



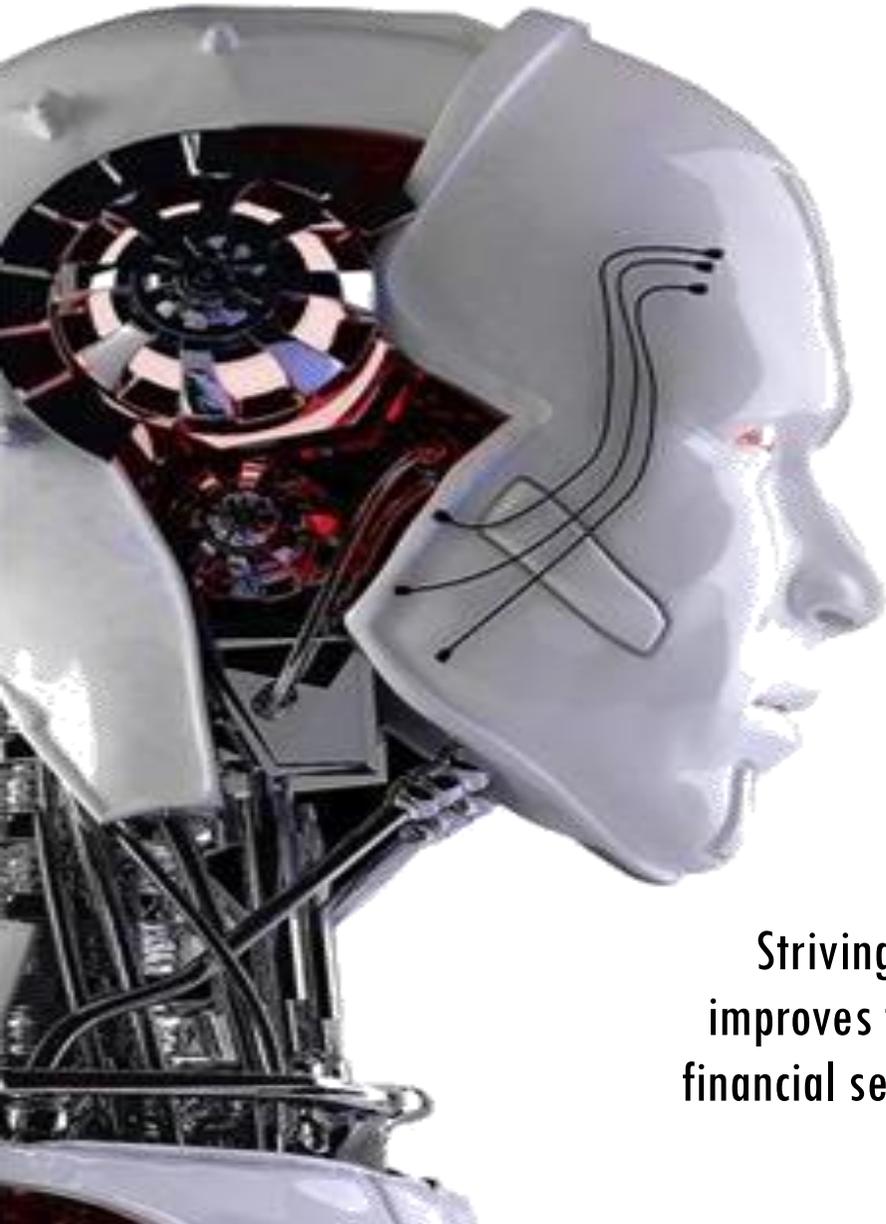
Monetary Authority of Singapore

# Data Analytics

**Dr Li Xuchun**  
**Head of Supervisory Technology Office**  
**Data Analytics Group**  
**Monetary Authority of Singapore**



# A TRANSFORMATIONAL VISION



## DOING BUSINESS AS UNUSUAL



Striving for digital transformation and innovation that improves the lives of individuals, progresses the Singapore financial sector, and contributes to the global financial agenda



1

# The Data Explosion





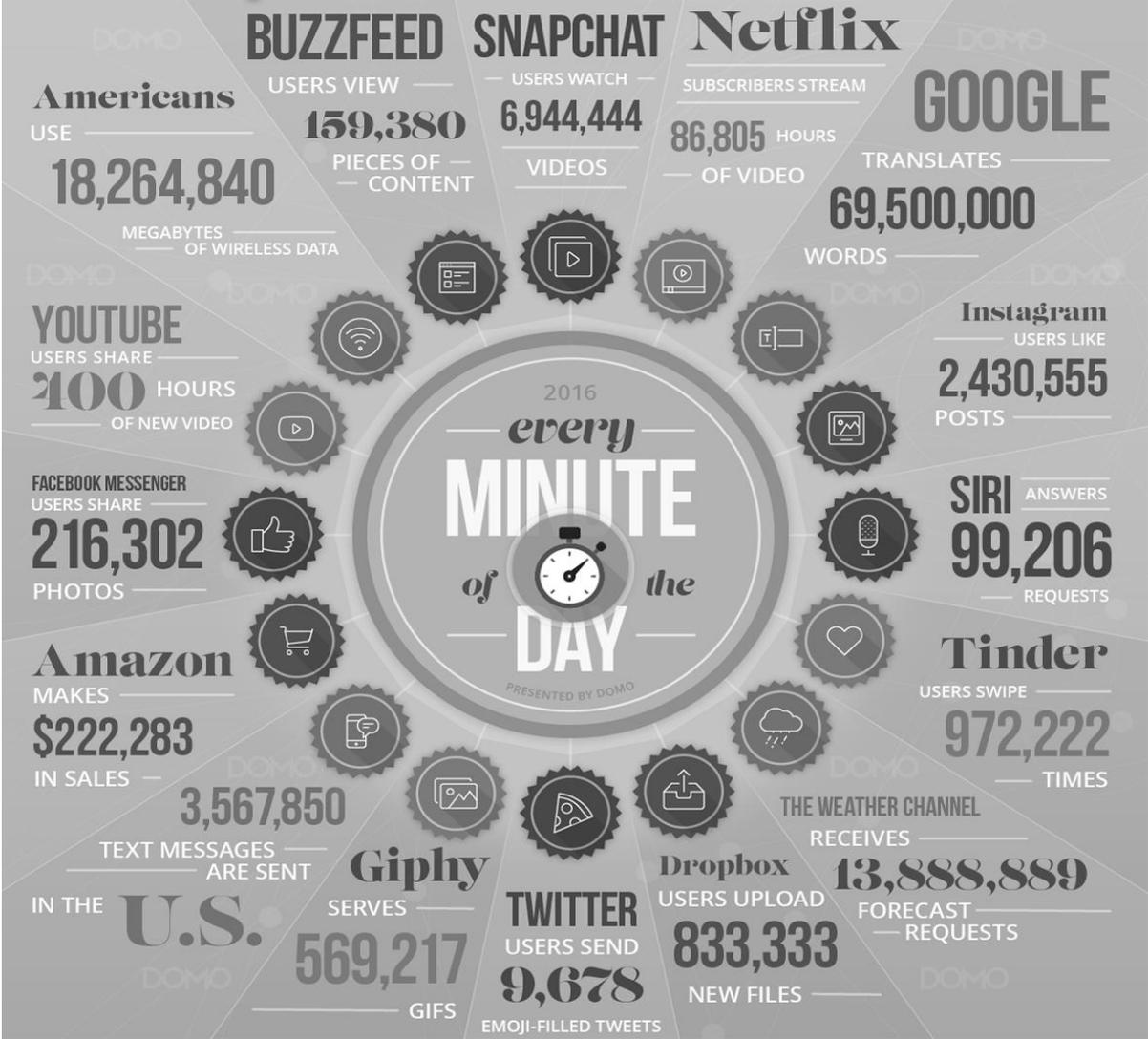
# WAR IS 90% INFORMATION

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Napoleon Bonaparte

Why the hype today?

# Availability of Data



Source: [www.domo.com](http://www.domo.com)

# What is financial services going to look like?



Data is the new <sup>AIR</sup>~~currency~~



Insight is the new store of value



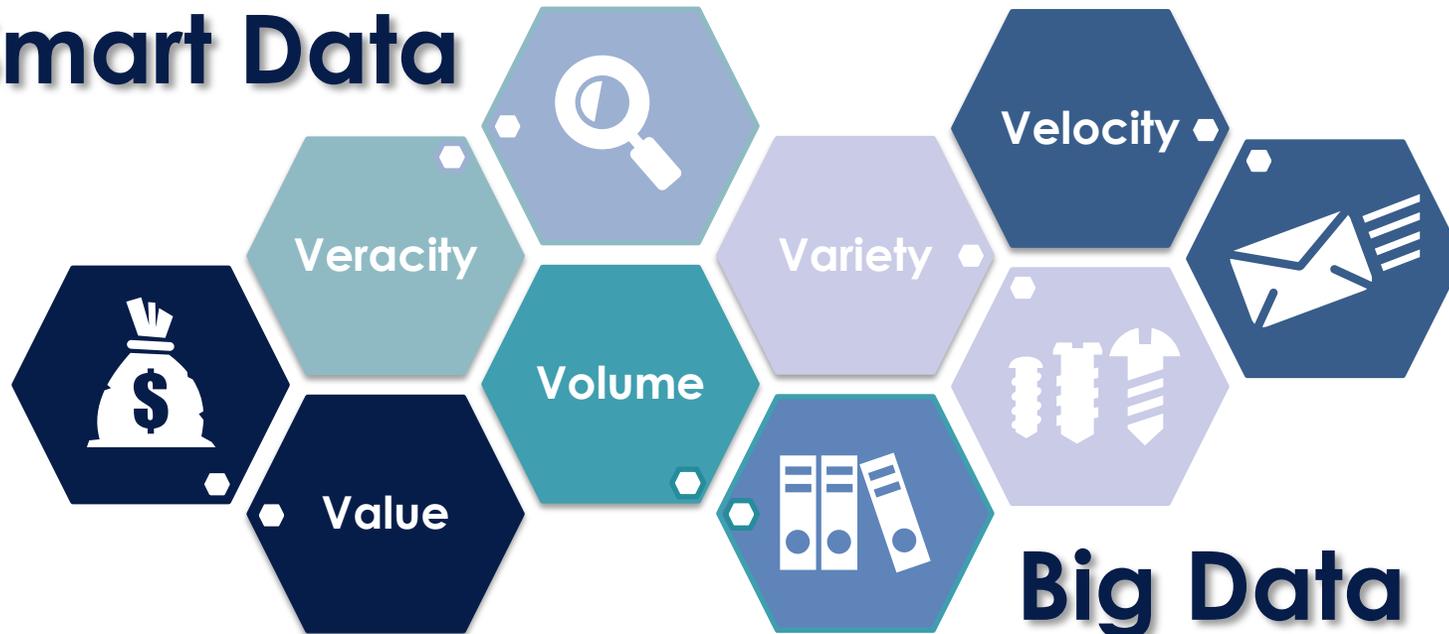
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# Big Data to *Smart* Data

What is the difference?

# The 5Vs of Data

**Smart Data**



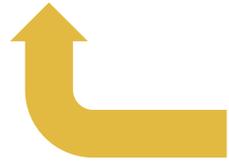
What is the difference?

## The 5Vs of Data

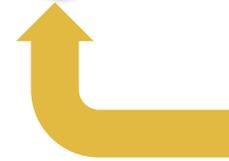
**Smart Data**



**Actions**



**Insights**



**Big Data**

How do we move from Big Data to Smart Data?

# Which should come first, business objectives or data?

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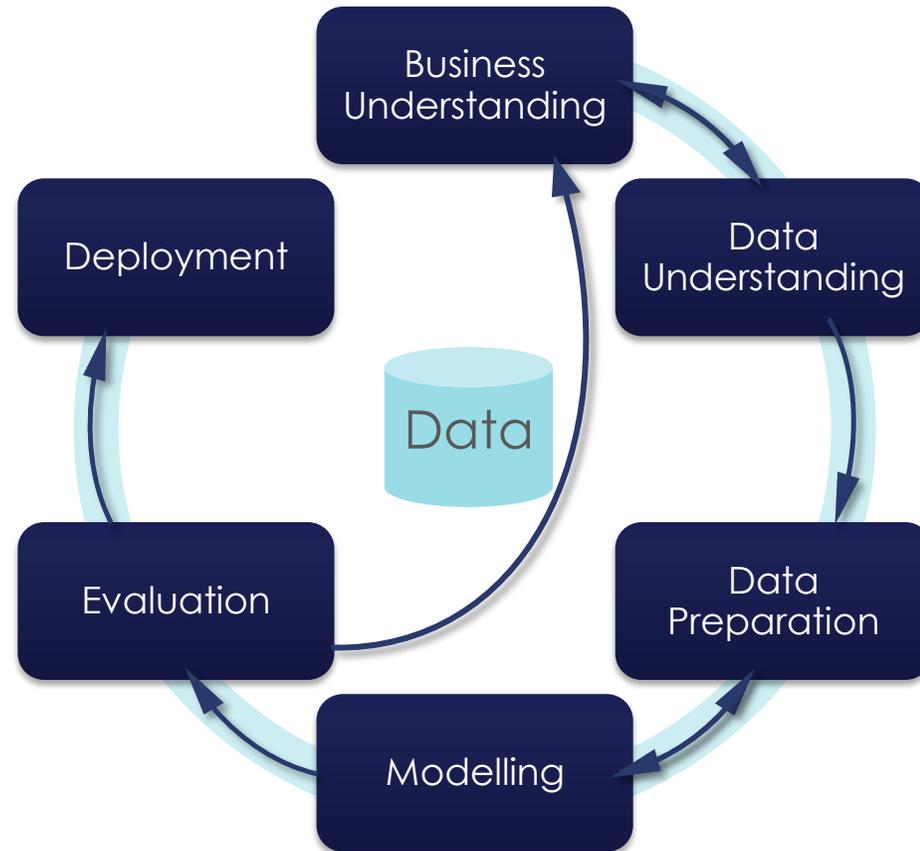
**You never lead with the data,  
and you never lead with the  
technology.**

**You lead with the problem.**

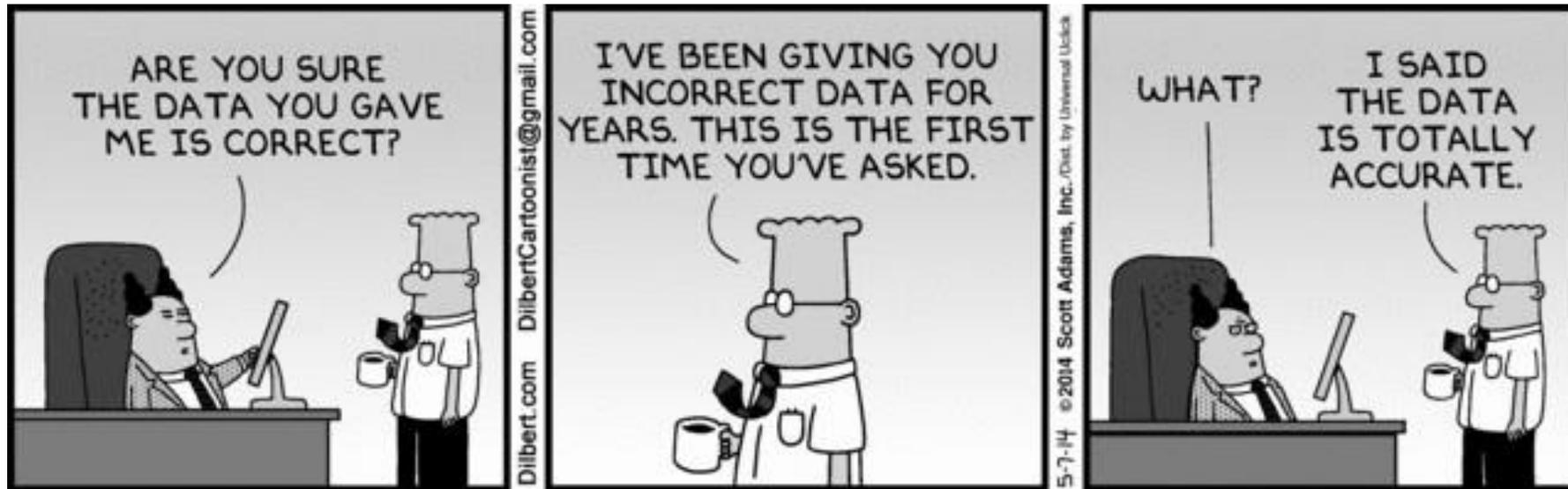
Anthony Scriffignano  
Chief Data Scientist, Dun & Bradstreet

How do we move from Big Data to Smart Data?

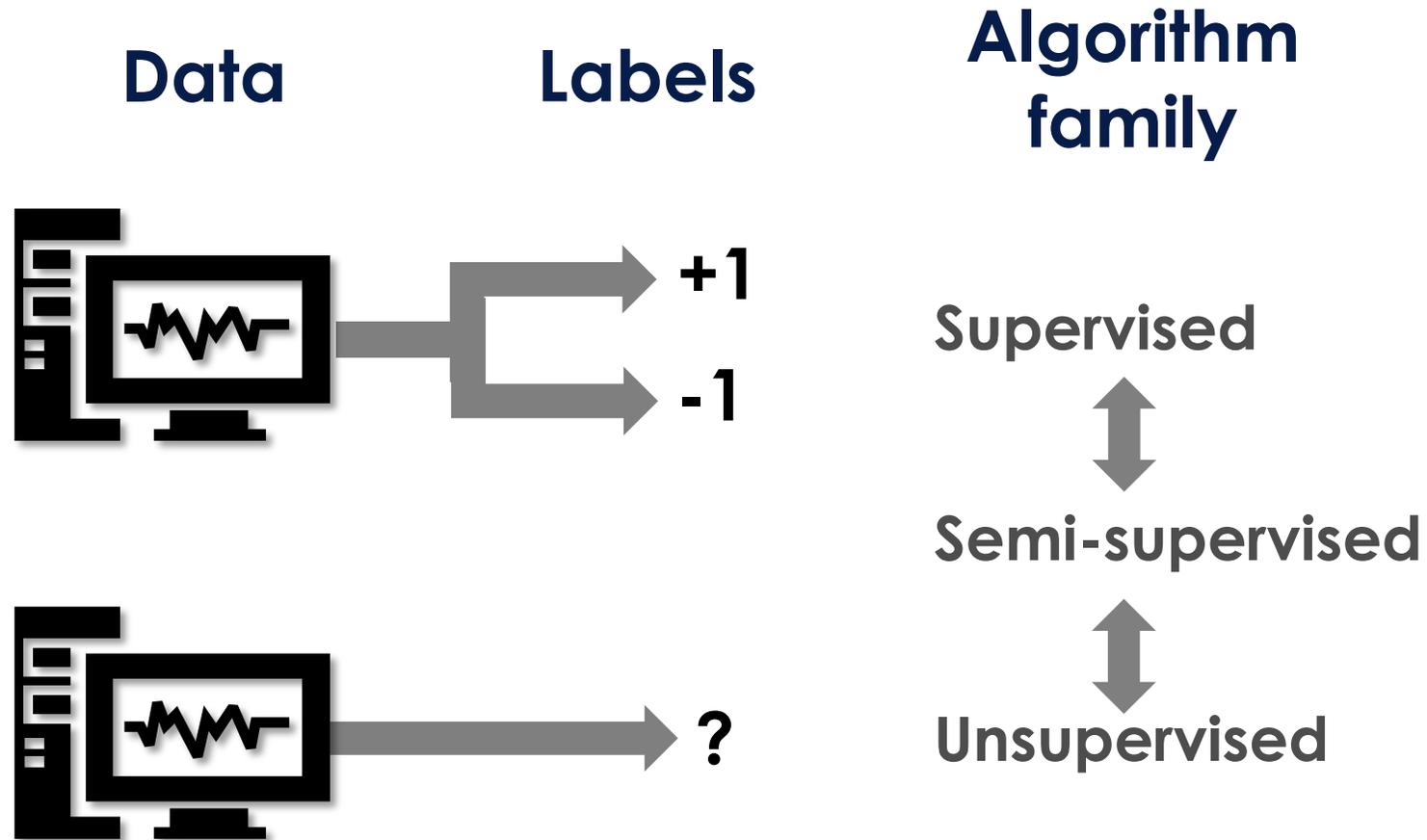
## Start with the **BUSINESS OBJECTIVES**



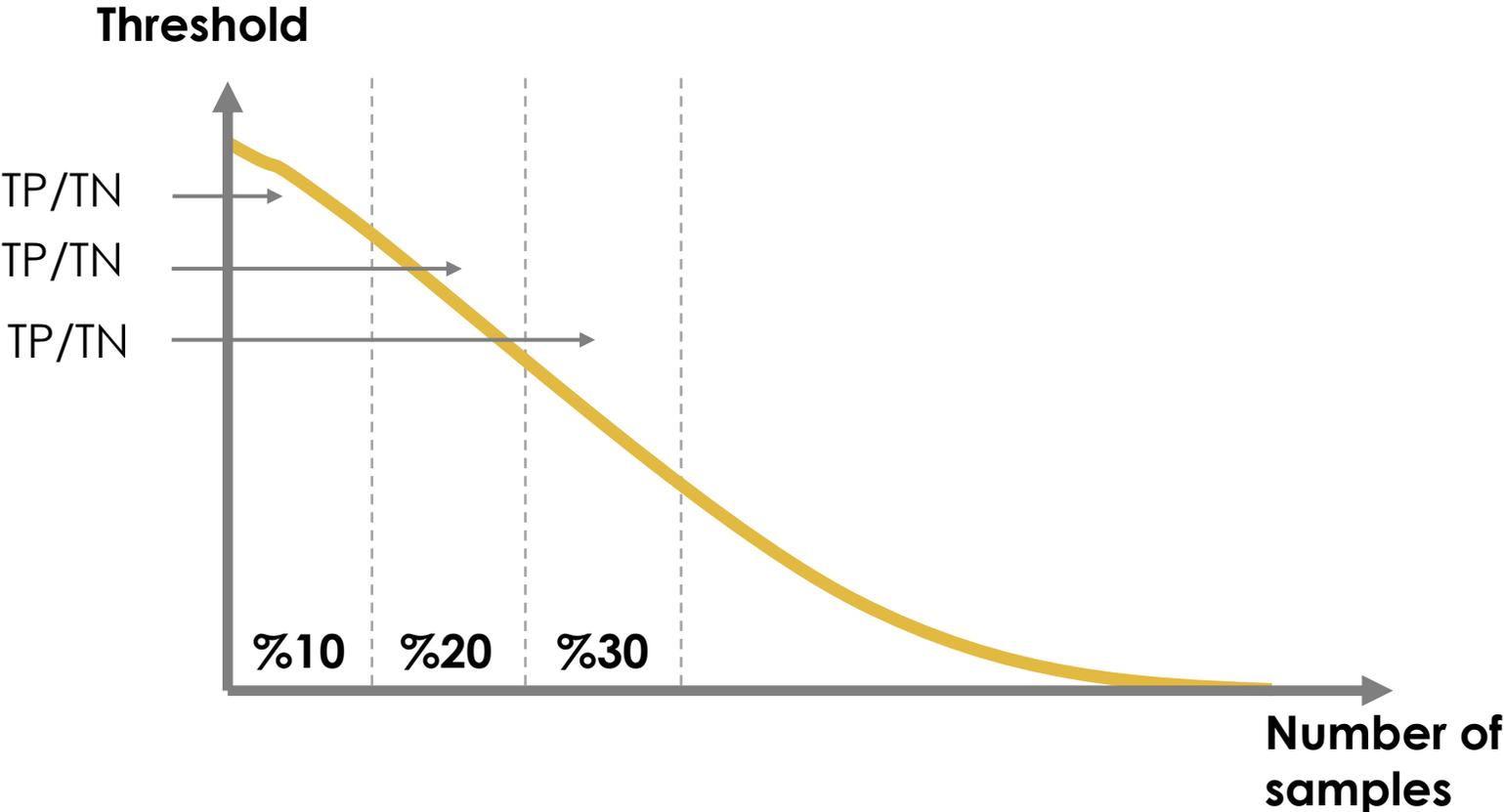
# Enforcing data **QUALITY**



# Using suitable **METHODS**

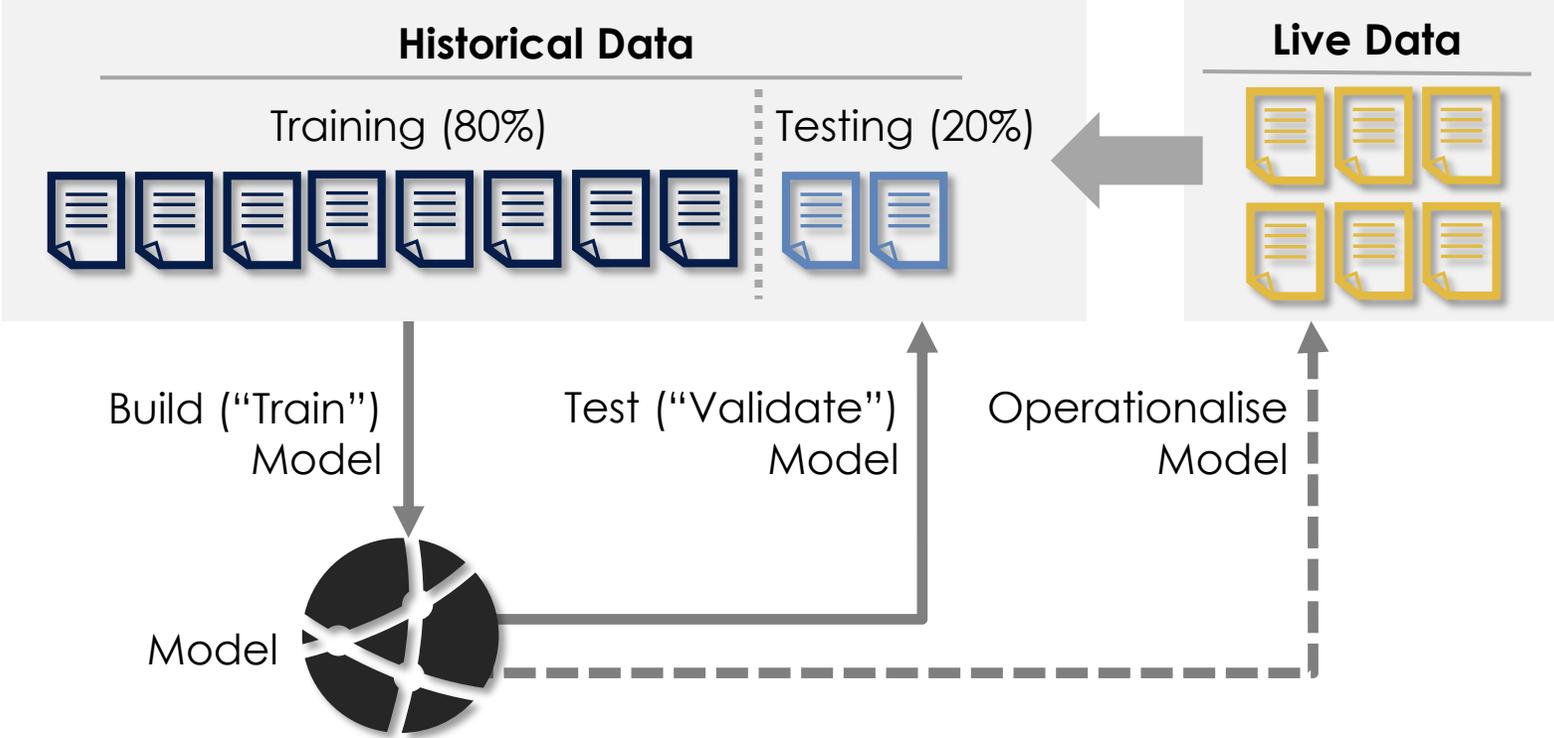


# Checking for **ACCURACY**



# How do we move from Big Data to Smart Data?

## Achieving **GENERALISABILITY**



## Ensuring **INTERPRETABILITY**

- **Easily understood.** Who is the audience? What is their level of technical expertise? Do they understand the model?
- **Yield simple and direct insights.** Do the results make sense?
- **Serve the business objective.** Does the model answer the problem statement?



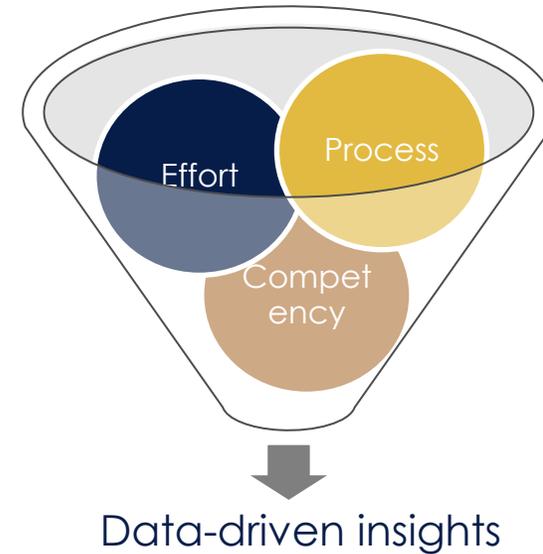


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# Applying *Smart* Data

# 7 Habits of the New Paradigm

- 1 Know the question** you are trying to answer
- 2 Understand the data** inside out
- 3 Find the right algorithm** for the job. Complexity may not be better
- 4 Be aware of limitations** in the data, algorithms, conclusions
- 5 Be skeptical.** Question the data, assumptions, results
- 6 Automate** to free up time to contextualise the results
- 7 Experiment.** Don't be afraid of trying and failing, and trying again. Go for a "fail-fast" approach



What are the pitfalls?

## Pitfalls to Avoid

- 1 Lack of project management
- 2 Perceiving data as technology projects
- 3 Over interpretation/extrapolation of results
- 4 Absence of culture for converting insights into actionable outcomes

# Where are you on your digital journey?

## How is your organisation:



collecting, storing and using your data?

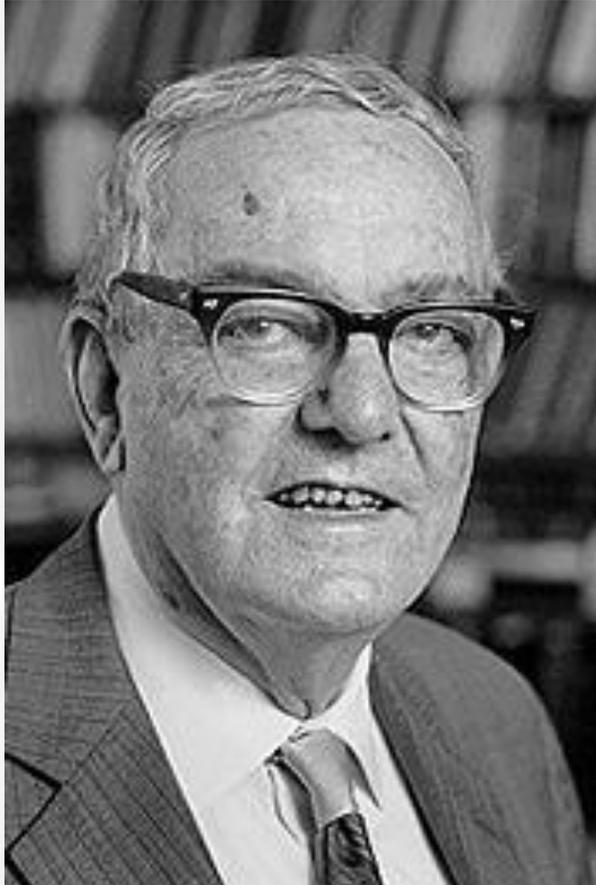


using data to drive insights and decision-making?



making analysis repeatable and shareable?

# What is learning?



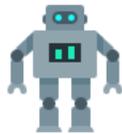
**“Learning is any process by which a system improves performance over experience.”**

Herbert Alexander Simon  
Winner of 1975 Turing Award & 1978  
Nobel Prize in Economics

# What is machine learning?



Computer programmes that automatically improve their performance through experience (data)

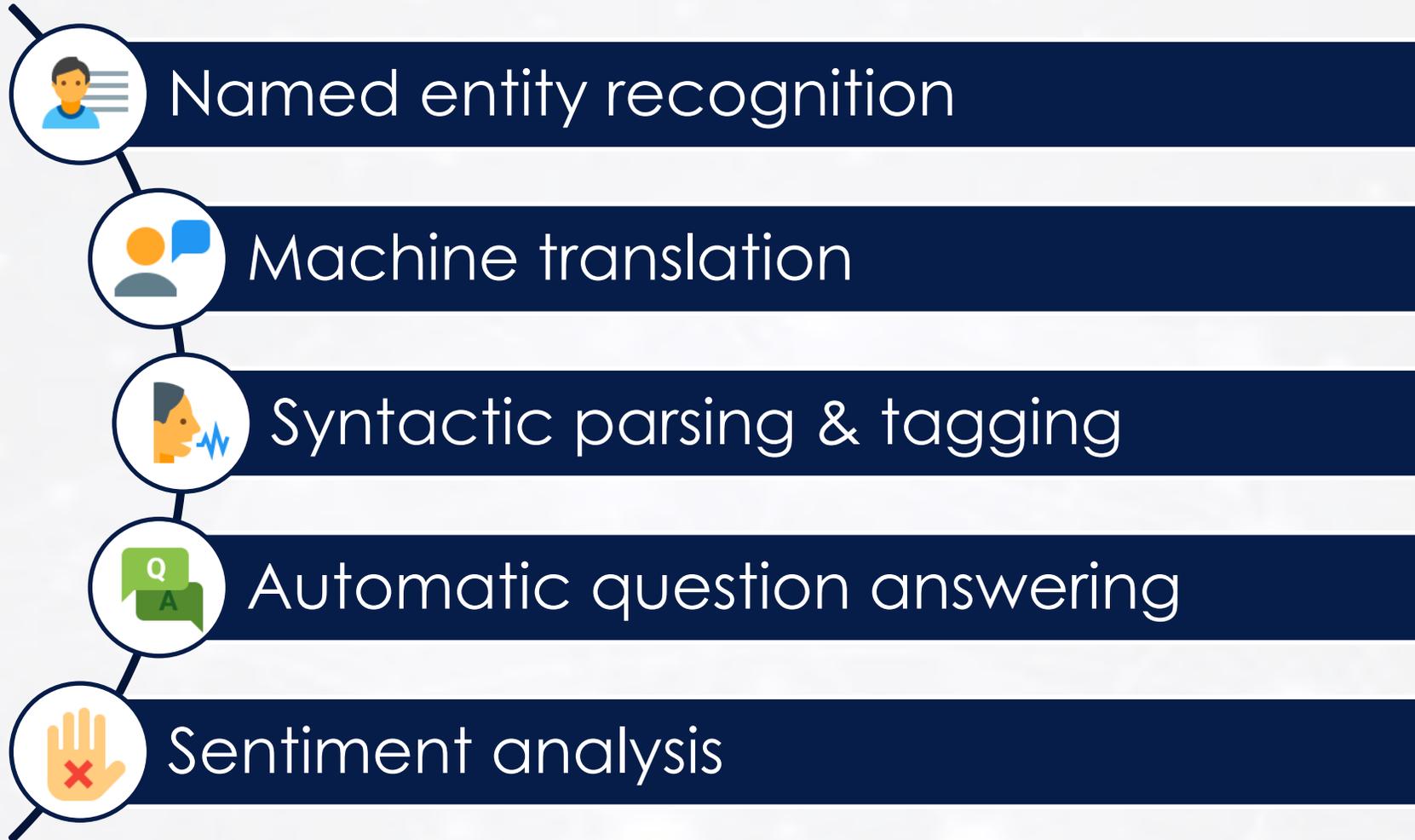


Subfield of artificial intelligence



Building blocks

# What is natural language processing?

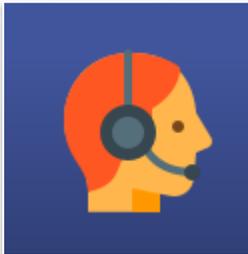
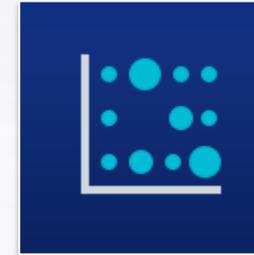


# Why machine learning & natural language processing?



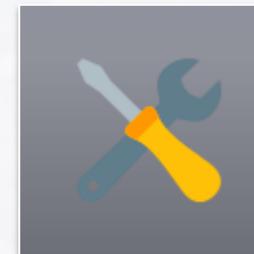
Automatically adapts and customises to individual users

Discovers new knowledge from large datasets



Mimics humans and replaces certain monotonous tasks

Develops systems that are too difficult or expensive to construct manually



# The data value chain



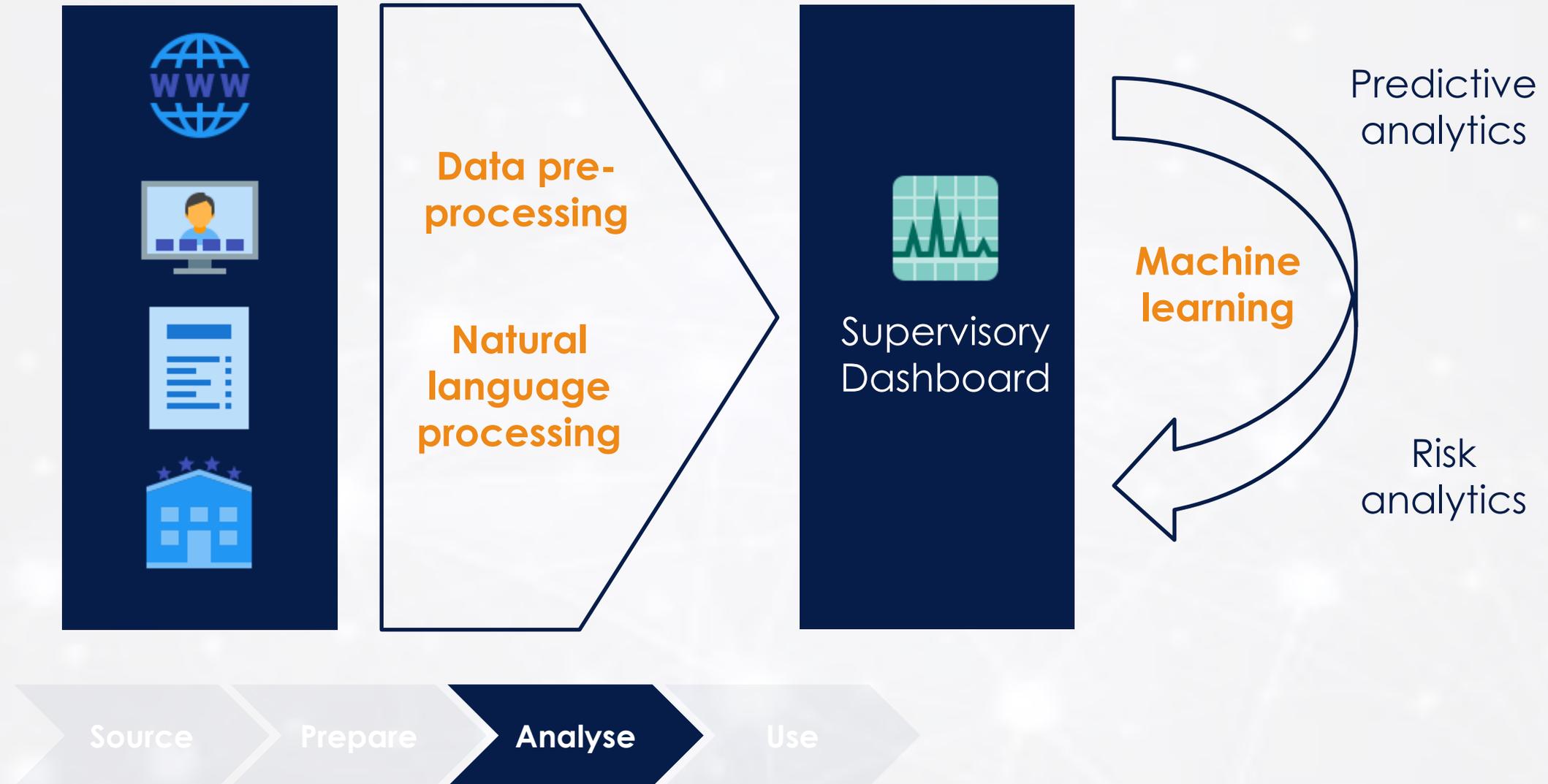
- What data do I need?
- Where do I find it?
- In what format can I get it?

- Where do we store it?
- Who can access it?
- Who cleans and validates it?

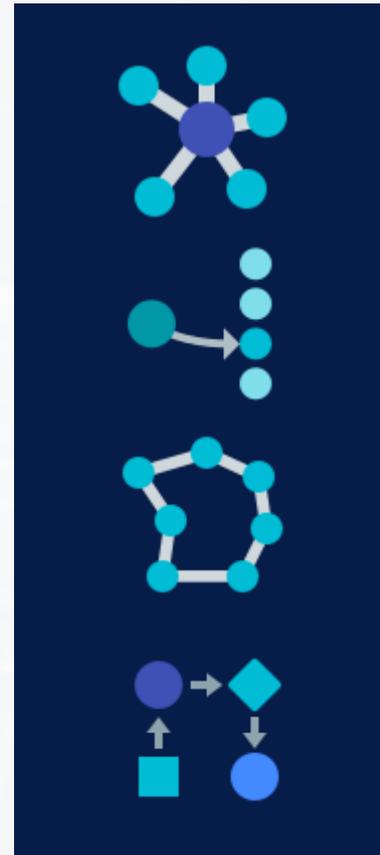
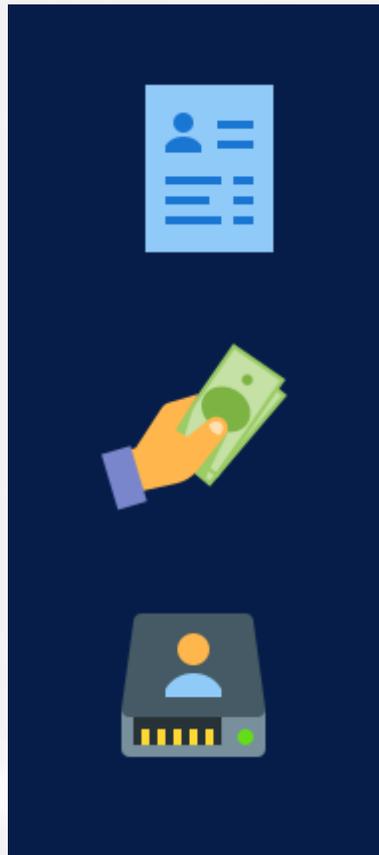
- How do we know if it is valuable?
- How do we extract insights from it?
- What tools can we use for the analysis?

- How do we turn insights into action?
- How do we visualise data and present insights?
- How do we best distribute insights?

# MAS: Some projects in progress



# MAS: Some projects in progress (cont'd)



Identification of suspicious activity



# The journey ahead...

## Transparency

- How to deal with algorithms that are hard to explain?

## Accountability

- Who is responsible for algorithmically-driven outcomes?

## Privacy & Consent

- How to analyse granular data while preserving anonymity?



Above all else  
show the **data**.

Edward Tufte

# Becoming Customer Centric

## Personalised Insurance

Real-time insights  
from devices,  
reimagining the  
underwriting process

Individualization

## Improved Customer Engagement

How can real time on-  
demand data help  
agents have more  
meaningful  
discussions?

Real-time data

## 360-view of Customer

How can customer  
data be consolidated  
for insurer to better  
understand their  
customers?

Infrastructure

## Automated Insurance Claims

Can AI automate  
claims, shortening  
turnaround times, and  
lowering cost of  
overheads?

Operations

As insurance becomes Individualized...

Financial Exclusion?

**FLOODRE**

The ability to accurately model the flood risk of each property requires some thought and management

Using real-time on-demand data...

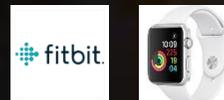
Will underwriting be dependent on digital footprints?

**AVIVA**

Aviva – Ask it Never  
No-Questions Home Insurance

360-view of Customer

Are insurers able to collect good quality 360 data?



Are the indicators captured by wearables truly predictors of health?

Automated Insurance Claims

Is the AI reliable? Explainable?

# IMPACT OF TECH ON INSURANCE

**New entrants  
from Tech  
Companies**

**Increased  
reliance on tech  
service providers**

**Financial  
Supervision in  
the Tech Era**



# SupTech Mission

**Empower** MAS with the latest Artificial Intelligence and Data Analytics capability to **enhance current supervision** and to **address blue sky supervision**.

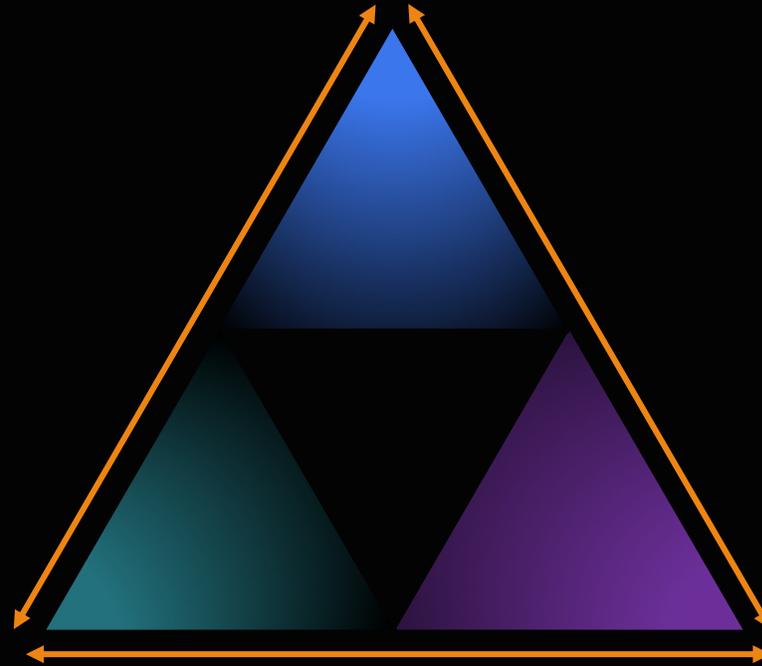
**Share** Suptech knowledge and experience with global regulators, and **collaborate to shape** the technological landscape to support a better global financial supervision.

# COOPERATION

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**MAS**

Fostering collaborations  
Understanding Risks  
Create conducive environment for innovation



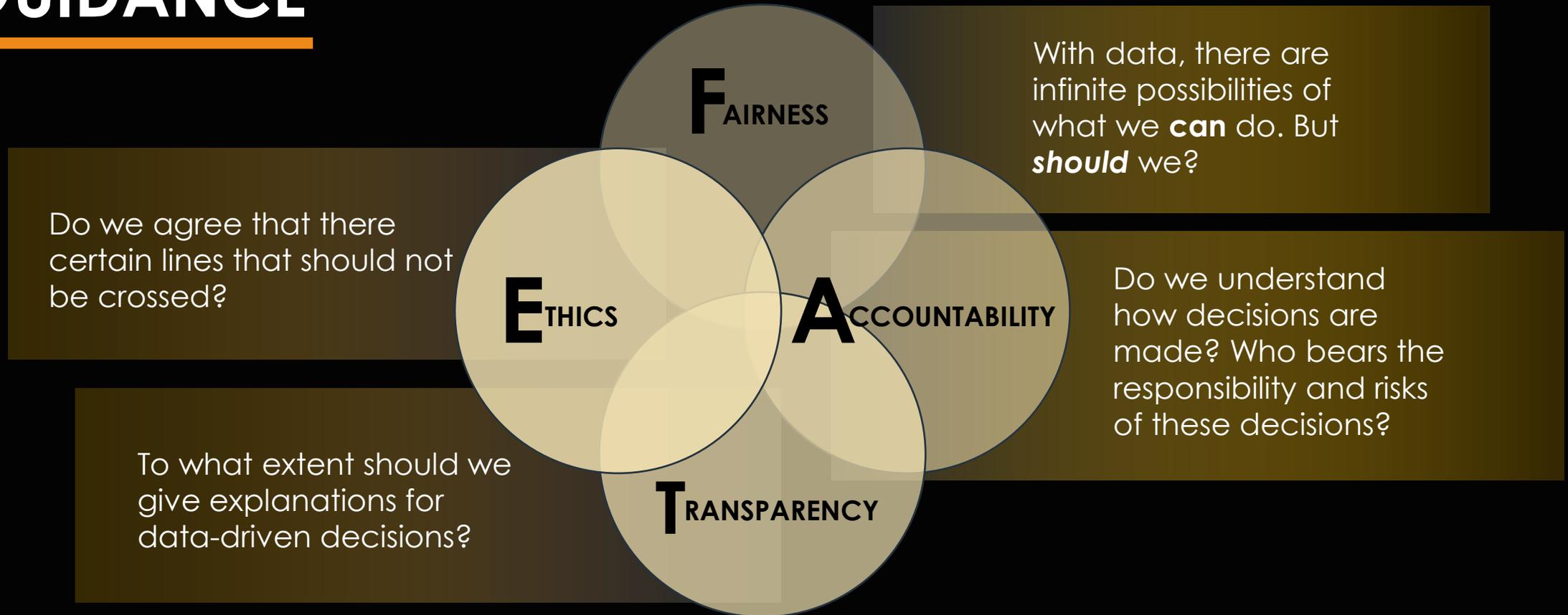
New insurance propositions  
Improvements to Operations  
Improvements to Distribution

**InsurTech**

**Insurers**

Increased use of data  
Innovation, AIDA  
Investment into Tech

# GUIDANCE



## FEAT Guidance

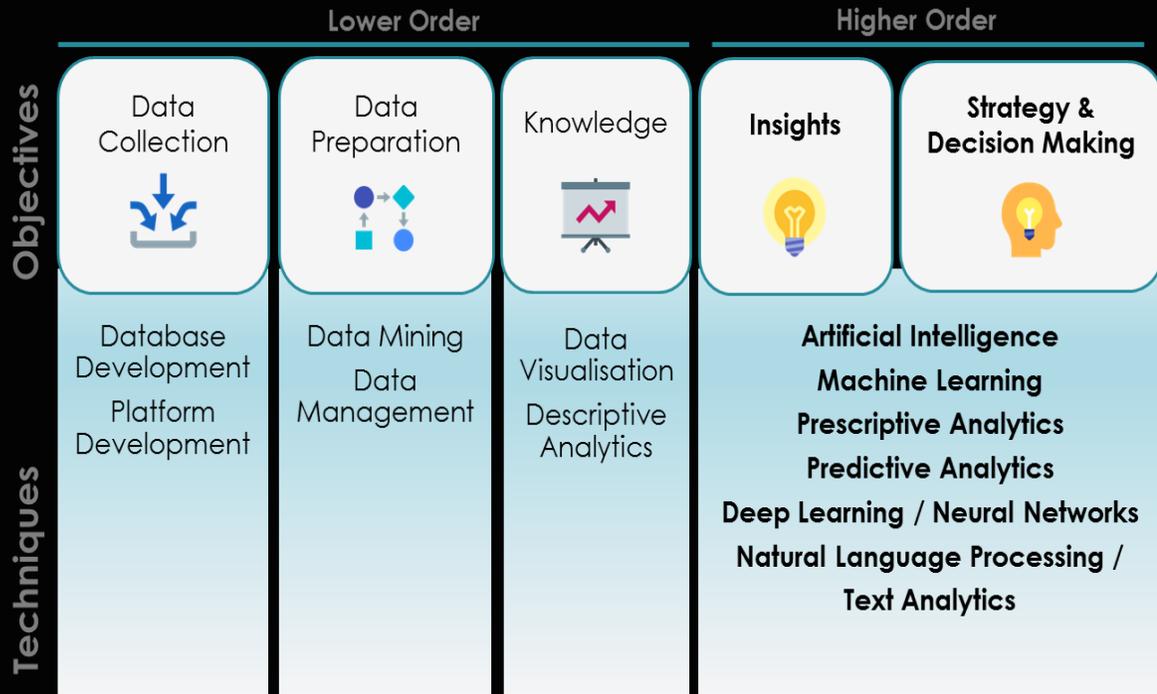
General all-purpose  
Industry-led

## AI Guidance

Regulated Activities  
Industry-led  
Technical

Promote the adoption and integration of AI and DA in FIs

**50% CO-FUNDING,  
UP TO \$\$1M**



- 1) Direct manpower expenses
- 2) Professional services
- 3) Hard/Software
- 4) Equipment and IP

Demonstrate adoption of AI & DA to achieve business objectives

Demonstrate consideration of workforce impact



**MAS SupTech has  
partnered with  
many FIs to do  
pilots on granular  
data**

**Proactive Detection of Financial  
Misconduct**

**Transactions Monitoring & Anti-money  
Laundering**

**Industry-wide Stress-testing**

**Policy Research**

**Automated Compliance Reporting**

# SUPTECH DEVELOPMENTS

## Enhanced In-house Capability



Straight through processing systems



Alerts and Augmented Intelligence



Supported by new Infrastructure



## Dialogues with Insurers

**Encourage Innovation and use of AIDA**

Engage players to understand pain points

Collectively figure out ways that MAS can help, possibly in areas of data sharing

## Facilitate Innovation

**Get industry players to come together, support**

## Pilots

**Automate regulatory reporting, prevent duplication**

**Collection of new data for experimentation, without shaking up the whole industry**

**12**  
**16**  
NOV  
2018

**SINGAPORE**  
**FINTECH**  
**FESTIVAL**

**GLOBAL FINTECH**  
**HACKCELERATOR**  
Industry Problem Statements

**18 INSURTECH PROBLEM STATEMENTS**

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**Thank you!**