

Broadening the data base for deepening the focus?

The use of big data analytics in transaction banking

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What are we going to talk about?

1 **Techniques** of big data analytics

2 Current **applications**

3 Use in **transaction** banking

4 Use in **central** banking

What is big data?

3, 4 or 5 Vs

1

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Volume

...terabytes, petabytes, exabytes, zettabytes, yottabytes – IoT makes it possible!

Velocity

Real-time log files, GPS and sensors almost produce streaming data

Variety

Numbers, text, voice, pictures, video sequences,...

Veracity

Accuracy, completeness, reliability of mass data?

Value

Insights, correlations, causality, explanatory power?

How to compile a data set?

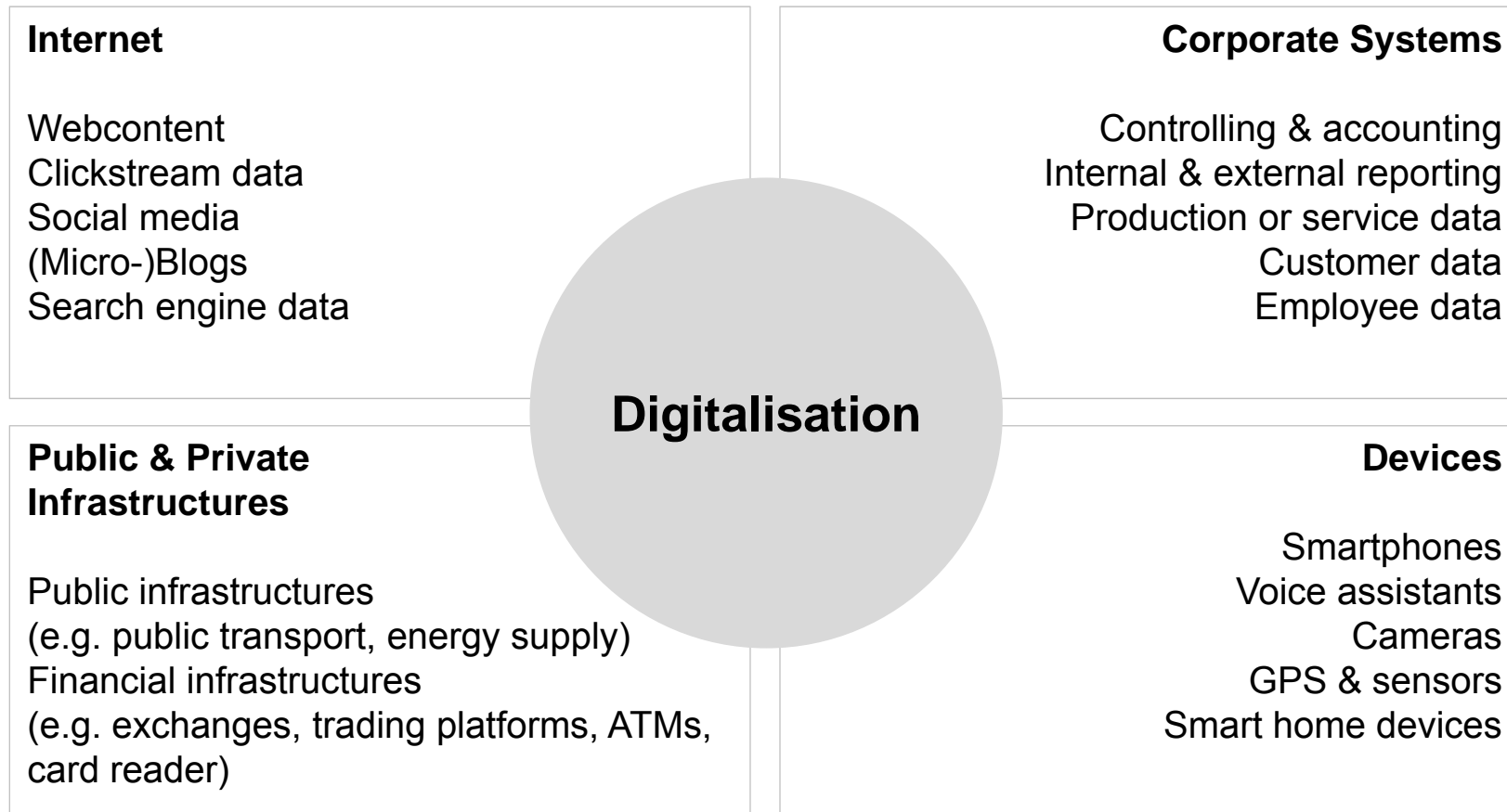
Different sources, formats and content

1

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How about the analytics?

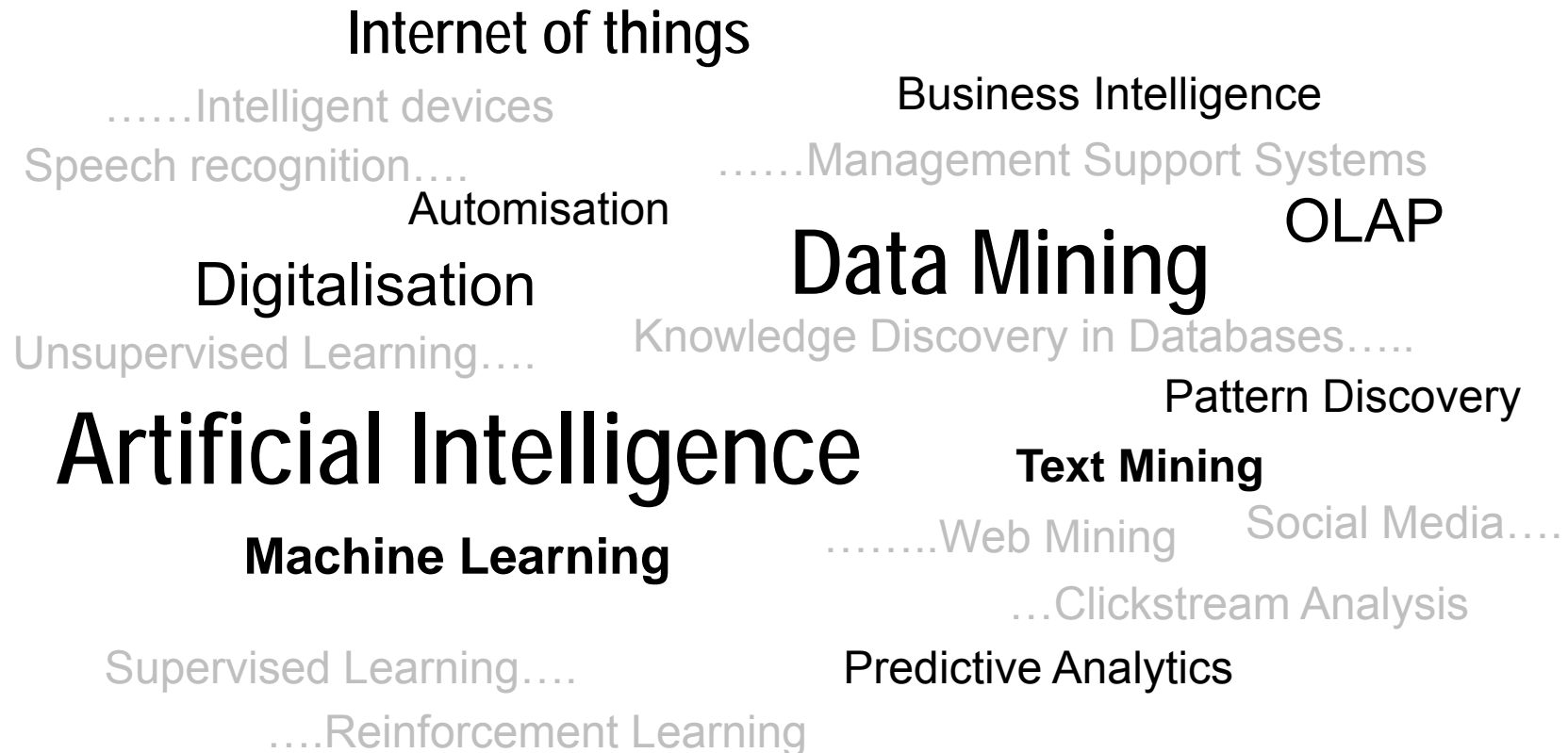
Buzz words wherever you look...

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Can AI help?

Machine learning methods

1

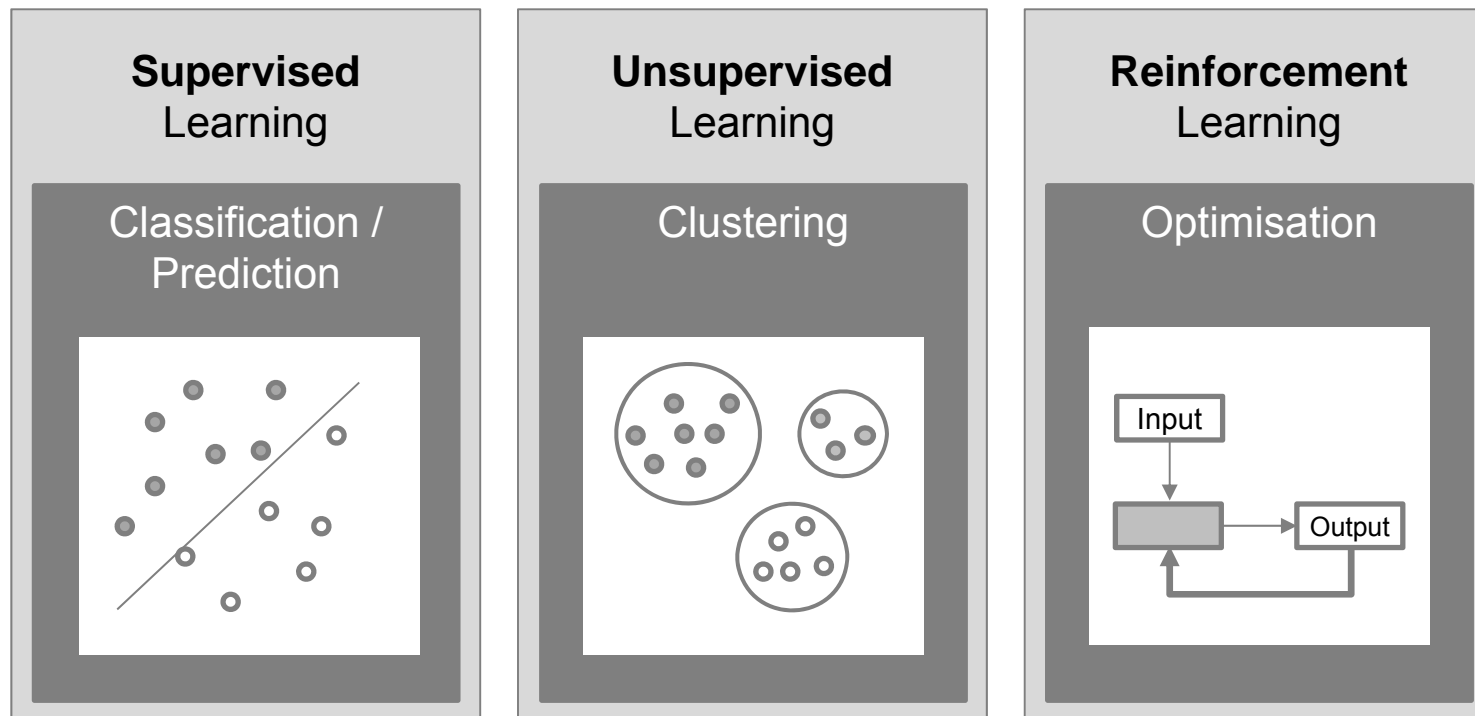
2

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Machine Learning (ML)

= algorithms that autonomously find and improve a decision logic by iterations



Graphics slightly adjusted from Raschka (2016)

How to use BDA in the financial industry?

Prominent use cases

1

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I

Customer Relationship Management & Targeted Marketing

- Customer profiling
- Strategic decision support
- New product development

II

Risk Management & Regulatory Reporting

- Credit scoring models / Default prediction
- Fraud detection
- Text mining for compliance and auditing

III

Capital Markets & Asset Management

- Forecasting prices and recognising trends
- Sentiment analysis
- Risk assessments

How to use BDA in transaction banking?

Data assessment

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- **Reference data**
e.g. personal data, legal entity information, country,...
- **Payment transactions**
e.g. value, time, sender, receiver, credit lines, limits,...
- **Portfolio data**
e.g. collateral, risk measures,...
- **Market data**
e.g. securities prices, benchmark prices, trends,...
- **Participant data (public)**
e.g. balance sheet information, risk reports, credit ratings...

How to use BDA in transaction banking?

Focus areas so far...

1

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Classification

Anomaly detection in transaction patterns

Triepels et al. (2017)

Risk management and fraud detection

Butaru et al. (2016)

Zareapoor/Shamsolmoali (2015)

Default prediction

Khadani/Kim/Lo (2010)

Forecasting

Market return forecasting

Huang et al. (2005)

Risk indicator forecasting

Plakandaras et al. (2014)

Sentiment analysis

Azar/Lo (2016)

Sprenger et al. (2014)

Bollen/Mao/Zeng (2011)

How to use BDA in central banking?

... and the way forward

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Can we...

- ... **predict a RTGS participant's liquidity needs** from individual transaction patterns?
- ... **optimise system-wide intraday liquidity management** in an RTGS by using a neural network?
- ... **forecast consumption** from analysing aggregate transaction patterns in retail payment systems?
- ...?

How to examine the value added of AI as a central bank?

Some questions for central banks

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AI methods as a „black box“

How efficient and secure can FMI operations with AI be?



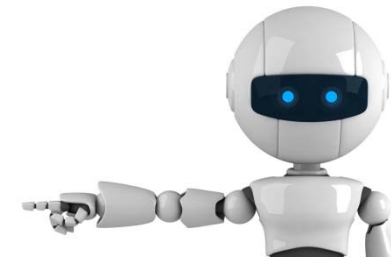
Comparative analyses – Classic vs. Cool?

Has AI any advantage compared to established FMI operations?



Reliability and trust

How much responsibility can be transferred to AI in automatic decision making?



Sources

- <http://blogs.lse.ac.uk/impactofsocialsciences/2015/05/08/interpretation-in-evidence-based-medicine/>
- https://www.123rf.com/photo_13470955_a-green-two-way-street-sign-pointing-to-old-and-new-letting-you-choose-for-something-older-or-newer-.html
- https://www.123rf.com/photo_10065298_funny-robot-stay-and-show-attention-from-hand-and-fingers.html

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