Data-Driven Risk & Compliance

Pressure Cooker

2016

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Thanks for joining us…

Data Driven Innovator

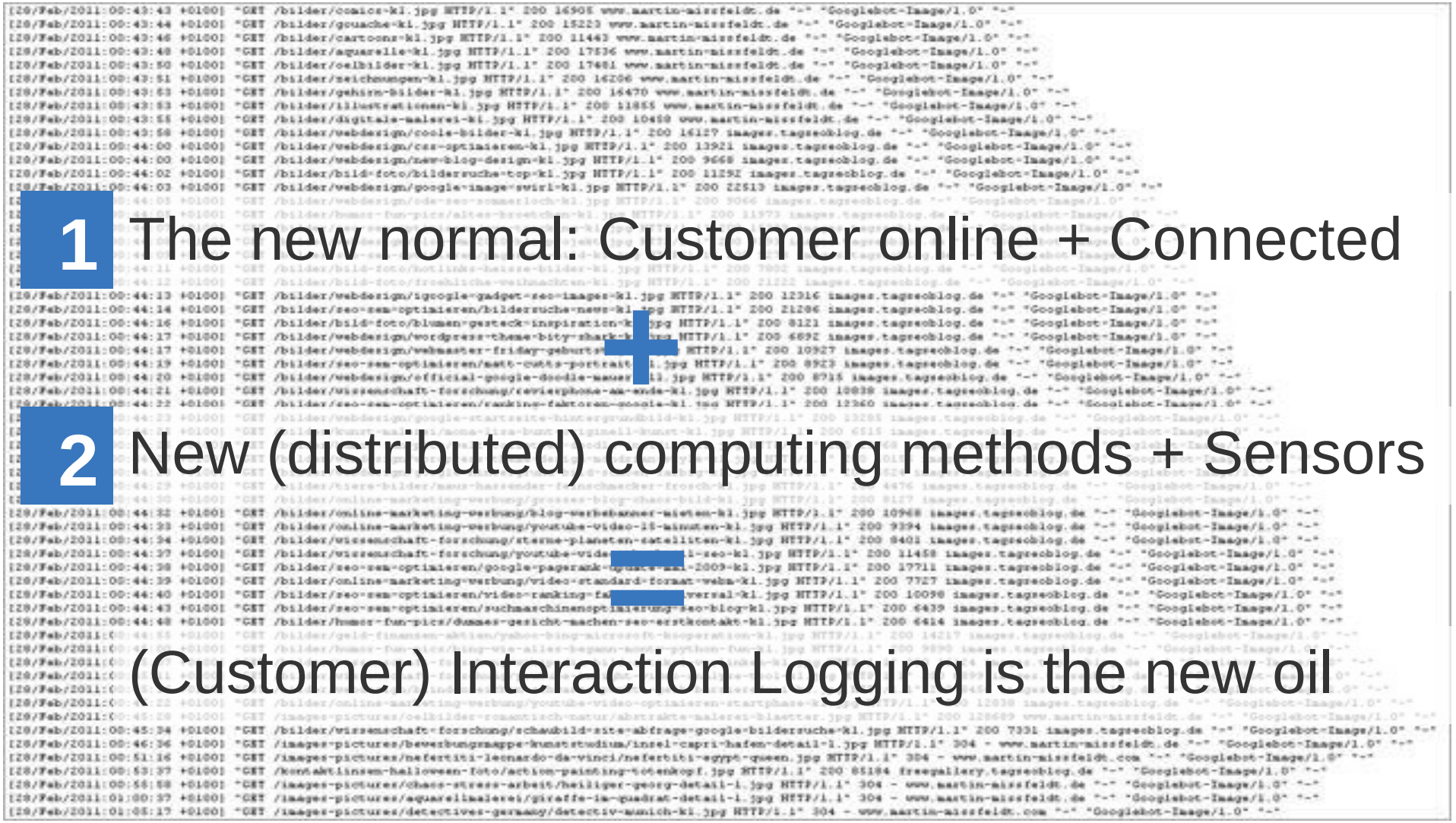
- 18 years Financial Services Industry
- Actuarial background and Solvency
- Leads PA Consulting Group´s Risk & Compliance Team in the Benelux

Data Scientist

- Background in Artificial Intelligence
- Leads PA Consulting Group´s Data Science Team in the Benelux
- Speaks 14 programming languages


WARNING!
AIM OF THIS PRESSURE COOKER:
UNDERSTANDING HOW TO DRIVE
RISK&COMPLIANCE VALUE FROM DATA

This Pressure Cooker is about Entrepreneurship in (Y)Our daily reality…



1 The new normal: Customer online + Connected

2 New (distributed) computing methods + Sensors

(Customer) Interaction Logging is the new oil

Warming-up: What is a killer case?

We have created an approach to accelerate Data Driven Innovations

Rock start is our inspiration. Killer cases are our start-ups

The birth of a killer case

Define
(Portfolio Management)

Deliver
(Insight project delivery)

Deploy
(Benefit realisation)

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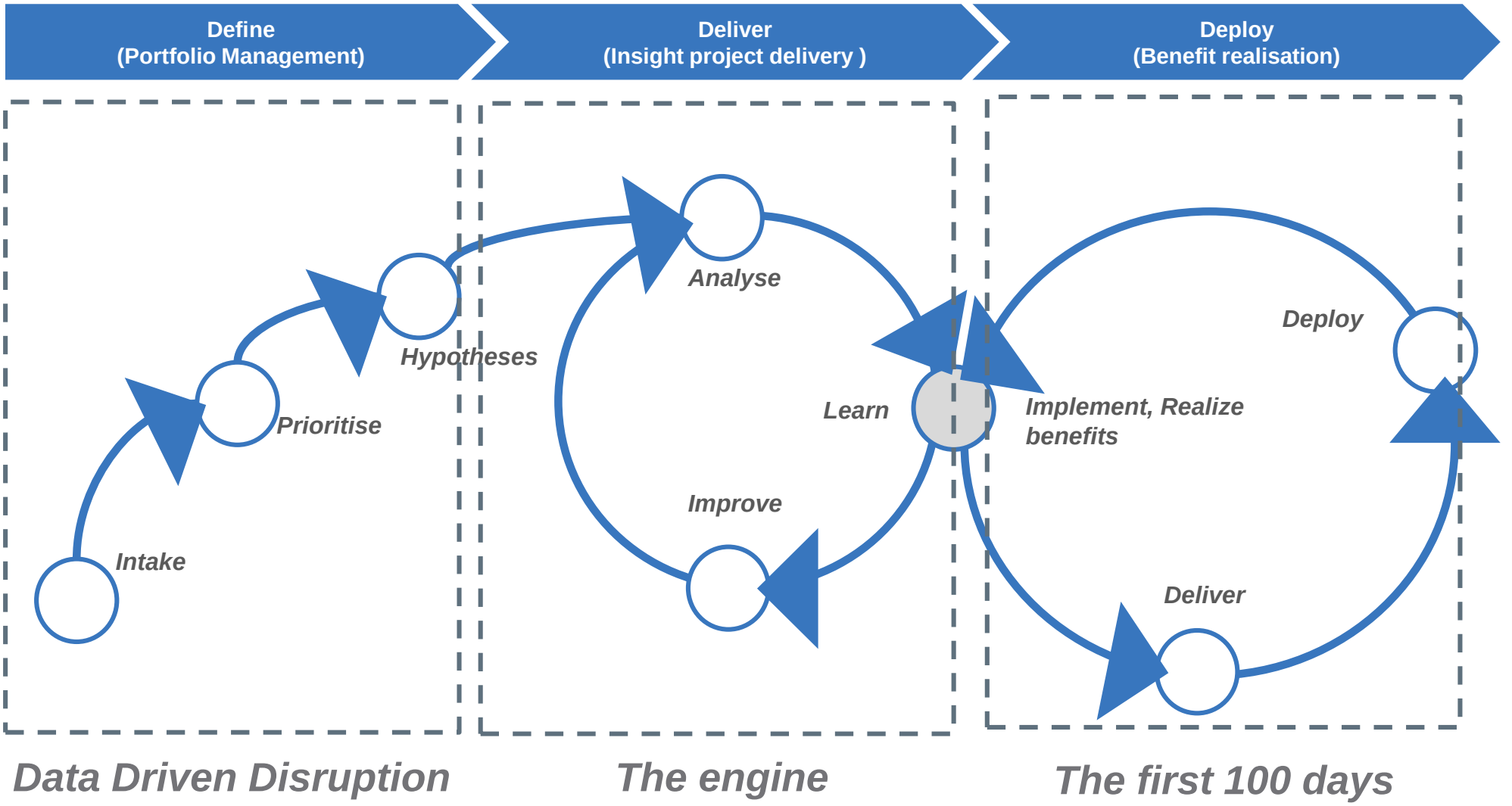
The birth of a killer case, explained in three Pressure Cooker Blocks



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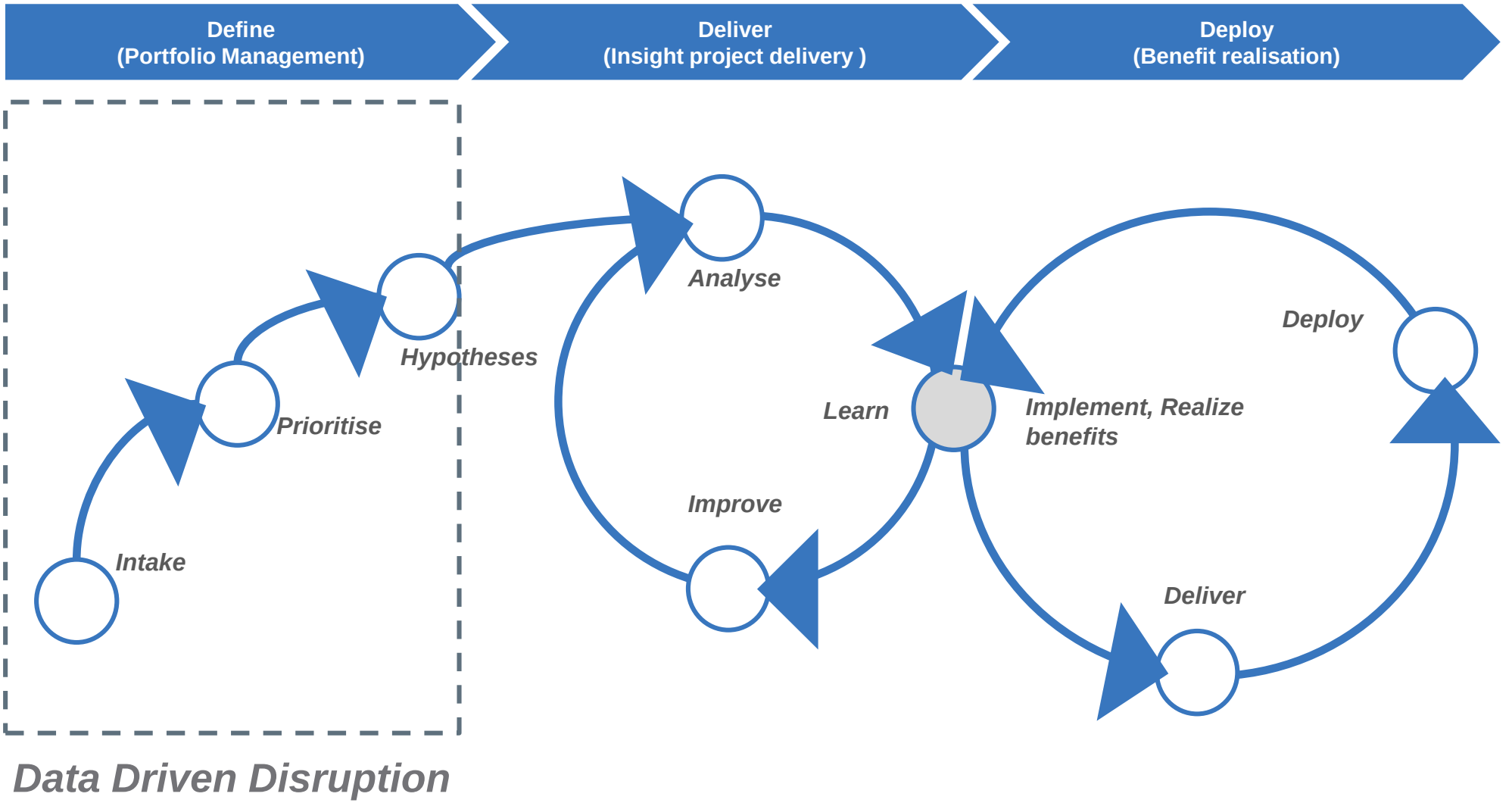

Data as a key driver of Risk & Compliance impact in a Digital World

Many regulatory policies

Few regulatory policies

AML

KYC

GDPR

Solvency II

Zorgplicht

Traditional Risk & Compliance

CHALLENGE!

Sufficient budget and FTE

Pressure on budget and FTE

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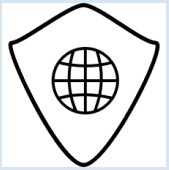


GDPR

Traditional Risk & Compliance

Smart Risk & Compliance

Sufficient budget and FTE

Pressure on budget and FTE

Advanced Data Analytics help large banks to be compliant with Know Your Customer (KYC) regulations and reduce compliance costs.

Situation

- Enhanced Due Diligence regulations
- Verification

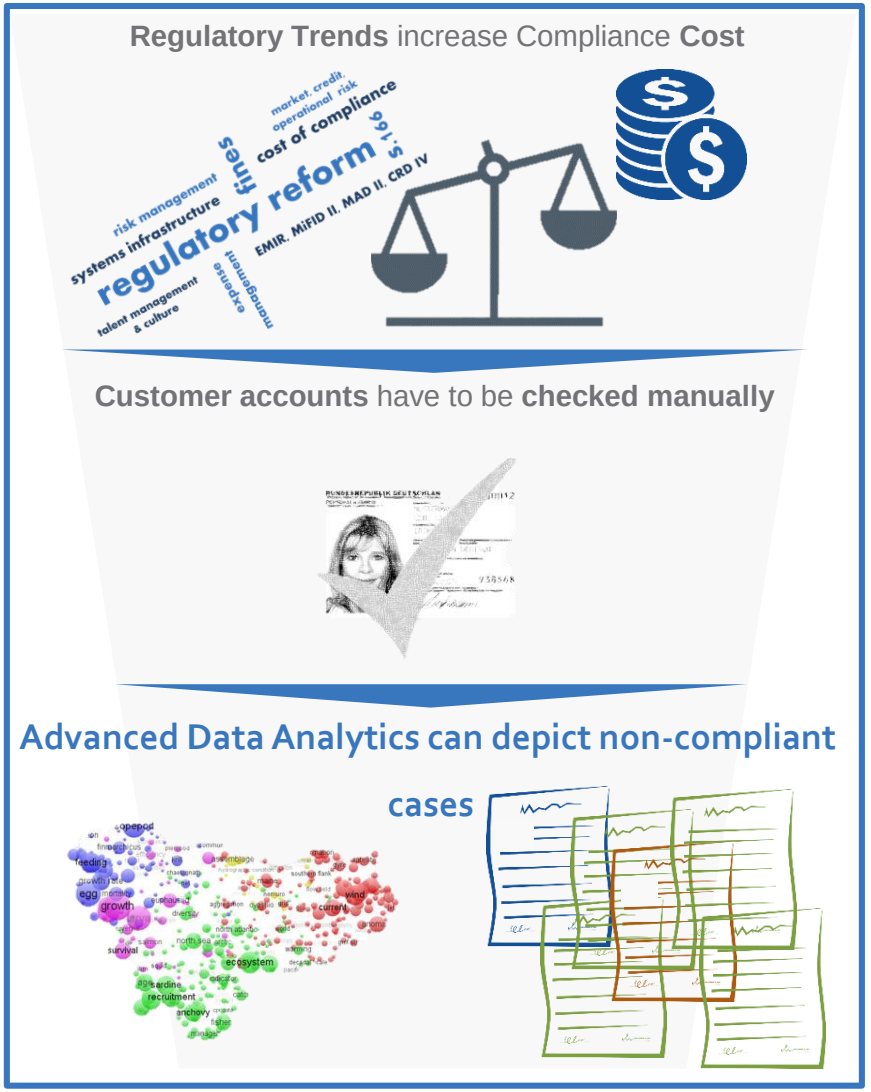
Challenge

- Unstructured files
- Spot checks
- Time-consuming
- Cannot ensure 100% compliancy.

Efficient compliancy while reducing manual labour?

Answer

- Advanced data analytics
- Machine learning, predictive analytics
- Probability



European Data Protection Regulations – enlarged responsibilities for financial institutions concerning Personal Data

Situation

- Data Protection Regulations
- Protection of personal data
- The penalty of 5% of worldwide revenue

Challenge

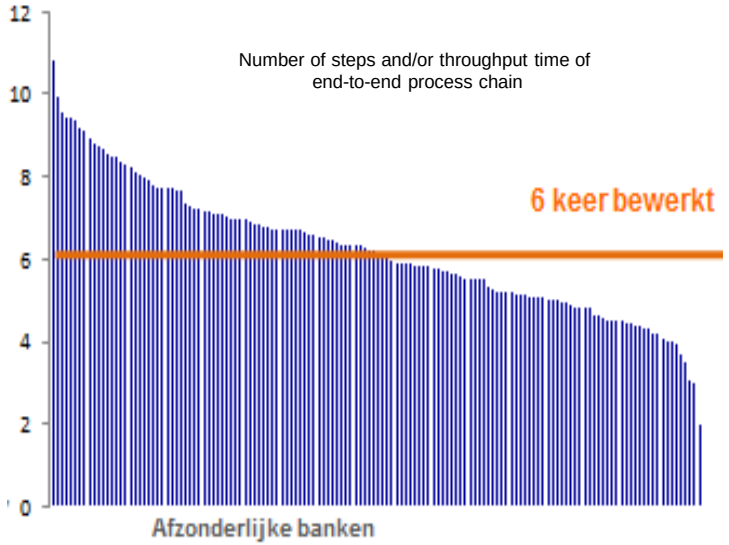
- Contracts are scattered and unstructured
- Time intensive and sampling
- Not continuous

How can numerous files be reviewed in a short period of time to ensure compliancy?

Answer

- Advanced analytics, text mining, natural language processing
- Data driven compliance officers and data scientists
- 6-8 weeks

Bottleneck remover | reduce the process steps and save up to 20% costs



Who is this?

The Palantir of ….

Infrastructure (Palantir products):

- Palantir Gotham: Used to integrate, secure, manage and analyze enterprise data.
- Palantir Metropolis : Used to integrate, analyze, enrich and model any kind of quantitative data

Killer cases (Palantir solutions)

- Anti Fraud
- Capital Markets
- Case Management
- Crisis Response
- Cyber Security
- Defense
- Disaster Preparedness
- Disease Response
- Healthcare Delivery
- Insider Threat
- Insurance Analytics
- Intelligence
- Law Enforcement
- Legal Intelligence
- Palantir Verus
- Pharma R&D
- Trader Oversight
- Custom Solutions

…. Banking (Killer cases)

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…. Your business

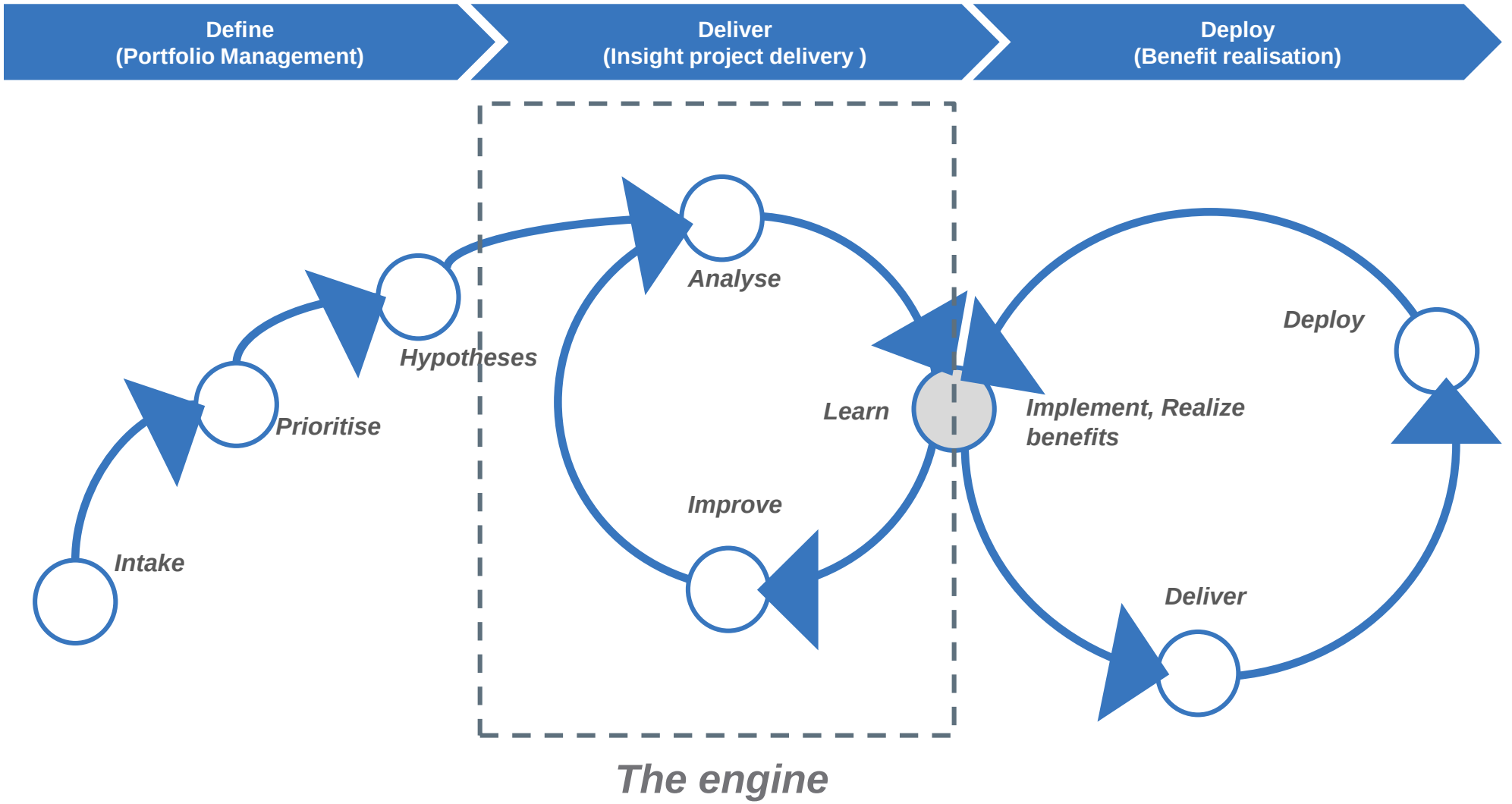
Pressure Cooker Workshop:
Idea generator

- We split in groups

- Brainstorm potential killer cases for Risk & Compliance
  1. Where do we see **risk of mal-compliance**? Which regulations? What makes it difficult?
  2. Where do we see **efficiency potential**? Which processes? What makes it difficult?
  3. How can we make more **impact**? Early warning indicators, prioritization?

- Pitch your top-3 ideas to the group

The birth of a killer case, explained in three Pressure Cooker Blocks

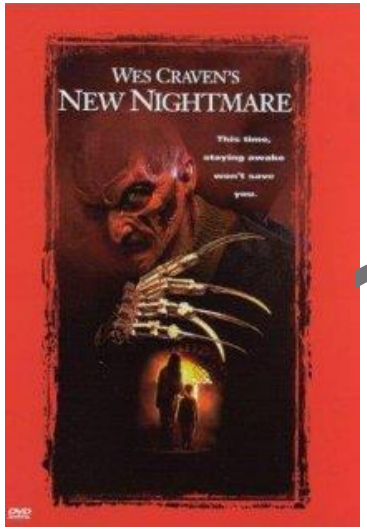


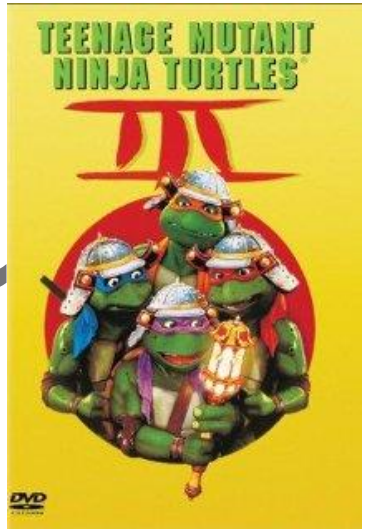
Methods developed in the 70s can now be applied to large data sets

- Pearson Correlation Coefficient

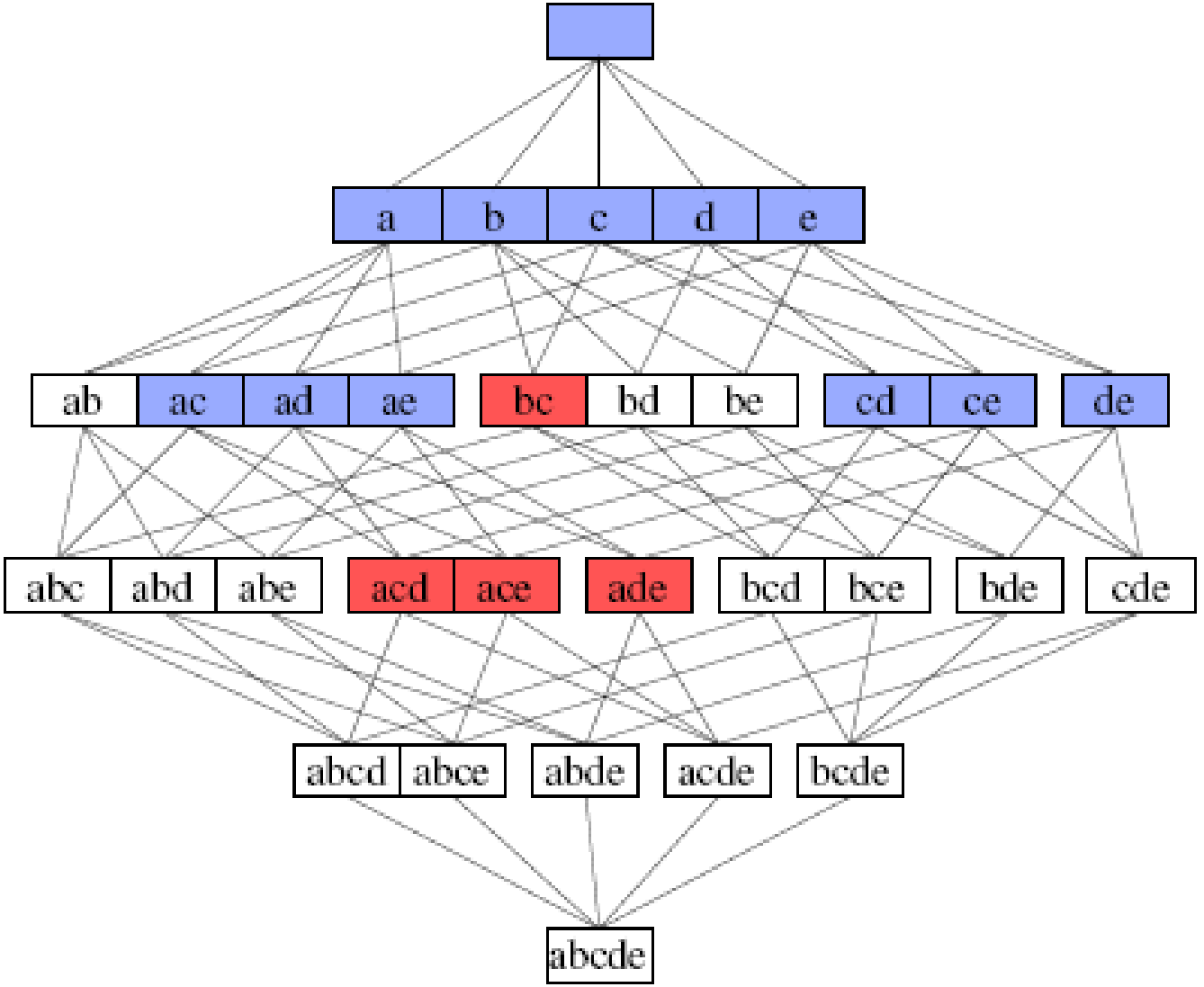
$$r = r_{xy} = \frac{n\sum x_i y_i - \sum x_i \sum y_i}{\sqrt{n\sum x_i^2 - (\sum x_i)^2}\ \sqrt{n\sum y_i^2 - (\sum y_i)^2}}.$$

- Example: which movies are scored high together?





Amazon uses Frequent Item Sets to analyze “shopping baskets”

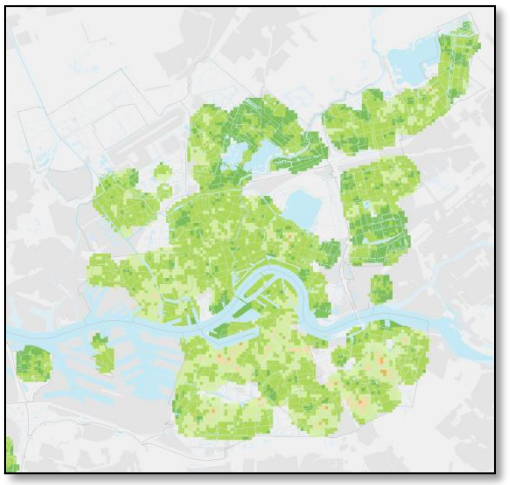


Municipality of Rotterdam use Decision Trees to spot potential fraud

```
huwdat > 20 Nov 1999: FALSE (2416/240.5)
huwdat <= 20 Nov 1999:
:...C.leeftijd > 84: TRUE (171.1/29.9)
    C.leeftijd <= 84:
    :...MIN_BWJR_PND <= 1968:
        :...MIN_BWJR_PND > 1924: FALSE (1475.4/308.5)
        :   MIN_BWJR_PND <= 1924:
        :   :...C.leeftijd <= 55: TRUE (595.5/271.7)
        :       C.leeftijd > 55: FALSE (367.2/84.1)
        MIN_BWJR_PND > 1968:
        :...buurt in {1 … 98}: FALSE (972.9/311.5)
            buurt in {12 … 99}:
            :...BELBVEILIG2013 <= 1.8277: TRUE (1078.9/375.5)
                BELBVEILIG2013 > 1.8277: FALSE (293/120.1)
```

1

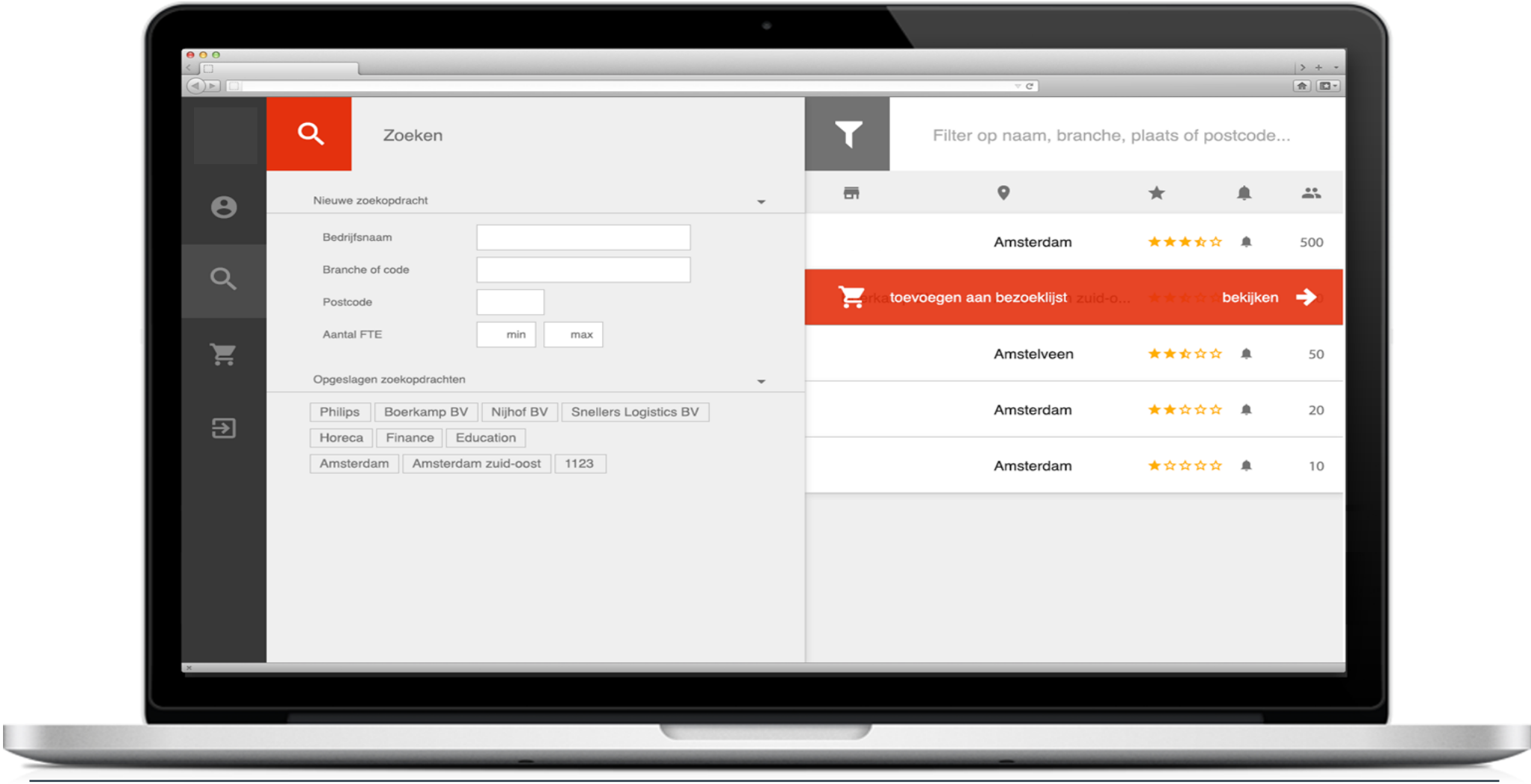
2



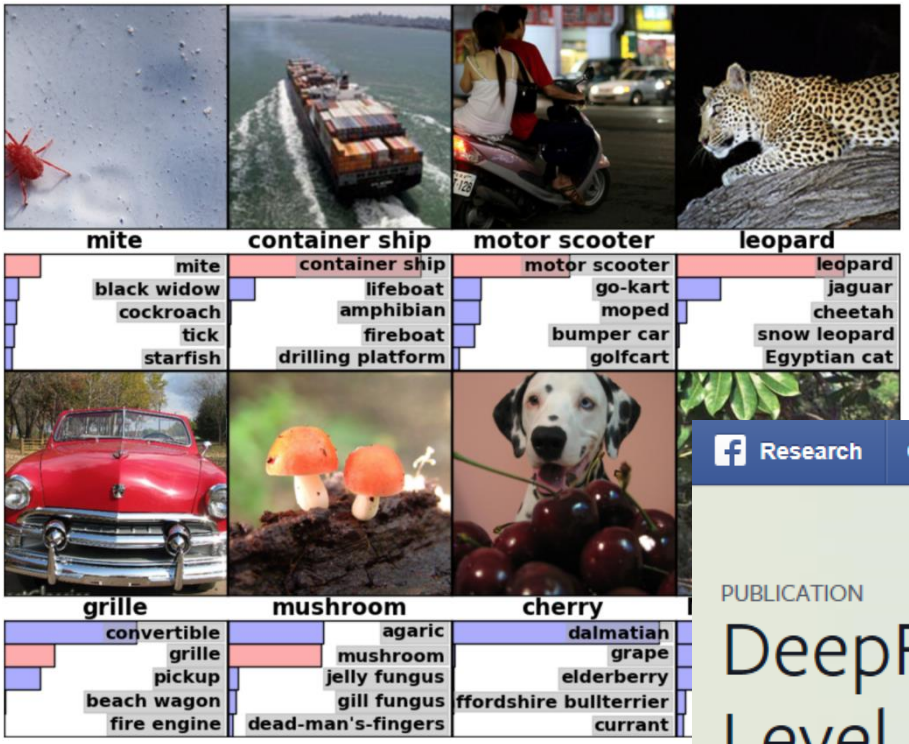
Determining factors for “married, not living at the same address” appear to be:

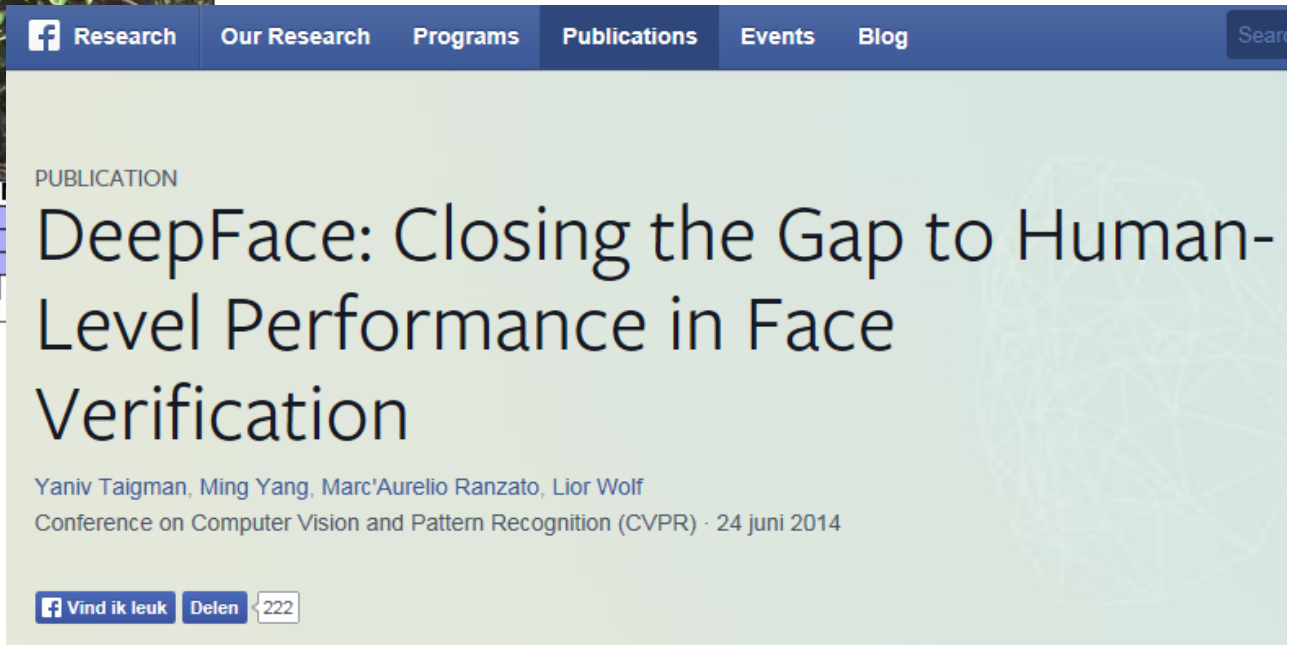
1. Age and age of the home
2. The sense of safety in the local neighborhood

A Temp Agency uses Random Forrest to spot propensity to buy



University of Munich use Deep Learning to classify random images to support patients with disabilities – Facebook is researching DeepFace





Over the last seven years, the way of data analytics has fundamentally changed

How we used to do it	How we are now doing it
Closed Source	Open Source
Scale Up	Scale Out
Schema on W	ema on Read
Bring Data to	s to the Data
Bring expert k	rom the data
Statistics	Machine Learning
Innovation led by corporations	Innovation led by the crowd
Build to last	Build what is required NOW

"Hadoop was built in the Google distributed file system (2003) and a Google paper on Map-Reduce (2004)"

This is how Netflix can predict the titles that are most likely to be of interest to you

Scores per title of individual users

	A	B	C	D	E	F	G
user 101	3	2	4		3	4	3
user 102		3		3	3		5
user 103	3	5			3		
user 104	4	3	5	5	1		4
user 105	5		2		5		3
user 106	1	4		3	5	5	3
user 107	3	3	5	5	2	4	
user 108			2			3	3
user 109	3	5		3		4	2
user 110			3	3			
user 111	4		1	5		2	3
user 112	3		5	1			
user 113		2		5		5	3
user 114	5	4			4		
user 115	2					4	3
user 116	4		3		3	3	3
user 117	5			4		3	5
user 118		5	4	1	5		
user 119	3	3			1	5	
user 120		5					

Correlations between the scores of individual titles

	A	B	C	D	E	F	G
A	1.0	-0.1	-0.3	0.5	-0.2	-0.3	0.6
B	-0.1	1.0	-0.3	-0.3	0.6	-0.3	-0.1
C	-0.3	-0.3	1.0	-0.3	-0.3	0.7	-0.2
D	0.5	-0.3	-0.3	1.0	-0.3	-0.3	0.6
E	-0.2	0.6	-0.3	-0.3	1.0	-0.4	-0.2
F	-0.3	-0.3	0.7	-0.3	-0.4	1.0	-0.1
G	0.6	-0.1	-0.2	0.6	-0.2	-0.1	1.0

Scores of title F are strongly correlated with those of title C

User 104 will therefore probably like title F

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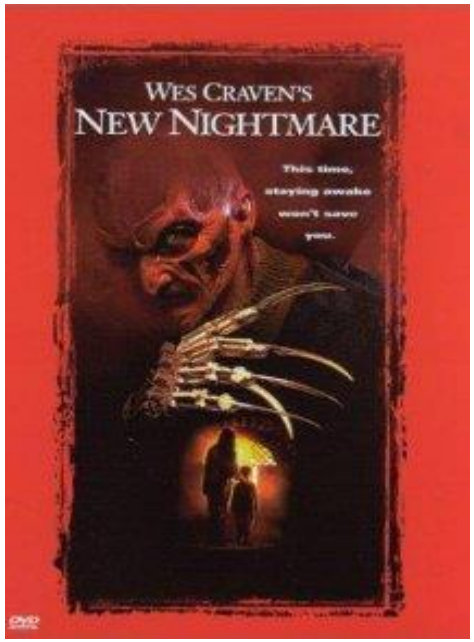
$$r = r_{xy} = \frac{n\sum x_i y_i - \sum x_i \sum y_i}{\sqrt{n\sum x_i^2 - (\sum x_i)^2}\,\sqrt{n\sum y_i^2 - (\sum y_i)^2}}.$$



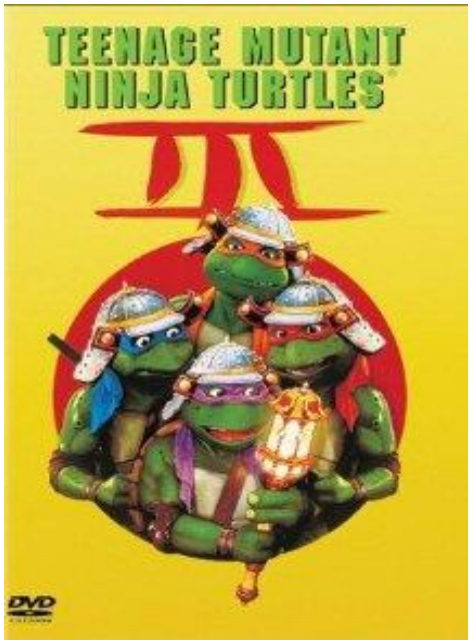
A demonic force has chosen Freddy Krueger as its portal to the real world. Can Heather play the part of Nancy one last time and trap the evil trying to enter our world?

Chucky, the doll possessed by a serial killer, returns for revenge against Andy, the young boy that defeated him and has since become adult.

30

$$r = r_{xy} = \frac{n\sum x_i y_i - \sum x_i \sum y_i}{\sqrt{n\sum x_i^2 - (\sum x_i)^2}\,\sqrt{n\sum y_i^2 - (\sum y_i)^2}}.$$

When a bird "flies" into a chicken farm, the fellow chickens see him as an opportunity to escape their evil owners.



The turtles find themselves transported back in time to ancient Japan.

31

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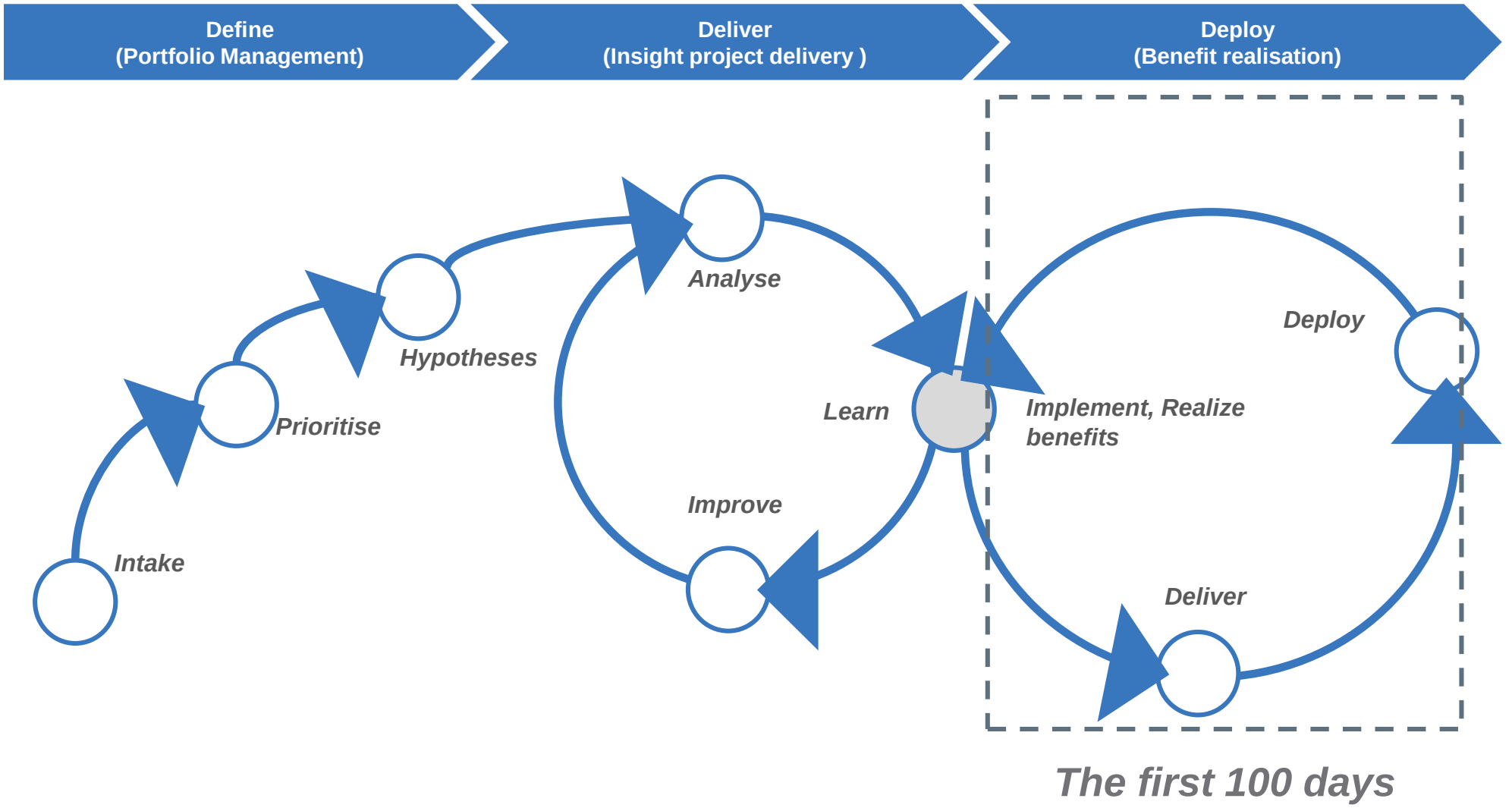


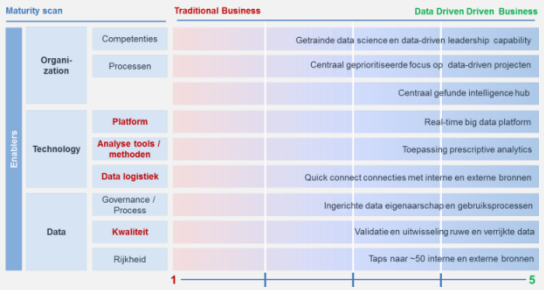
Did we meet your expectations? What are your take aways?

How we help to accelerate Data Driven Innovation…

Define (Portfolio Management) | **Deliver (Insight project delivery)** | **Deploy (Benefit realisation)**

1 Data Driven Innovation Inspiration session

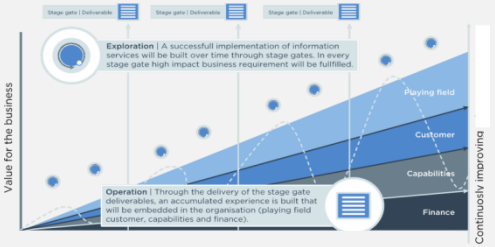
2 Data-Driven Transformation maturity scan



3 Killer case projects

4 Sandbox platform

5 Digital transformation support



6 Data-driven transformation serious game