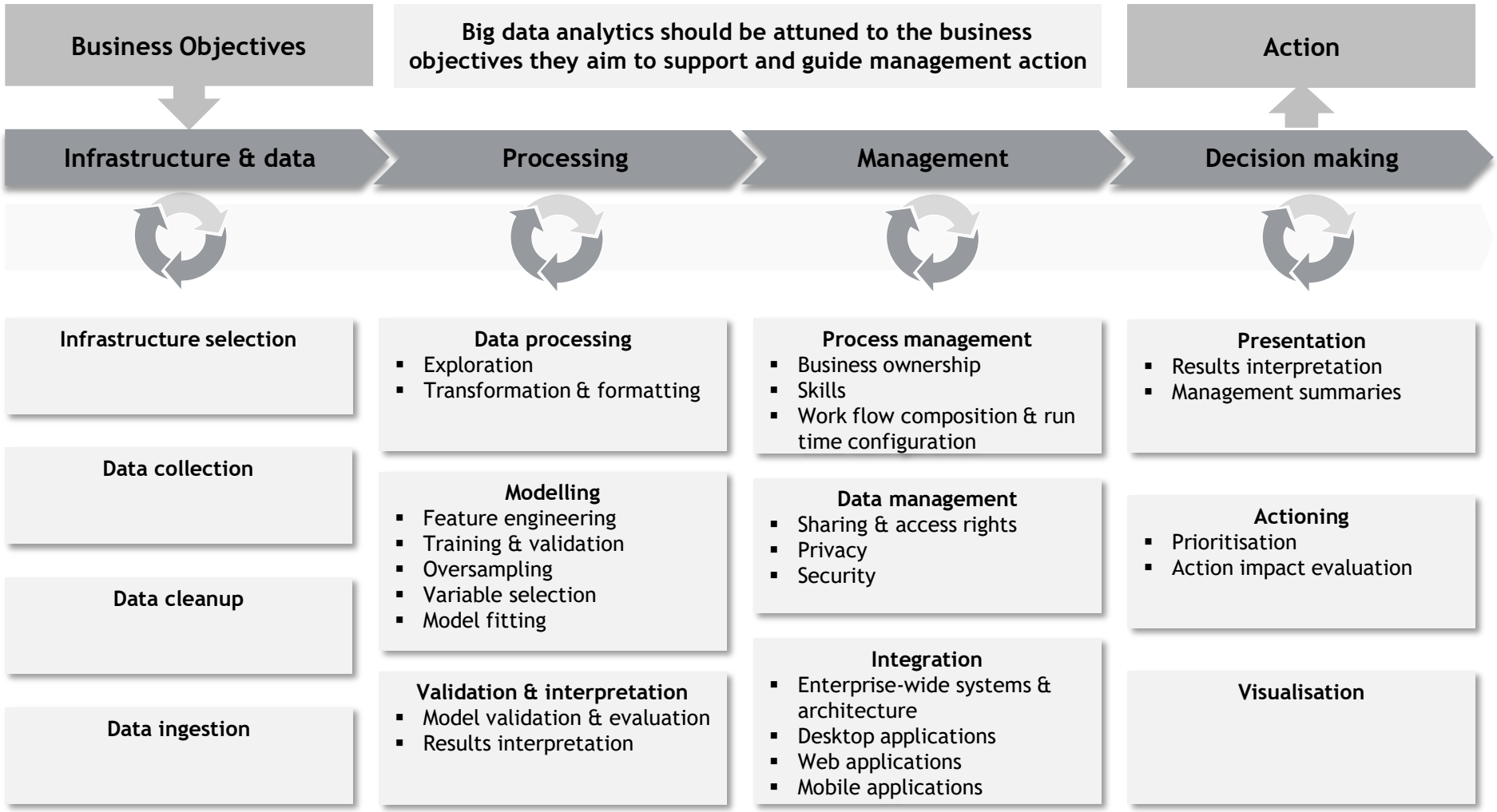
Answer the 'so what'
- The analyses should lead to actions, not just offer insights that are 'nice to know'
- In other words, focus on the implications, not the analysis

Answer the right question
- Decide what question needs to be answered before starting the analyses
- Unexpected answers are possible, but rare; focus primarily on what management is looking for

Tell a story
- It is easy to get lost in endless (interesting nonetheless) analyses and (impressive) graphs
- Use big data analytics to tell a story with clear management guidance and implications

Sources: IFC, Stanford University

Therefore, a big data life cycle should aim to provide input for actionable decisions

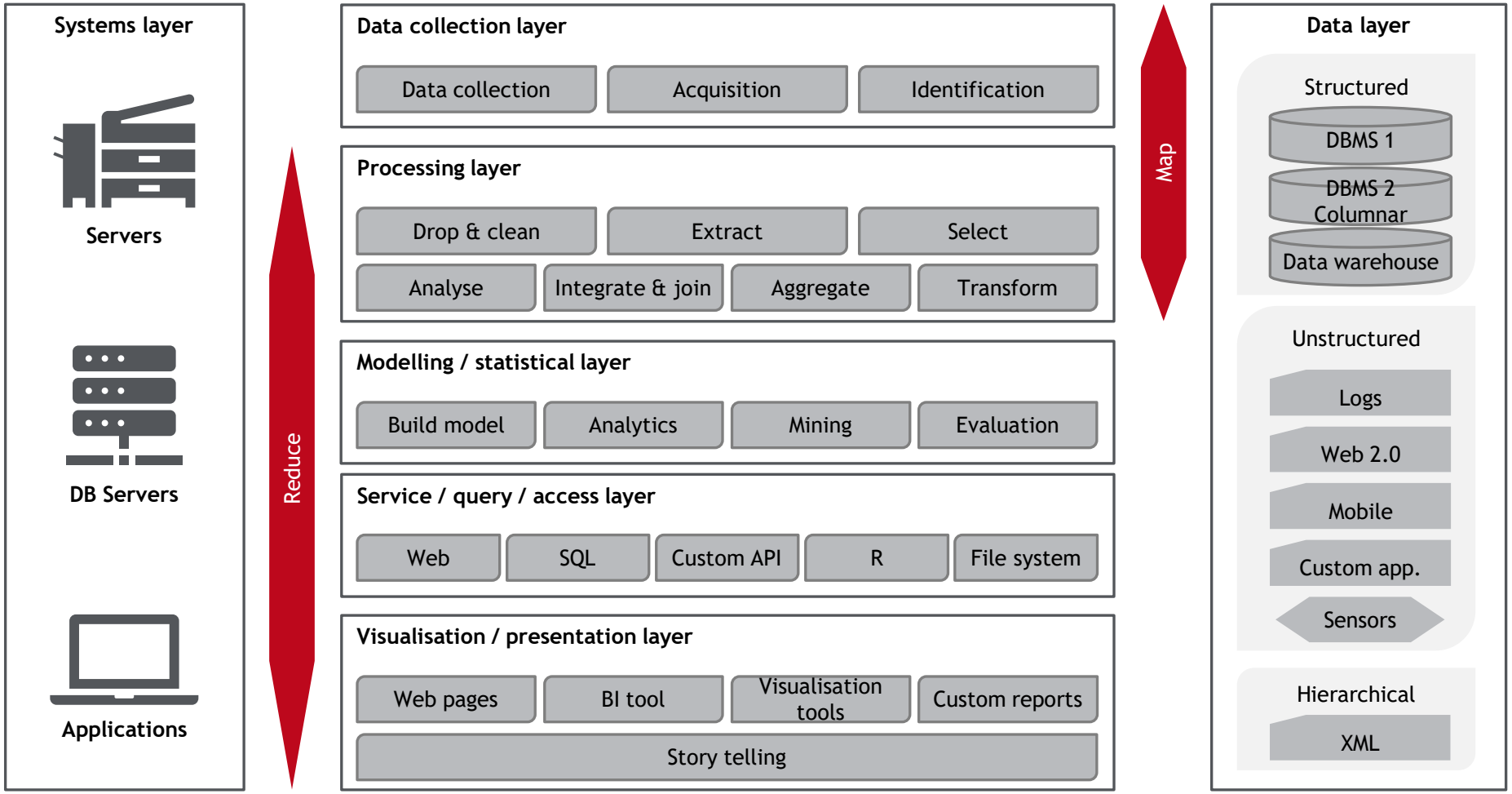


The methods for (big) data analytics can be understood from descriptive to prescriptive

Information → Insights → Predictions → Decisions / Actions

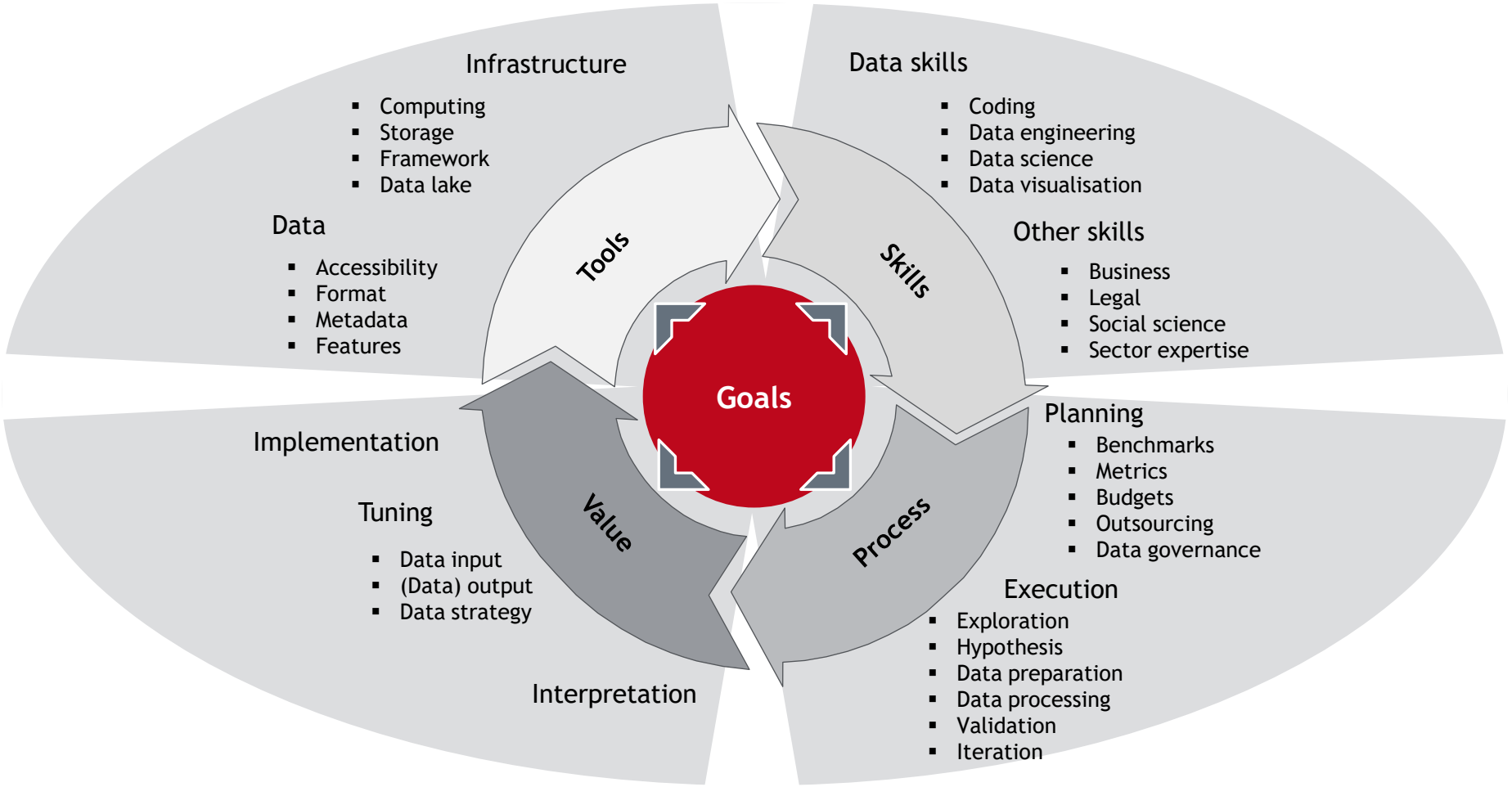
	Descriptive analytics	Diagnostic analytics	Predictive analytics	Prescriptive / pre-emptive analytics
Objectives	What happened? What is happening now?	Why did it happen?	What is likely to happen in the future?	What should be done to make a future outcome happen? What is required to achieve more?
Techniques	Alerts, querying, searches, reporting, static visualisations, dashboards, tables, charts, narratives, correlations	Regression analyses, A / B testing, pattern matching, data mining, forecasting, segmentation	Machine learning, Social Network Analysis (SNA), geospatial pattern recognition, interactive visualisations	Graph analyses, neural networks, machine learning, deep learning
Tools	   Power BI    			

Conceptually, a big data architecture can be visualised as follows



Adapted from Tekiner and Keane (2013)

When managing a data project, the Data Ring provides a useful reference point for incorporating the appropriate skills, processes, outcomes and tools



* Adapted from Camiciotti and Racca (www.dataring.eu)

Is big data already becoming a thing of the past? The journey towards Multi-Cloud, Machine Learning and Real Time & Ubiquitous Context

Is traditional big data becoming a thing of the past?

- Even though it is too early to announce the 'death of big data', the volume and velocity of data generation have already made MapReduce approaches an aging technology

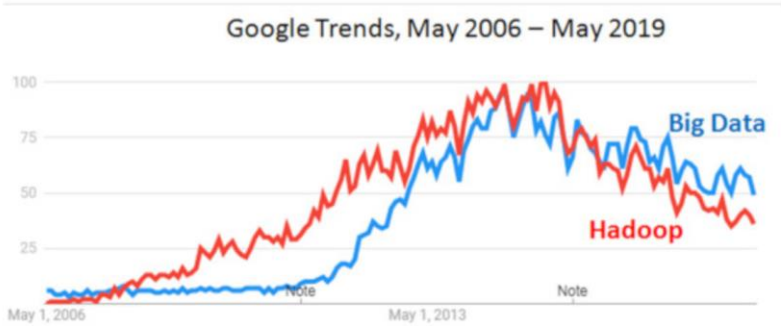
Google has abandoned MapReduce, the system for running data analytics jobs spread across many servers the company developed and later open sourced, in favor of a new cloud analytics system it has built called Cloud Dataflow.

Urs Hölze, SVP Google, June 2014

Cloudera plummets 43% after CEO abruptly departs and company cuts forecast

PUBLISHED THU, JUN 6 2019 • 11:13 AM EDT | UPDATED THU, JUN 6 2019 • 7:21 PM EDT

CNBC



What does the immediate future look like?

"With the Era of Big Data coming to an end, we now can focus less on the mechanics of collecting large volumes of data and more on the myriad challenges of processing, analyzing, and interacting with massive amounts of data in real-time."

Hyun Park, Amalgam Insights, July 2019

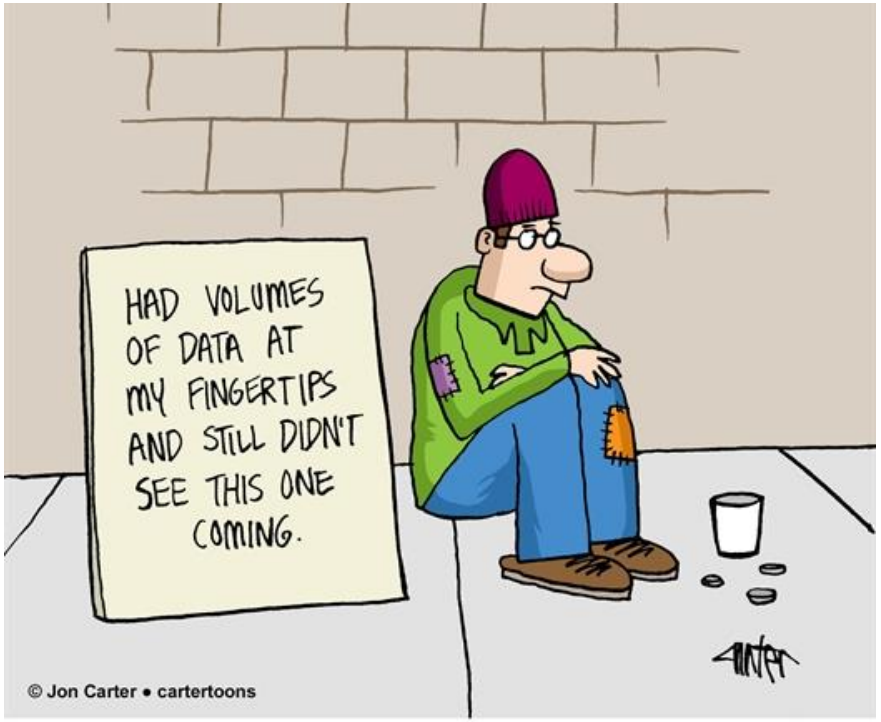
- **Multi-cloud:** speaks to the increasing need to support applications and platforms across multiple clouds based on the variety of applications in place and the increasing need for supporting continuous delivery and business continuity
- **Machine Learning:** Focuses on analytic models, algorithms, model training, and deep learning. ML requires much of the same work needed to create clean data for analytics, but also requires additional mathematical, business, and ethical context to create lasting and long-term value
- **Real time & ubiquitous context:** Speaks to the increasing need for timely updates both from an analytic and engagement perspective. To provide this level of interaction, data must be analyzed at the speed of interaction, which can be as short as 300-500 milliseconds to provide effective behavioral feedback

Sources: Google I/O conference 2014, www.kdnuggets.com, www.datacenterknowledge.com, www.cnbc.com,

Takeaways

3. Big data is an important enabler of the '4th industrial revolution'

- Big data can be understood in terms of five dimensions: variety, volume, velocity, veracity and value
- The challenge with big data is not availability, but rather the ability to analyse it and derive management conclusions



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Any questions?

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Questions?

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