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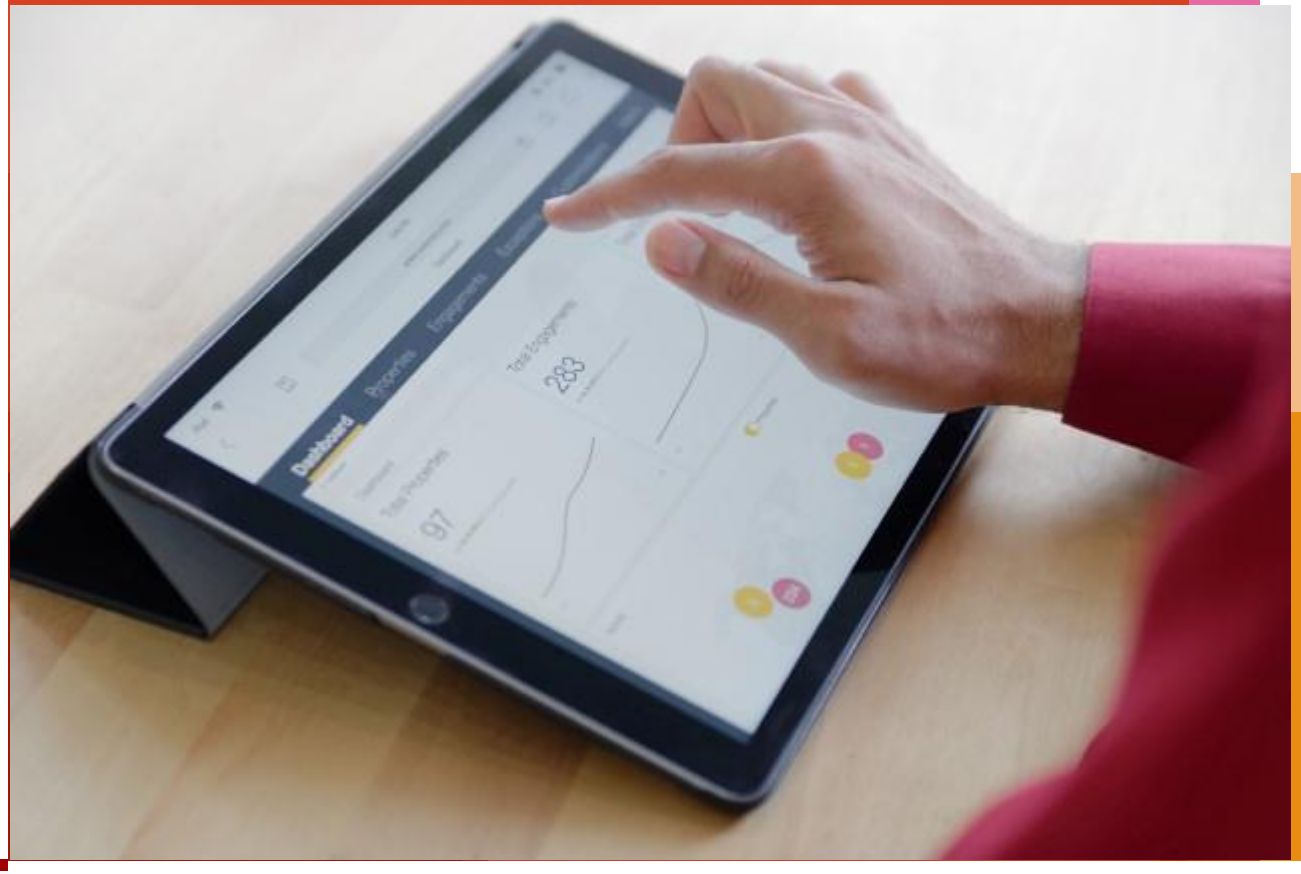
Analytics: moving up the value chain



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Introduction

Carys Davies

Background

External audit experience

Fully Qualified Chartered Accountant (ACA)

Previously worked at the Office for National Statistics

Worked in the Finance team at a Fintech start-up

What do I do?

Finance transformation projects

System selection & implementation

Data visualisations and BI modernisation

BI maturity analysis

Predictive analytics

The Digital Revolution

The data explosion

x 2 — The amount of data in the digital universe is doubling every two years.[1]

85% — 85% of this data is coming from new data sources.

50 — The enterprise's data volume will grow 50 times each year between 2014 and 2020.[2]

Key drivers

Social media

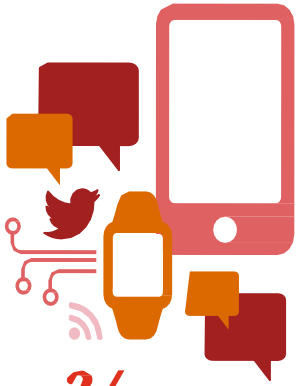
500 million tweets are sent every day. 100 hours of video are uploaded to YouTube every minute.

Connected

The Internet of Things (IoT) will include **26 billion** units by 2020.[3]

Mobile

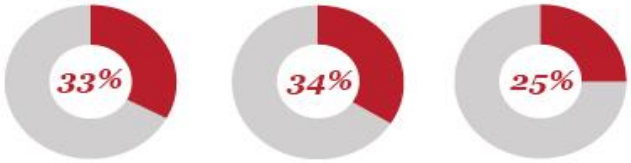
The percentage of mobile things in the IoT will be over **75%** by 2020.[4]



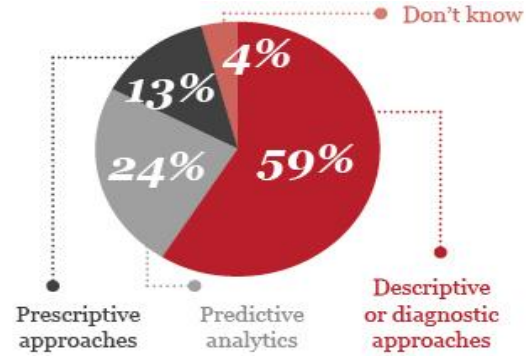
2/3

Two-thirds of the IoT will be other kinds of things, such as sensors, actuators and newly invented intelligent devices that monitor, control, analyse and optimise our world.[5]

When making their next big decision, executives told us they will rely on:

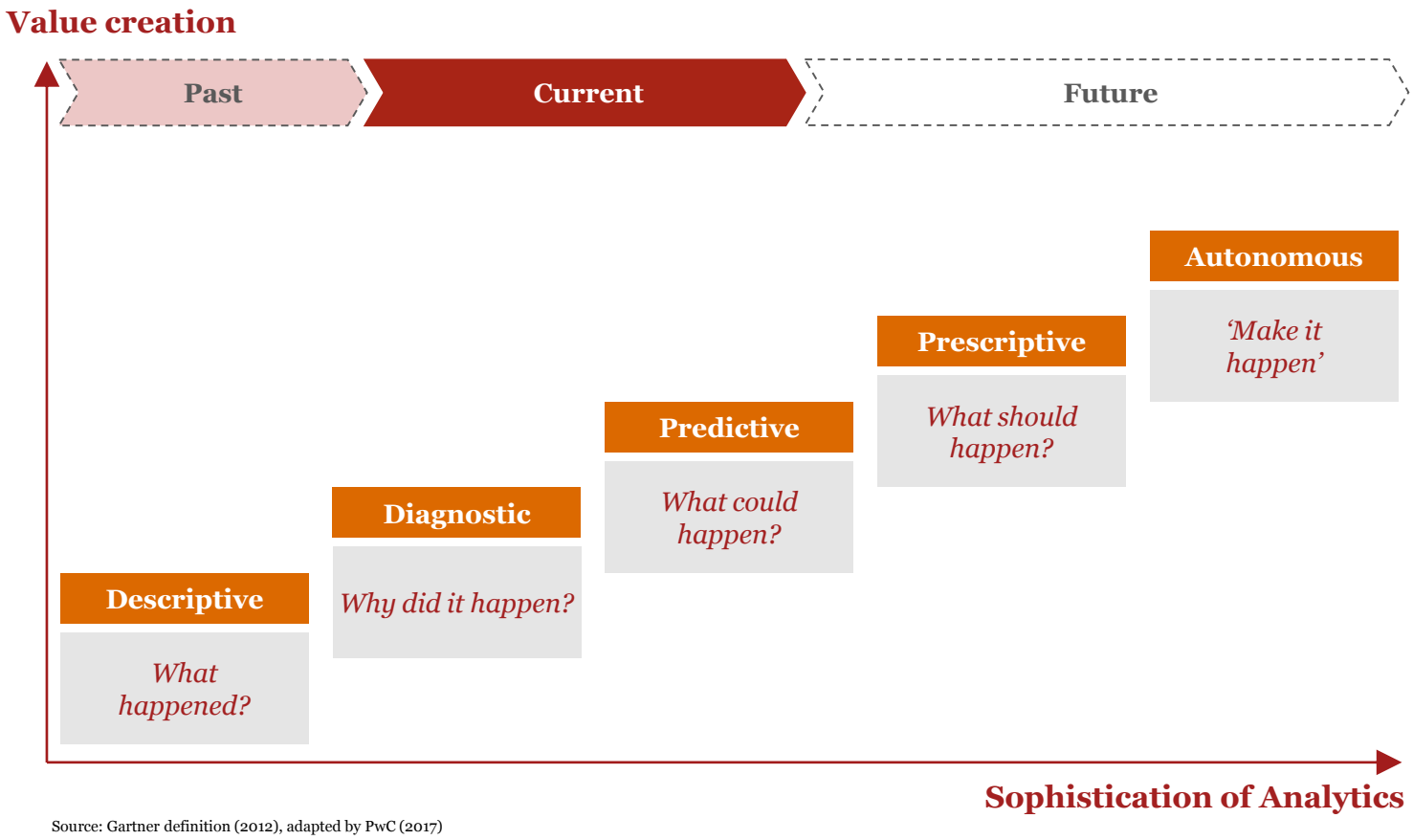


And where data is being used, the UK is not taking full advantage of analytics:



1 International Data Corporation (IDC) | 2 Hadoop Summit 2014 | 3 Gartner | 4 International Data Corporation (IDC) | 5 Strategy& |

This has led to an increase in the sophistication of analytics…



Source: Gartner definition (2012), adapted by PwC (2017)

BI
Descriptive Analytics

1

What is Business Intelligence?

Driving the most business value out of the information at hand

What really matters is working out the best way to leverage the information opportunities, and putting in place appropriate technology and processes to meet that business need.

Business Intelligence can include;

Data Driven Decision Making

*The approach to business which **values decisions** backed up by **data which can be verified***

Culture of Collaboration

*Where shared information becomes **shared intelligence** through communication and discussion*

Insight, instead of Hindsight

*A move away from classic reporting to a more **real time understanding** of where the business is at today*

Data visualisation

Data collected by organisations is growing at an exponential rate, and advances in technology continue to transform how businesses operate and compete.

Insight

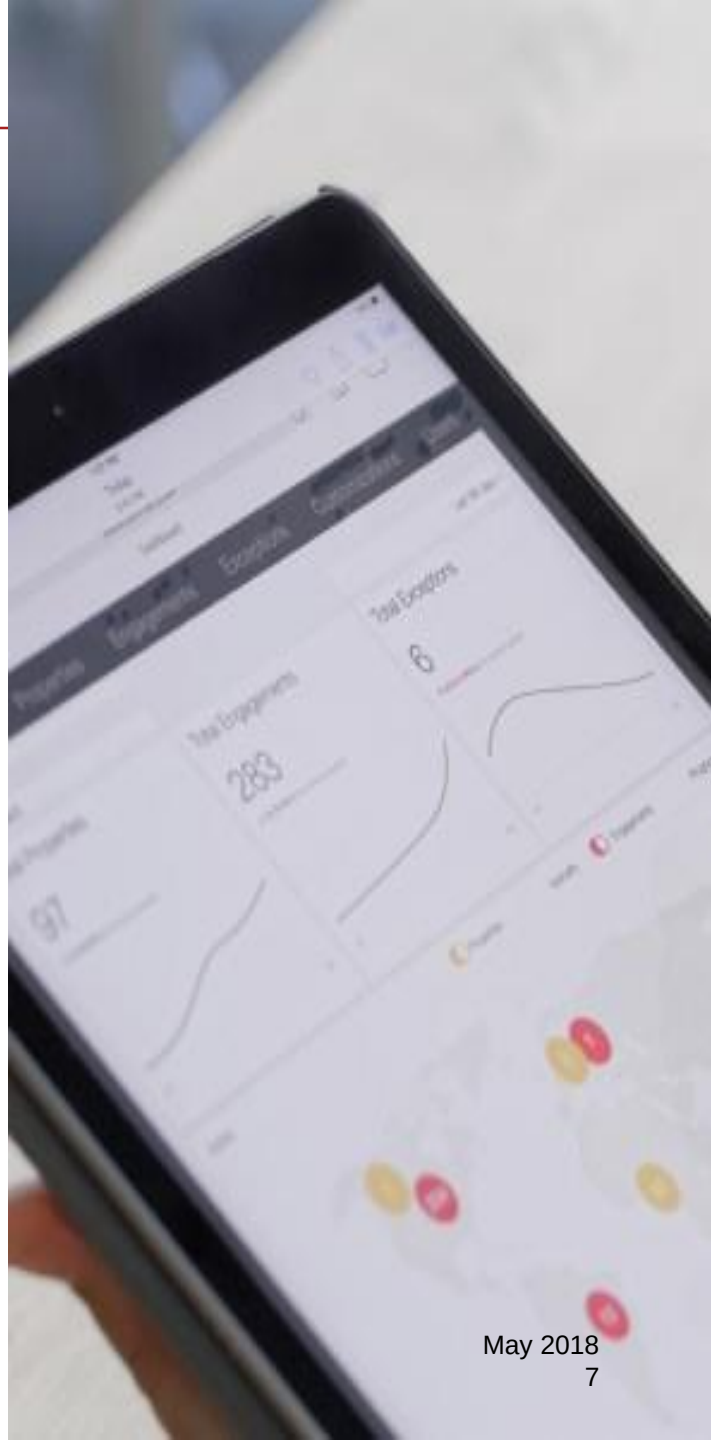
Many businesses are beginning to use data and analytics in their operations to gain valuable insight as to what has happened and why, and to increase the efficiency and accuracy of their operations.

Up to date information

Data visualisation technology is a great way to increase the visibility and understanding of your data and is a first step to becoming more automated and real time in the way in which you manage your business.

Self serve analytics

These technologies act as a window into your data and can be used for 'on the fly' analysis, giving greater insight and flexibility than static Excel reports.



Case study - Modernisation of MI for a North based Logistics firm

We worked with a private business in the north of England to modernise their MI environment.

Obstacle

Historically the firm used manual processes to gather data from the source systems and then constructed MI in Excel. This was a timely process, prone to errors and wasn't repeatable moreover senior management had no confidence in that the data was accurate or up to date therefore were reluctant to make decisions based up on the data presented.

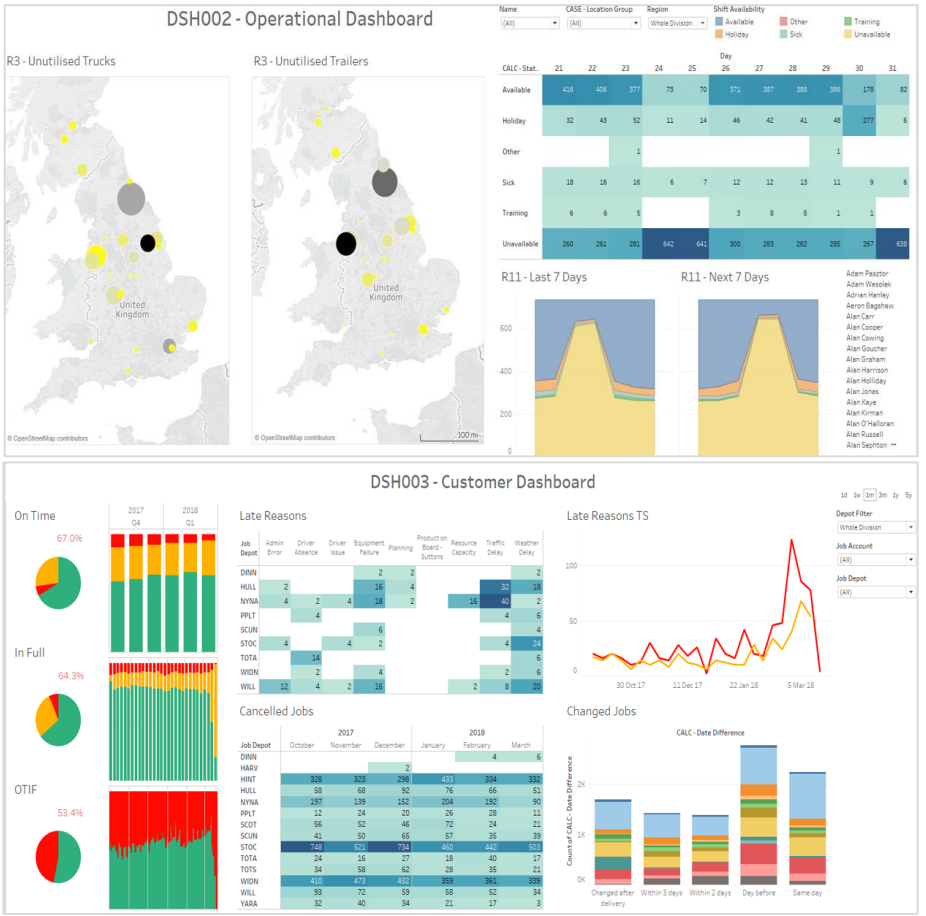
Action

PwC worked with the firm to modernise their estate. To deliver this we:

- Created a data mart to hold all the source data away from the core system, the data layer is an accurate, up to date representation of the source data.
- Constructed a series of dashboards and visualisations for senior management to use in their weekly operations, sales, revenue and customer reports.

Results

The client is now able to take action based upon the visualisations using timely and trusted data.



2

Process and controls discovery
Diagnostic Analytics

Using data analytics to optimise your business processes and controls

Why is it important?

- Processes are becoming much more complex
- There is significantly more data underpinning processes
- Several systems and people interact with processes

As a result it's difficult to understand how processes actually operate. What actually happens isn't always what's documented in procedure manuals or what management think.

Knowledge about the flow of the business processes is key when undertaking initiatives concerning:

Case study – Process and controls analysis

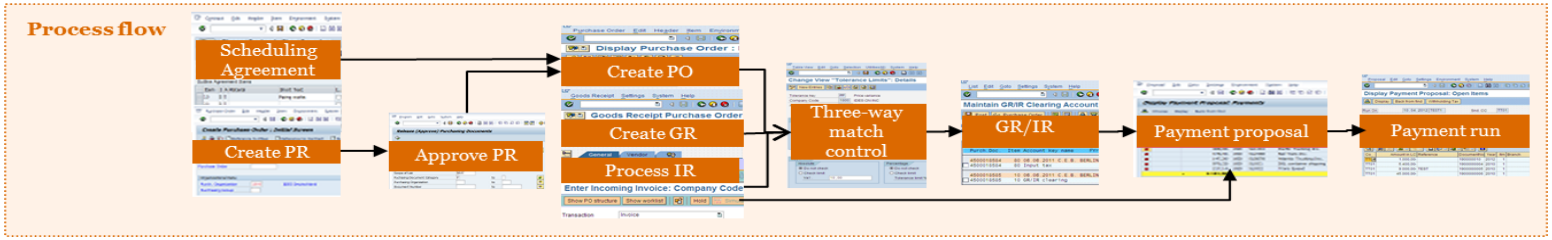
Obstacle

A North based manufacturing client recently purchased an analytics tool and wanted support to build data analytics around internal process to inform their internal audit procedures and critically evaluate key financial controls in place across three processes;

- Purchase to payables
- Payroll
- Employee expenses

Action

PwC built a suite of data analytics to test the below control risks in each of the above areas.



Sub Process	Risk
Vendor master data	- There is a lack of control over the vendor master file for new entries, amendments, and/or deletions. - Incomplete master data can result in duplicate master data creation and potentially duplicate and inaccurate processing of transactions.
PO creation	- Failure to use the PO process can result in: unapproved purchases. - Processing services and expense items without PO can result in duplicate entry and fraud. - Purchase orders are used to make "manual purchases" outside of the accounting system.
Invoice processing	- Unmatched invoices could be paid at the invoice price rather than the negotiated price. Could also lead to potential duplication of invoices as they are posted at both the general ledger and sub ledger levels.

Results

- Ability to test key controls on an ongoing basis to assess whether they are operating effectively and to flag areas and/or report transactions which appear to circumvent controls.

What if your processes aren't clearly defined?

What if the process is not well understood in the first place, so defining KPIs is difficult? There are tools are available to use data to get a holistic view of the whole process e.g. Perceptive.

Using data to discover a number of ***advantages over traditional approaches***:

- ✓ It is based on objective information
- ✓ It is based on the complete data set describing 100% of employee actions
- ✓ It allows you to have many views of the process
- ✓ The results are obtained quickly
- ✓ The analysis can go deep into details as far the data is available

How long does each stage in the process take?

How many variations are there in the process?

To what extent is the process aligned to our expectation?

Are business rules being complied with?

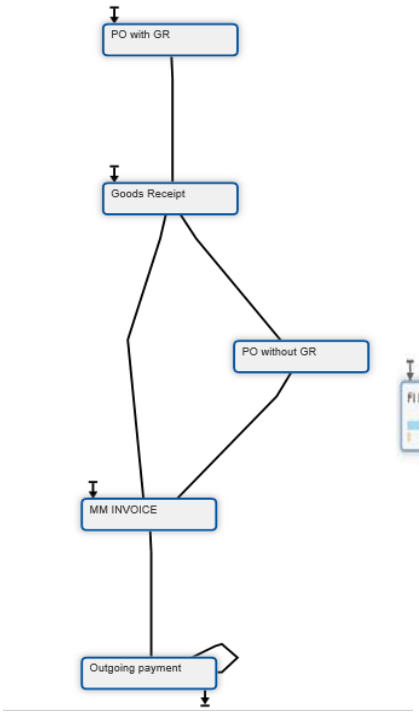
Is there any waiting time between stages?

Are there any re-work loops in the process?

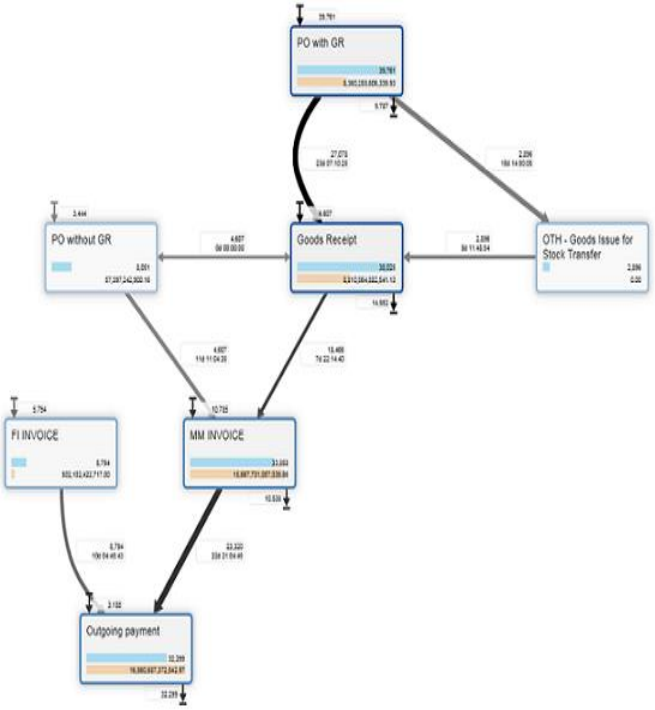
Are controls operating effectively?

Expectation vs reality

Expectation



Reality



Why are these so different?

Processes are complex

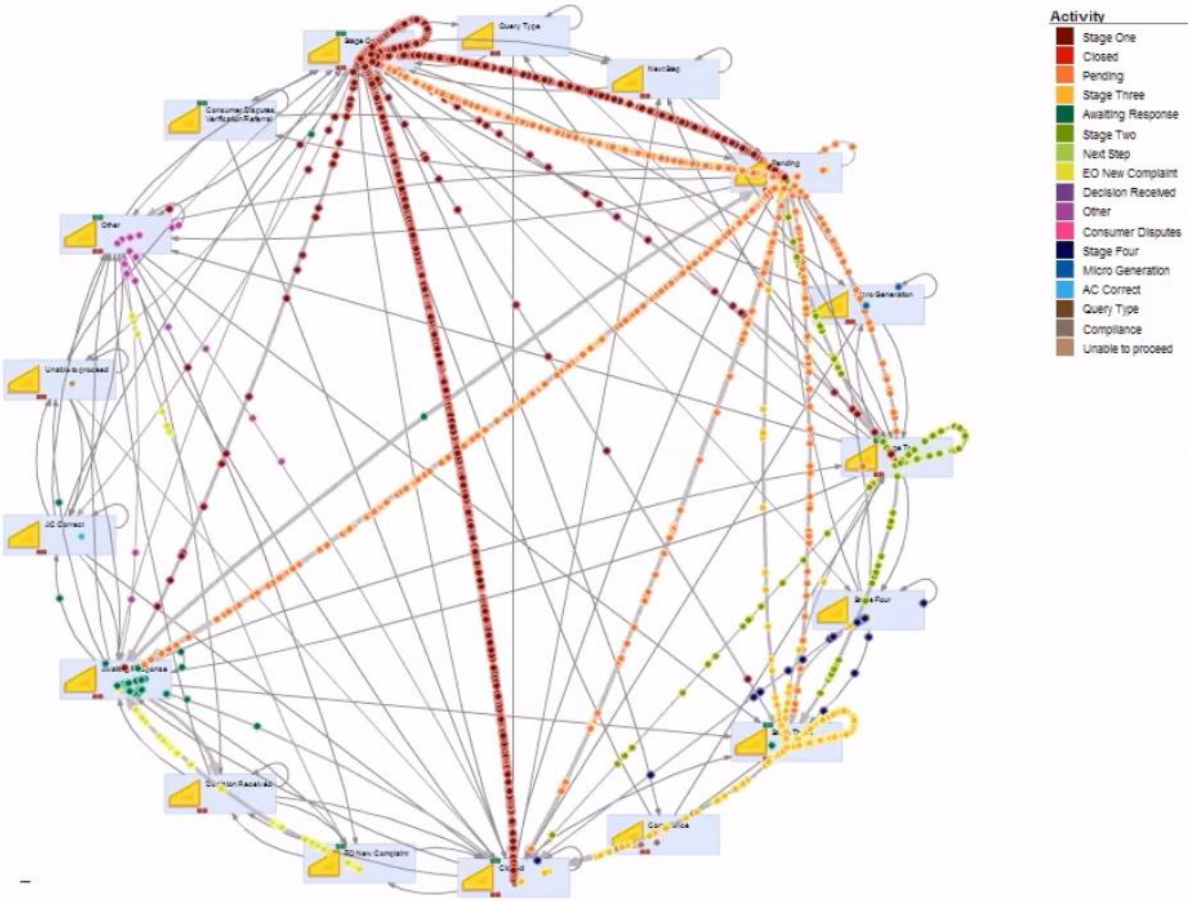
Processes change

Exceptions to the norm

User freedom

Everyone sees only part of the process

Case study – Customer complaints



Predictive Analytics

3

Predictive analytics – Proactive rather than reactive

Predictive analytics can be used to support many business processes. Whether it's supporting driving customer advocacy and retention, optimising your stock holding or improving your resourcing profile to ensure staff are correctly utilised, predictive analytics can help.

Customer retention

You're able to predict which customers are at the risk of leaving your organisation and optimise your retention efforts on those who will actually leave and are profitable.

Stock management

All parties of the supply chain hold the optimum inventory meaning a reduction in out of stock and overstock situations.

Credit control

You can predict which customers may default before the actually do meaning you can minimize your risk and exposure.

Future sales

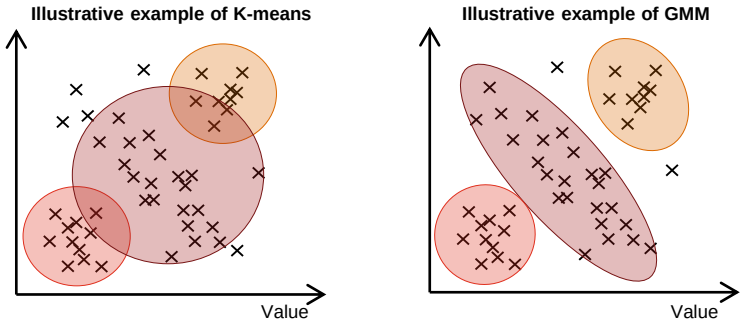
You can predict which customers may buy your product, which are unlikely to and what price you should be setting according to future market demand.

Predictive modelling approach

Historical data

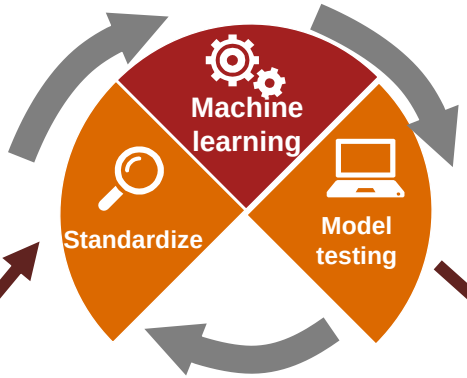
Extract, cleanse and transform historical data, from internal systems, to create a data set to be used in the segmentation and predictive model.

Clustering Analysis



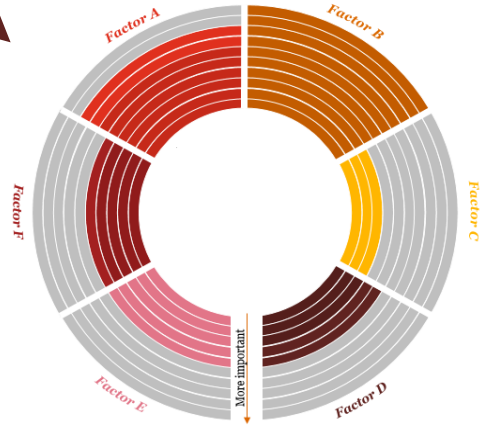
Using machine learning, **a variety of different segmentations are run** (varying features, number of segments and clustering technique) to produce the optimal segmentation.

Predictive models



Using machine learning, **various different models are ran** (varying customer features, historical data, segment and predictive model used) to identify the models that best explains the use case.

Final output



A model that can identify the **key features** behind the defined outcome e.g. default on payments.

How does it differ to traditional approaches?

Traditional approaches commonly use human judgement to create simple rules to group customers together. These segments are often overly simplistic, can introduce bias and miss out on distinct customer segments.

Case study– North housing association

Obstacle

Our client was concerned about the implications of Universal Credit on their customer's ability to budget and pay for their rental obligations to the Housing Association they rented their property from.

Challenges faced by the client

- Lack of understanding of their customers
- A blanket approach to dealing with rent arrears
- Little use of their data to inform their processes

How advanced analytics helped

We delivered a 'proof of concept' of predictive analytics in the rent process, including;

- Insightful customer segmentations
- Data quality analysis and recommendations
- Modelling of 'at risk' customers

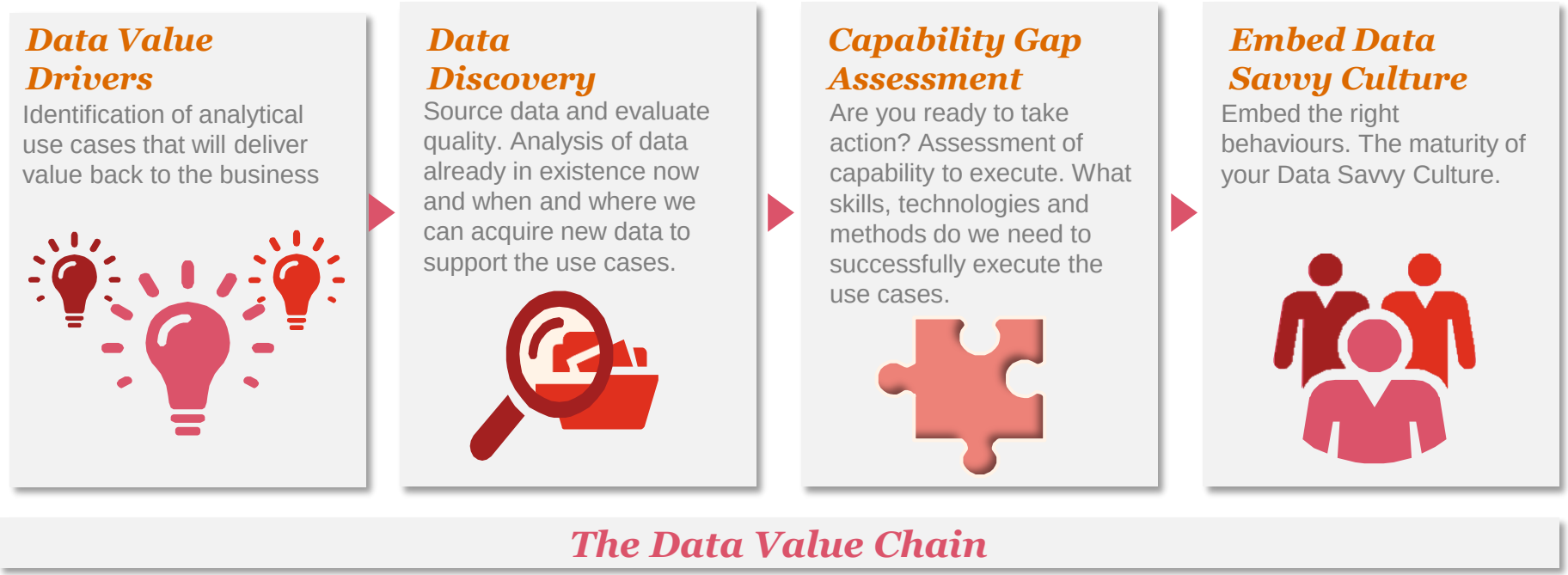
Considerations

4

Developing a data & analytics strategy

The data value chain concept and method is a means to develop a corporate data & analytics strategy.

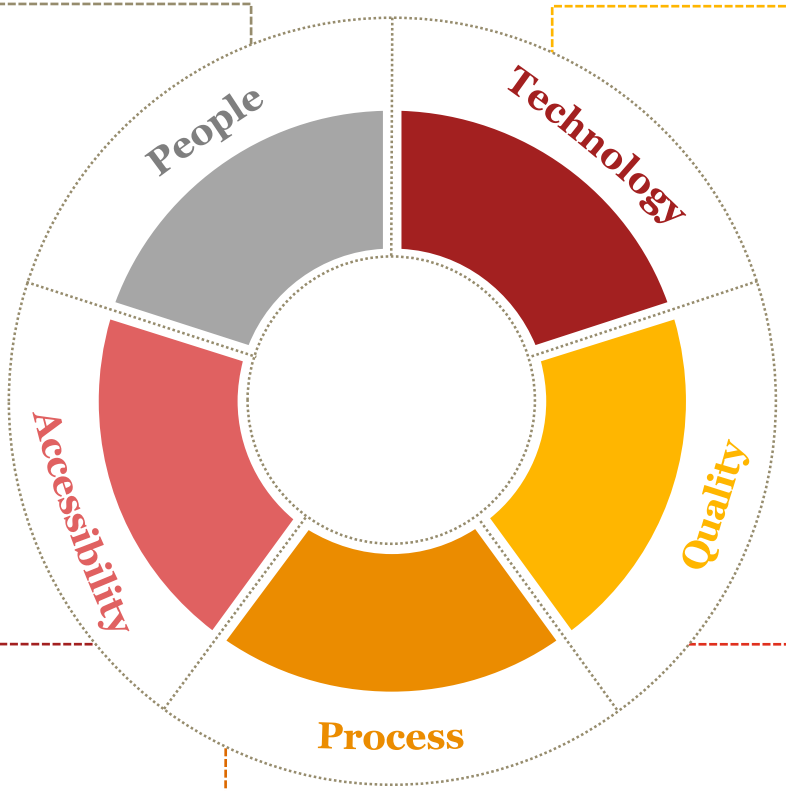
The approach is based on an analysis and prioritisation of the following key inputs:



Based on these inputs it is possible to create a prioritised roadmap to deliver use cases to the business.

Things to consider

- Do you have appropriately skilled staff to perform analytics?
- Are there skilled and supported staff already providing data & analytics across the business?



- What are the source systems which hold the relevant data?
- Do the source systems interact with each other?
- Is there central data repository e.g. data warehouse?
- What data analytics tools are used or available across the business already?

- Is information easily available?
- Does the available information require manual alteration?
- Is there a master data source or multiple versions of the truth?

- Is data quality trusted by staff?
- Does the organisation continually assess & enhance the quality of data across all source systems?
- Is the level of data quality sufficient to perform advanced analytics?

- Are there well governed and connected processes and systems which enables the seamless flow of data across the organisation?
- Are processes well defined and understood across the business?

For more information:

Carys Davies
carys.l.davies@pwc.com