Tackling Data Quality Problems: As Simple As A2E

Adept Events Training

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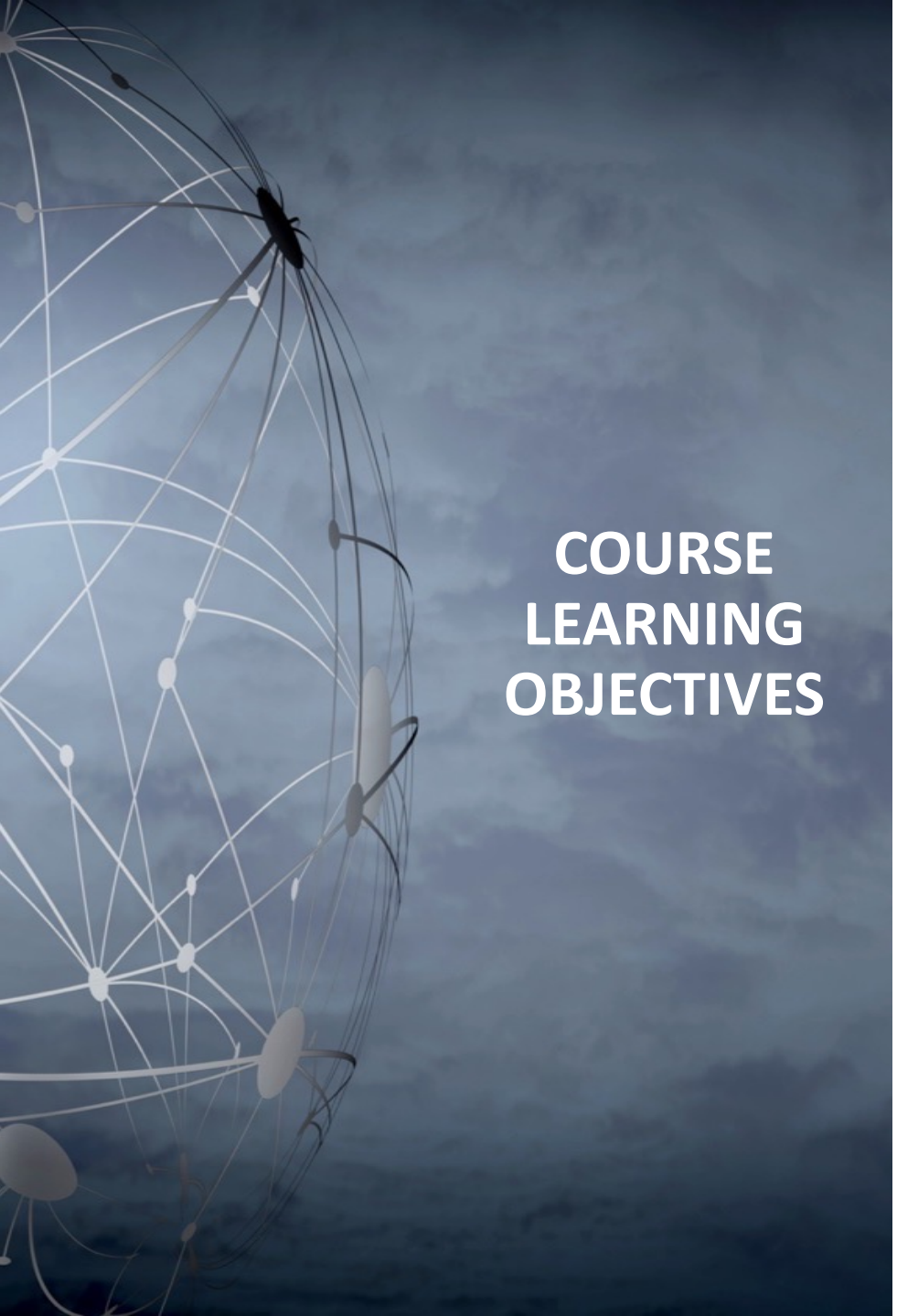
Tuesday 5 December 2023

AdeptEvents

Global Data Strategy

The Business of Data



COURSE LEARNING OBJECTIVES

- Understand what ‘fit for purpose’ data is, and is not
- Describe the dimensions of data quality
- Know the main causes of poor data quality
- Highlight the impact of poor data quality on individuals and organisations
- Understand the relationship between data quality and other data management disciplines, with particular emphasis on data governance
- Highlight the shortcomings of traditional ways of tackling poor data quality and the importance of a holistic approach, involving people, process and technology
- Learn the five steps of the A2E methodology and how to apply it to identify, prioritise and address data quality problems
- Specify and apply the main activities and deliverables of each of the five steps
- Be able to understand and develop business rules to baseline data quality and to set improvement thresholds
- Be aware of software tools that can help to support and automate the A2E approach

Course Logistics

- Start at 9:00 and end at 13:00
- There will be three 10-minute breaks during the course
- Note that you will receive today's slides as a PDF after the course
- This is an interactive course so please contribute to the discussions and activities
- Please also complete course evaluation forms after the end of the course

Course Agenda (Indicative)

SESSION	TITLE	START TIME	END TIME
1	Scene Setting & Introductions	9:00	9:20
2	Data Quality: The Basics	9:20	10:00
	Break	*10:00*	*10:10*
3	Holistic Approaches to Data Quality Improvement	10:10	10:20
4	The A2E Approach: **A**SSESS	10:20	11:00
	Break	*11:00*	*11:10*
5	The A2E Approach: **B**ASELINE	11:10	11:40
6	The A2E Approach: **C**ONVERGE	11:40	12:00
	Break	*12:00*	*12:10*
7	The A2E Approach: **D**EVELOP	12:10	12:35
8	The A2E Approach: **E**VALUATE	12:35	12:45
9	The Future of Data Quality	12:45	12:50
10	Summary & Conclusions	12:50	13:00

Introductions

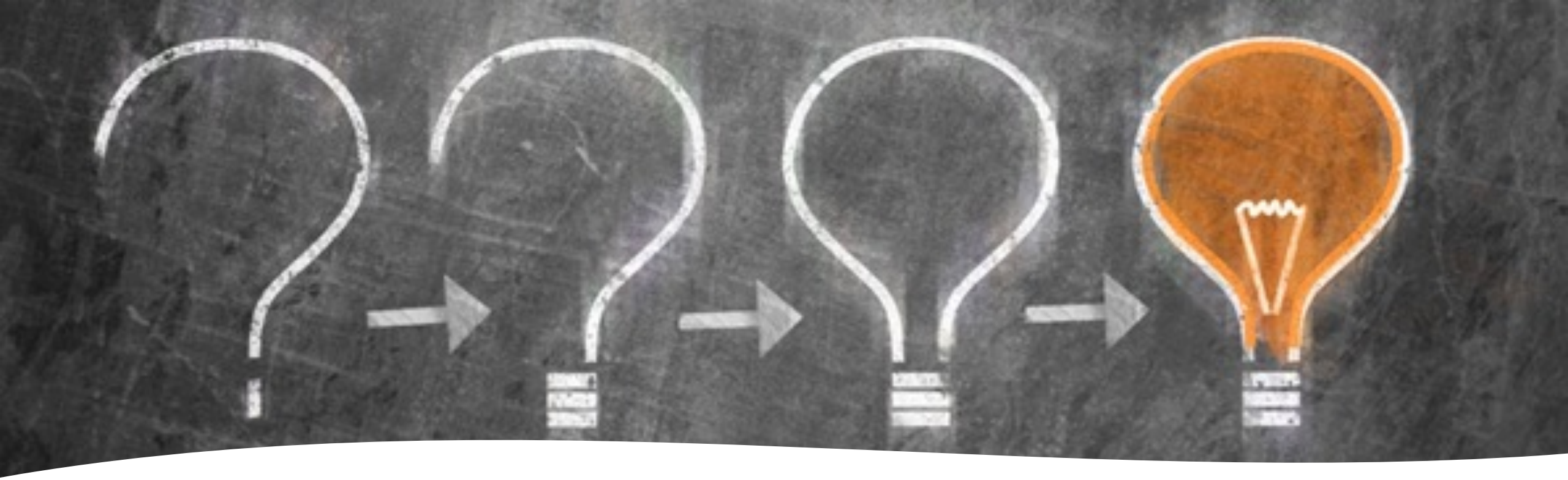
Please briefly introduce yourself by sharing:

- Your name, job role and organisation
- Your experience of data management / data quality
- What do you want / expect to get out of this course?

Who Am I?

- 35 years' experience in IT & Business Strategy; 27 years in Data Management
- **2015 to present:** Principal Information Management Consultant EMEA, Global Data Strategy. Worked with private and public sector clients in the UK and Europe, North America and the Middle East. Currently acting Chief Data Officer at a global financial company.
- **2010 to 2015:** IT & Data Consultant at Trillium Software, IPL and FromHereOn (Enterprise Architects)
- **1981 to 2010**: Worked for British Telecommunications (BT) as graduate entrant, programmer, business analyst, project manager, programme manager, unit head, director. Ultimately ran a £15 million revenue Information Management & CRM practice.
- **1997 to 2005**: While at BT, led an Information Quality improvement programme that delivered recorded benefits of over £650m and was praised by Gartner, Forrester and others
- Former Vice Chair of the Data Management Association of the UK (DAMA UK) and still a DAMA UK Committee Member
- Born and still live in Wales in the United Kingdom

Follow on Twitter - @NigelTurner8
Follow on LinkedIn - https://www.linkedin.com/in/nigelturnerdataman/



DISCUSSION

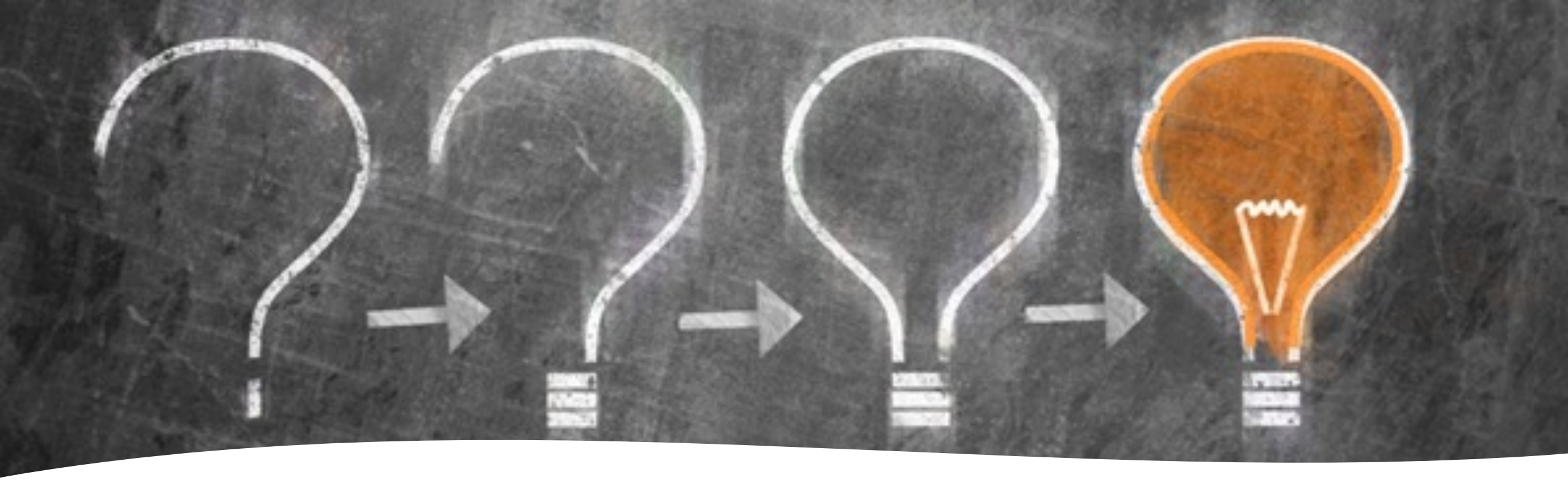
- What is Data Quality?
- How do you know if Data Quality meets user and business needs?

Data Quality – A Simple Definition

Data that is demonstrably fit for purpose

Demonstrably: Implies that data quality & improvement can be measured, and business impact demonstrated

Fit for Purpose: Data quality must meet the needs of the organisation and its stakeholders



ACTIVITY

Work through the following examples:

- What do you think are desirable and achievable levels of data quality ‘fitness for purpose’ in each?
- Answer as a percentage from 0% to 100%

Use Cases 1 & 2: 'Fit for Purpose'

USE CASE 1

You are a marketeer within a consumer products business. Your company is about to launch a new product. You choose initially to target this product at your existing customer base.
To do this you decide to send an email to every customer on your marketing database. However, some customers may have moved without informing you, and you know you have duplicate records on the database. What should your data quality target be and why?

ANSWER	%	REASON:

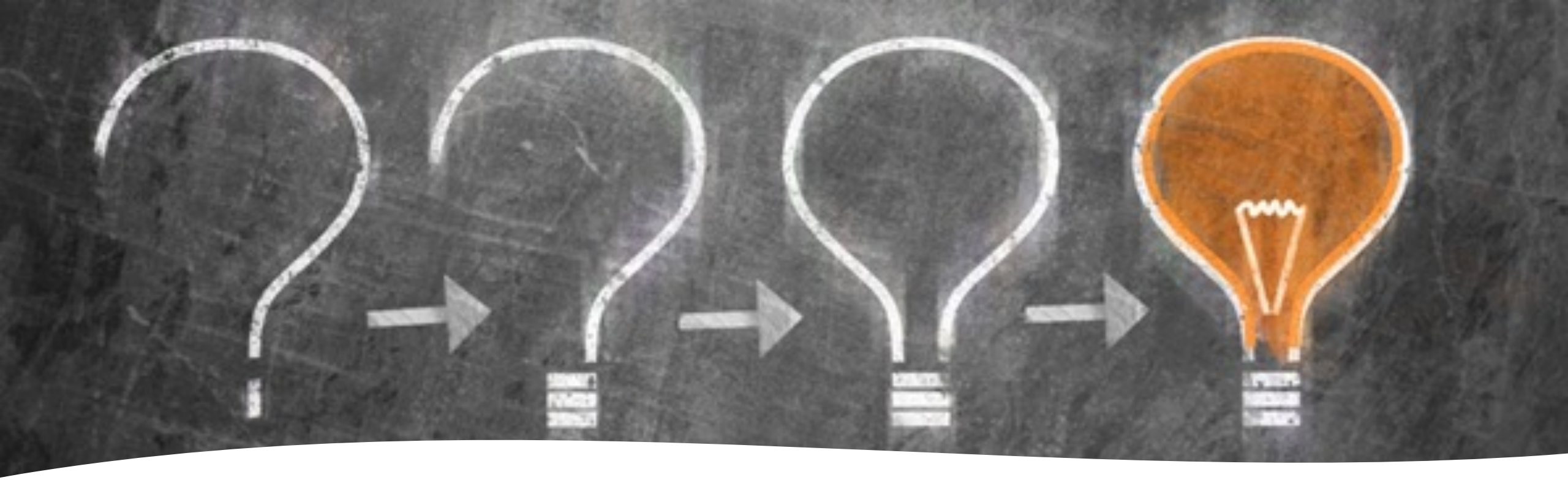
USE CASE 2

You are a student records manager in a College of Further Education. Your job is to ensure that marks obtained by students on courses run by your college are recorded in a central database. You strive to enter records accurately but know that as you put marks manually into the database occasionally you enter a wrong score. In any case the lecturers who provide you with the marks themselves make mistakes. Eventually you know that someone will notice any errors (often the student) and the marks can be corrected.

ANSWER	%	REASON:

‘Fit for Purpose’ Data

- ‘Fit for purpose’ implies that 100% data quality is not always required or necessary
- What is ‘fit for purpose’ depends on the specific needs of the organisation
- When assessing what ‘fit for purpose’ means in any particular use case, it is important to understand the specific business context and use of the data
- When data is used for several different purposes, the definition of ‘fit for purpose’ will vary from user to user
- Where this happens, ‘fit for purpose’ data ideally needs to meet the needs of all its users; where not possible or practicable a compromise should be sought



DISCUSSION

- What might go wrong if data is not fit for purpose?

ACTIVITY

Data Quality Horror Stories Quiz

Data Quality Horrors Quiz – Question 1

In April 2021 a report highlighted that "a serious incident" had occurred at Birmingham airport, UK in July 2020. Three planes took off that day, but the total weight of each of these planes was underestimated by an average of 1,200kg per flight. As weight is key in determining the take off speed this error could have caused a potential catastrophe.

This problem was the result of:

a) ***Pilot error as the pilots misread the weight calculations provided***
b) ***The system which calculated the weights had inbuilt business rules that assumed every passenger with the prefix 'Miss' was a child***
c) ***The weight information provided was wrongly labelled in Pounds (lb) rather than Kilograms (kg)***
d) ***The weight of the passenger luggage in the hold had been omitted from the calculations***

Data Quality Horrors Quiz – Question 2

In a wide ranging survey in 2017, The Harvard Business Review asked 75 executives across 75 different organisations to extract 100 records from core systems in their companies to analyse if the records contained data quality errors.

The results of the survey showed that the percentage of the 100 records which contained one or more critical data quality errors was:

a) 17%

b) 47%

c) 77%

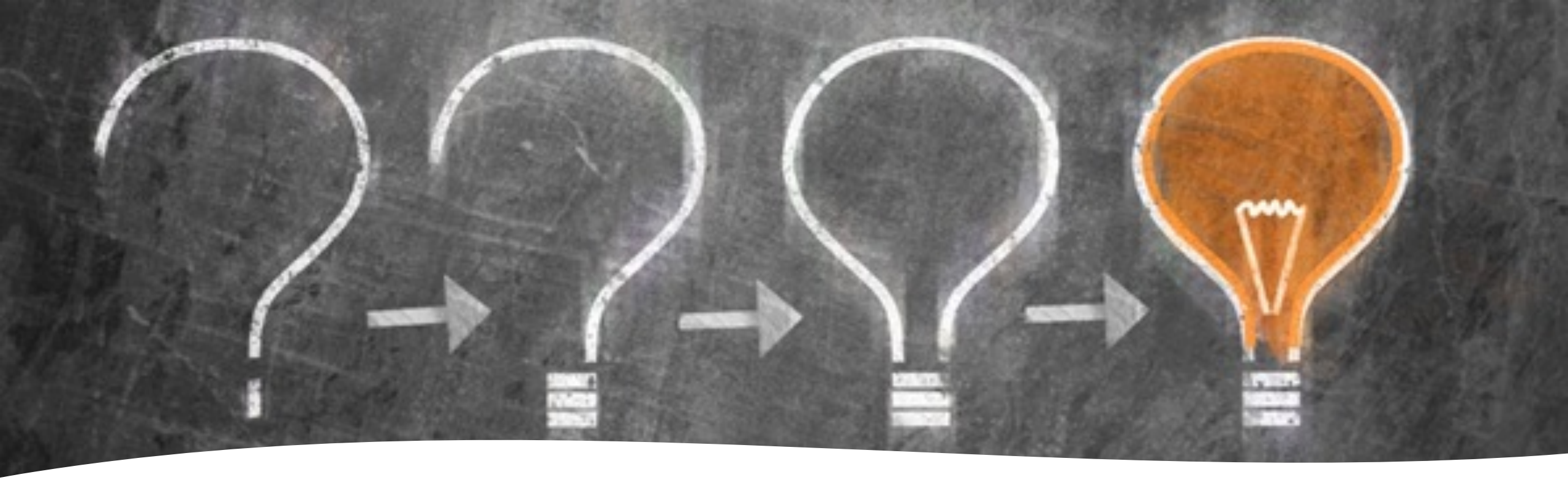
d) 97%

Horror Story 2: Evidence of Failure

Source:
Only 3% of Companies' Data Meets Basic Quality Standards

Tadhg Nagle, Thomas C. Redman & David Sammon

Harvard Business Review
September 11 2017



DISCUSSION

- How does this compare with your own organisation?
- Would you say it was better, the same or worse?

The Industry Impact of Poor Data – The Evidence

On average, half of all organisations believe at least 26% of their data is inaccurate

(Source: BARC 2019)

On average, poor data quality costs companies between 15-25% of revenue

(Source: MIT Sloan 2017)

Most organisations believe at least 30% of their customer data is inaccurate; 49% do not trust the data in their ERP or CRM systems

(Source: Experian 2019)

Companies lose on average $13 million a year because of poor data

(Source: Gartner 2021)

Law & Regulation: a reminder

GDPR 2018: the Six Key Principles

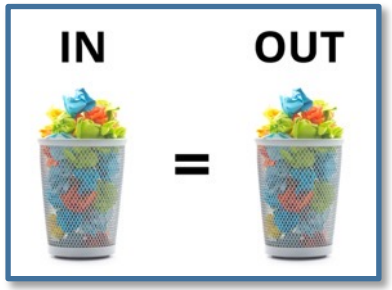
Data should be:

1. Processed lawfully, fairly and in a transparent manner…
2. Collected for specified, explicit and legitimate purposes and not processed further in a manner that is incompatible with those purposes…
3. Adequate, relevant and limited to what is necessary…
4. **Accurate, and where necessary, kept up to date…personal data that are inaccurate… are erased and rectified without delay**
5. Kept in a form which permits identification of data subjects for no longer than is necessary…
6. Processed in a manner that ensures appropriate security…

Source: Quant Marketing

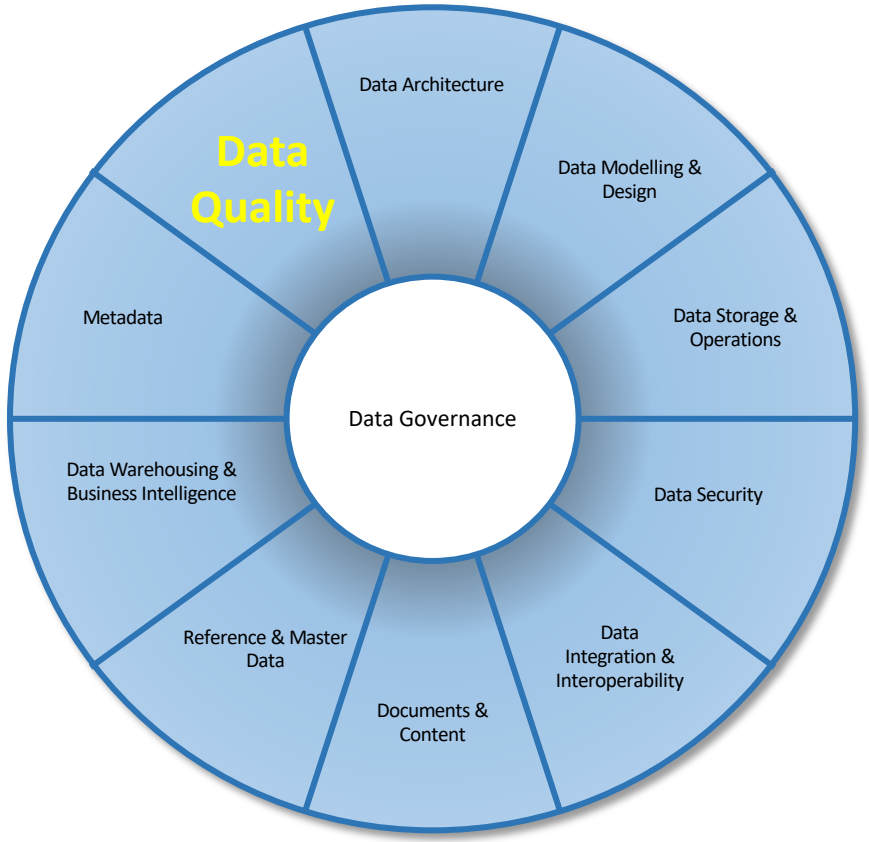
Data Quality – why it matters

- Data quality is a foundational data discipline
- Without 'fit for purpose' data quality all other data management disciplines (e.g. BI, MDM, Analytics etc.) can never deliver their promised benefits
- Poor data quality in organisations:
  - Increases costs
  - Leads to operational inefficiencies and lower productivity
  - Reduces revenues and profits
  - Increases risk – poor decision making, breaching legislative / regulatory requirements etc.
  - Damages organisational brand and reputation
  - Alienates customers and deters potential customers
- GARBAGE IN, GARBAGE OUT ……



Data Quality – relationships with other data disciplines

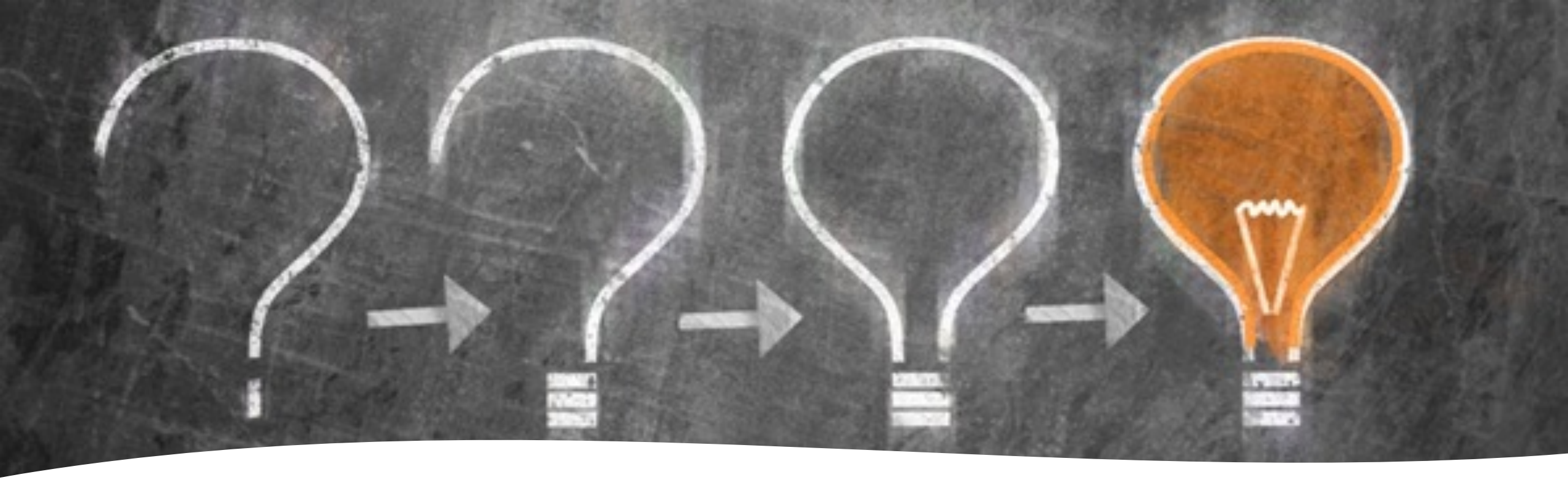
11 DATA DISCIPLINES



DAMA DMBOK – Version 2 2017

DISCIPLINE	EXAMPLE RELATIONSHIPS
Data Governance	DQ requires DG to drive & sustain improvement
Data Architecture	DA designs the structural framework for the management of DQ
Data Modelling & Design	DA&M identifies business definitions, entities & attributes to focus DQ improvements
Data Storage & Operations	Poor DQ impacts DS&O efficiency & reliability
Data Security	Poor DQ makes data less secure & more open to fraud
Data Integration & Interoperability	DI&O depends on defined & consistent data formats & content
Documents & Content	Good DQ practices support D&C, e.g. version control, tagging, taxonomies et al
Reference & Master Data	R&MD manages widely shared, business critical data, ensuring single truth, high quality data
Data Warehousing & Business Intelligence	DQ is the foundation of effective DW&BI (e.g. business definitions for KPIs etc.). Also garbage in, garbage out is as true as ever.
Meta-data	MD provides context & meaning to data and so enhances DQ

The Causes of Poor Data Quality



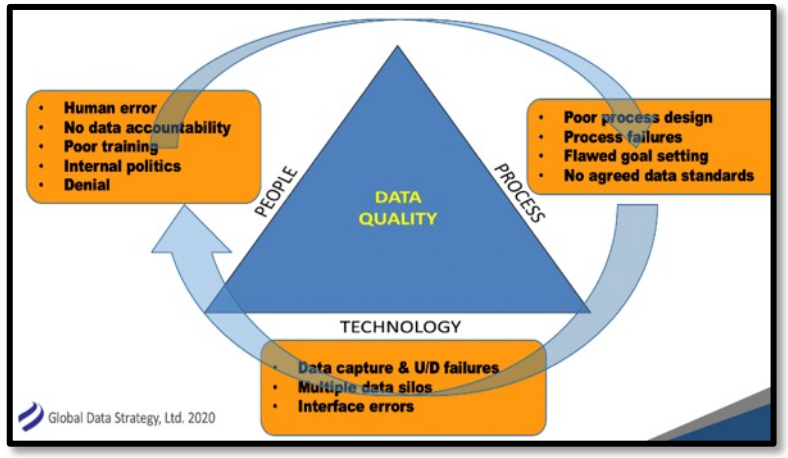
DISCUSSION

- Thinking about your own organisation, why is your data quality not always ‘fit for purpose’?

Why Does Poor Data Persist? (1)

The data world has become more complex & diffuse (Volume, Variety, Velocity)

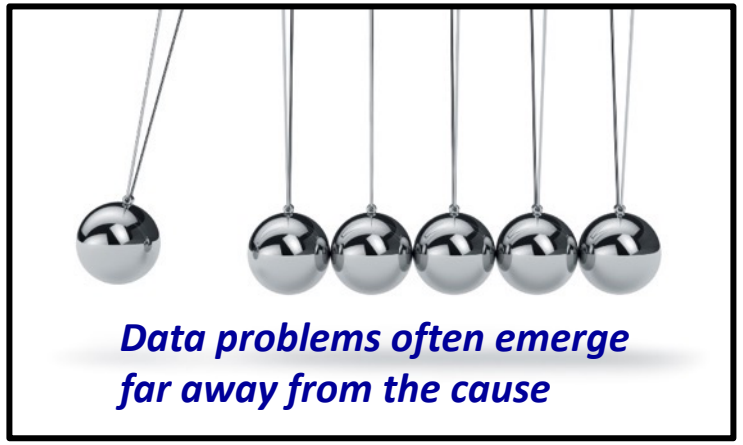
The world constantly changes, and data models the world



Poor data is a business problem, not an IT problem, so holistic solutions required

People will make mistakes with data (e.g. data entry, data amendment etc.)

Why Does Poor Data Persist? (2)



Data problems often emerge far away from the cause

Data flows horizontally, but organisational silos hinder collaboration

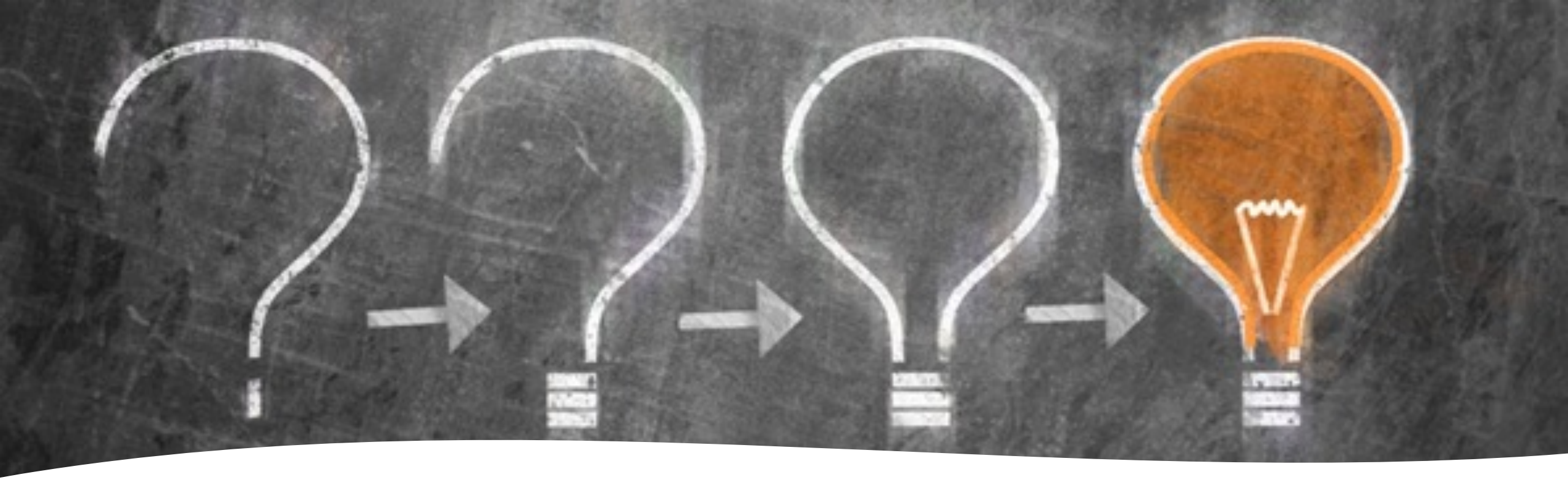
Absence or conflict of data definitions

Lack of context & metadata can cause misunderstandings and confusion

"If we are all supposed to be responsible, no one is responsible and nothing changes"

(Quote from senior GDS client – Professional Services Organisation 2019)

Lack of accountability for improving data



DISCUSSION

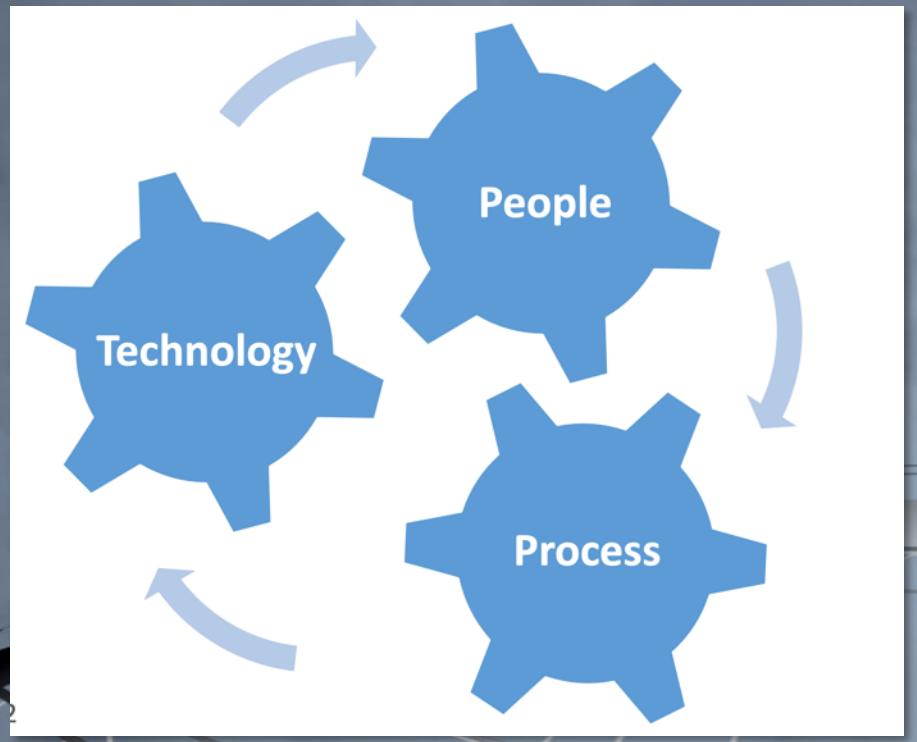
- How do these data quality challenges identified in a recent survey compare with yours?

Primary Data Quality Challenges

Headline Findings:

- Data quality challenges remain holistic, embracing people, process and technology issues
- Business challenges include culture change, skills, training, senior management buy in etc.
- Technical challenges include scaling, handling new data types, and managing data quality across multiple platforms and sources
- Challenges embrace all stages of the data lifecycle, from data creation to data usage and publication

Source: 2022 State of Data Quality, TDWI, James Kobielus
Available for download at https://globaldatastrategy.com/resources/white-papers/



A Better Way: Holistic Approaches to Data Quality Improvement

Data Quality – it's not about IF you do it but about HOW you do it

OPTION 1: FIGHT FIRES (REACTIVE)

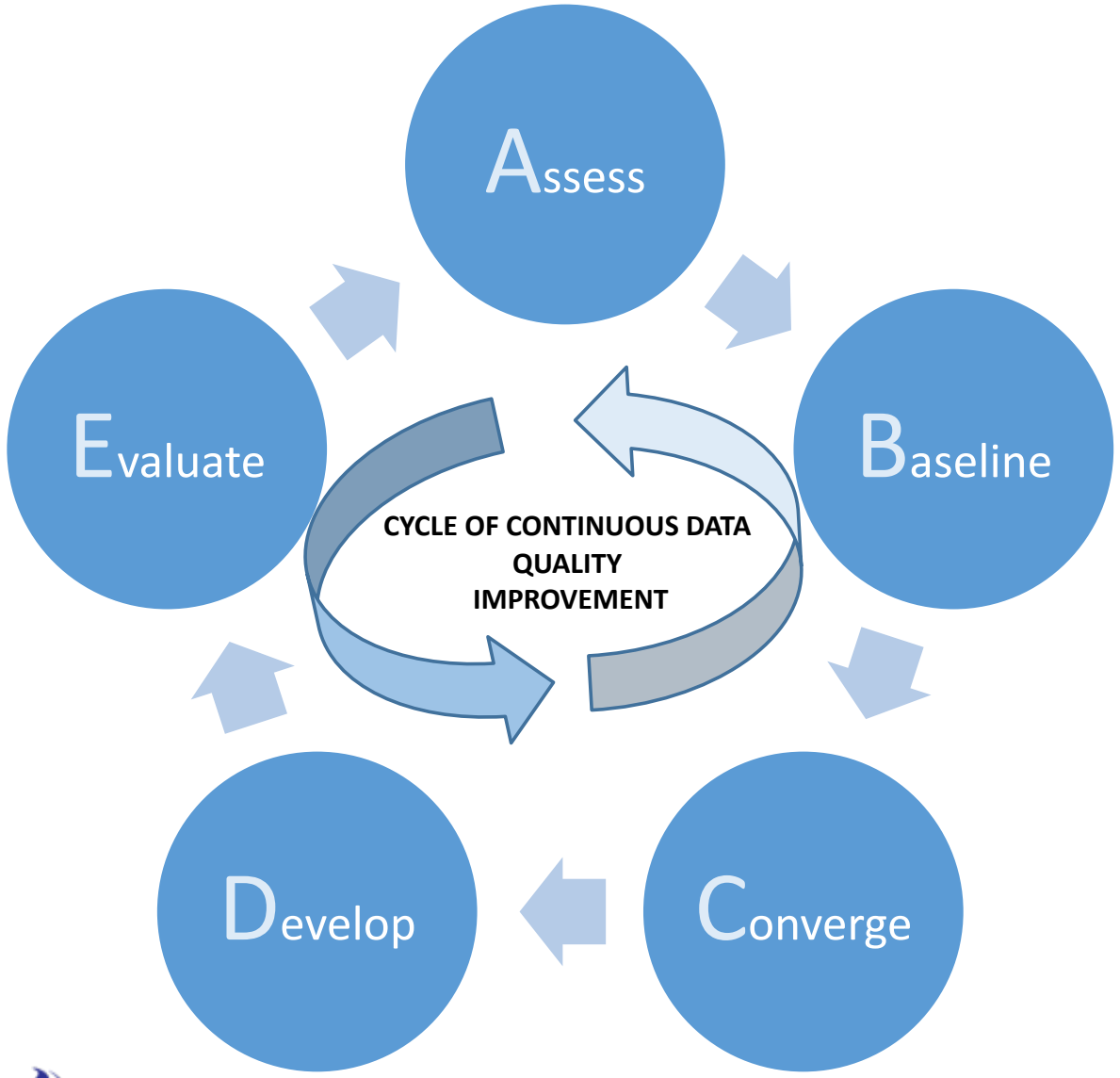
OPTION 2: PREVENT FIRES (PROACTIVE)

Traditional Approaches to Data Quality

- **Highlight a business or IT problem** where Data Quality is suspected or known to be a prime cause of the problem
- **Inspect data sources** and highlight data deficiencies, omissions and duplication
- **Develop data standards** and common data definitions
- **Build business rules** to enforce and police data standards
- **Automate data cleanse and enhancement projects**, using the business rules defined
- **Embed the standards & rules** into both batch and real-time environments to keep the data clean
- **Produce Data Quality KPIs** and measures to monitor ongoing quality and track trends

This approach still has value for specific data quality problems but is **REACTIVE** rather than **PROACTIVE**… a more rigorous approach is required to tackle and resolve organisation wide data quality problems

Tackling Data Quality: the Holistic A2E approach



Step	Purpose
Assess Business Usage	Understand what data exists and how it is used within the organisation
Baseline Data Sources	Baseline the current quality of the data and assess how well it is meeting business needs
Converge on Business Critical Areas	Focus priorities to optimise early business benefits and set 'fit for purpose' quality targets to guide improvement activities
Develop Improvements	Design & deploy improvement initiatives (encompassing people, process, and technology) and measure the impact against targets
Evaluate Benefits & ROI	Regularly measure the data and continue to improve it so that it continues to meet current and future business needs

The A2E Approach: Where To Use It

TOP DOWN

ORGANISATION

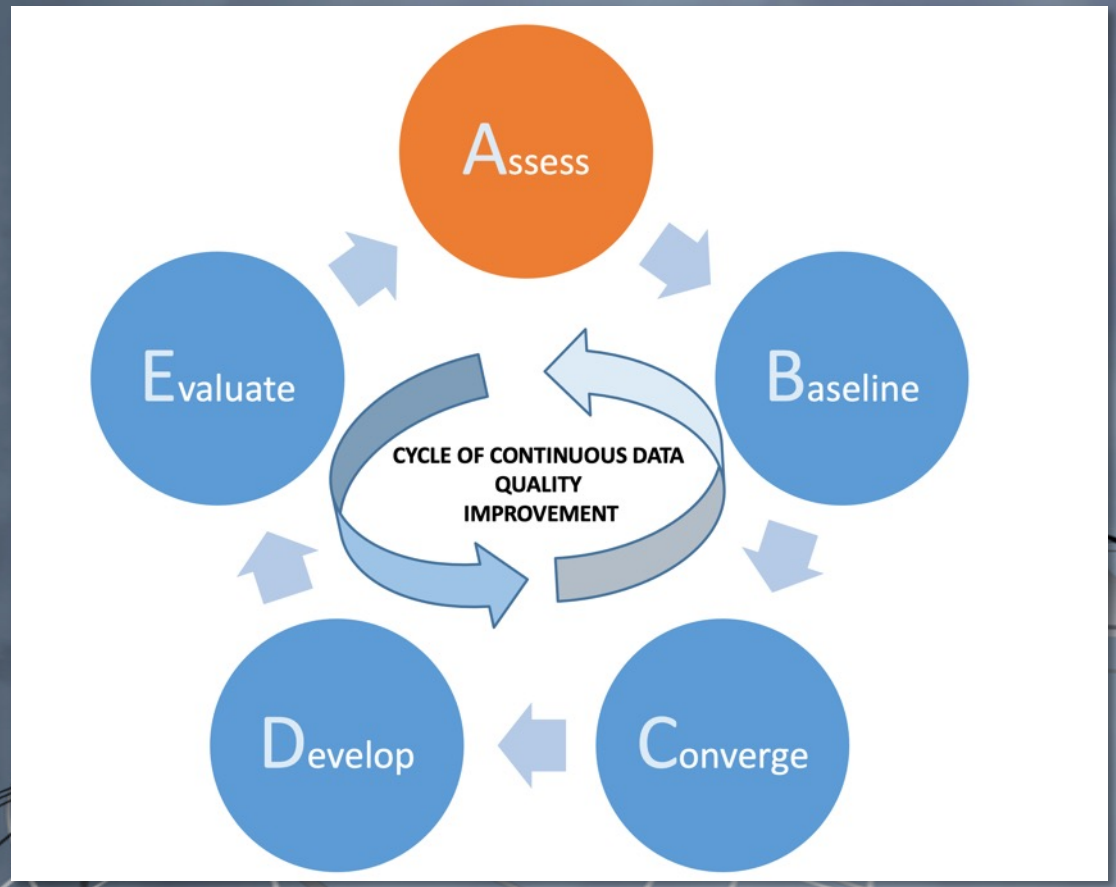
FUNCTION / PROCESS

DEPARTMENT

DATA DOMAIN

SPECIFIC DATA QUALITY ISSUE

BOTTOM UP



The A2E Approach: Step 1 – Assess

A2E Step 1: Assess

ASSESS THE BUSINESS LANDSCAPE

- Understand the business and its primary goals & objectives
- Analyse what data the business:
  - Relies on today
  - Will need to support its future aspirations
- Identify the primary data stakeholders:
  - Business
  - IT
  - External parties (e.g. customers, suppliers, partners)
- Work with them to evaluate current data 'fitness for purpose' and establish:
  - Where / how it is captured, stored and processed
  - What's working well
  - What needs to be improved
  - The potential benefits of better data quality
- Create a Data Quality Issues (& Opportunities) Log

POTENTIAL OUTPUTS & TOOLS

- Highlight:
  - Most important business critical data domains
  - Business impact
  - Main data creators and consumers
  - Accountability for the data
  - Current problems and issues with the data
  - Opportunities & potential benefits
- Outputs may include:
  - RACI Stakeholder Matrix
  - Rich Picture highlighting real-world issues
  - Data Quality Issues Log
  - Business Data Model / Conceptual Data Model
  - Business Process Model
  - ROI analysis

How to capture business goals and drivers (1) – Business

- Look at organisation / company websites & documents (external and internal, e.g. Annual Reports) to highlight:
  - Current Mission & Vision
  - Strategic business aims and goals
  - Current challenges – external and internal
- Consider how these depend on data and its effective management
  - For example, a business goal to **'Increase our revenues from our top 10% revenue generating customers'**
  - Data questions:
    - Can we identify our top 10% revenue generating customers?
    - What data issues may stop us doing that (data quality, data duplication, missing data etc.)
    - What are the business implications if we can't?

How to capture business goals and drivers (2) – Data

- Identify the primary data stakeholders (Include both Business & IT)
- Set up 1-1 interviews, group interviews or workshops to highlight:
  - How are you currently using or managing data in your role?
  - What's working well?
  - What needs to be improved and why?
  - What future data needs do you have and what opportunities can be taken with better (use of) data?
  - What are the current costs / lost opportunities of current data shortcomings? (Quantify in financial terms if possible)
  - What is your One Wish for data?
- It's important to speak to a wide range of roles across the organisation:
  - Senior Executives
  - Management roles (Business & IT)
  - Front line roles (Business & IT)

Example Stakeholder Matrix

Stakeholder Matrix

Stakeholder Name / Group	Job Title/Role	Location	Involvement				Role on Project	Influence	Impacted	Phone	Email
			R	A	C	I		H / M / L	H / M / L		
EXECUTIVE REVIEW											
Mary Smith	CIO	Plano, TX	X			X	Executive Sponsor	H	H	+1 (214) 555-1212	mary.smith@thisco.com
Robert Quantiles	CFO	New York, NY			X	X	Executive Chamption for Finance data	H	H	+1 (212) 555-1212	robert.quantiles@thisco.com
STEERING GROUP											
Stuart Ling	Director of Enterprise Architecture	San Francisco, CA	X	X			Core working group	H	H	+1 (415) 555-1212	stuart.ling@thisco.com
Ian Wordingham	Director of Data Strategy	London, UK	X	X			Core working group	H	H	+44 (020) 1234 1234	ian.wordingham@thisco.com
Melissa Smith	Strategic Consultant	Edinburgh, UK			X		Core working group	H	L	+44 131 123 1234	melissa.smith@thisco.com
DATA ARCHITECTURE											
Eric Wong	Data Architect	Plano, TX			X	X	Recommendations & input on data architecture	M	H	+1 (214) 555-1212	eric.wong@thisco.com
Wendy Collington	Data Architect	San Francisco, CA			X	X	Recommendations & input on data architecture	M	H	+1 (415) 555-1212	wendy.collington@thisco.com
Myles Stuart	DBA	Plano, TX				X	Historical input on legacy systems	L	M	+1 (214) 555-1212	myles.stuart@thisco.com
ETC - Other IT Groups listed											
FINANCE											
Lisa Winston	Director of Finance	New York, NY			X	X	Input into US finance needs for data	H	H	+1 (214) 555-1212	lisa.winston@thisco.com
Timothy Preston	EMEA Finance Lead	London, UK			X	X	Input into EMEA finance needs for data	H	H	+44 (020) 1234 1234	timothy.preston@thisco.com
Juan Morales	Latin America Finance Lead	Santiago, CL			X	X	Input into LATAM finance needs for data	H	H	+56 2 12345678	juan.morales@thisco.com
ETC - Other Business Groups listed											

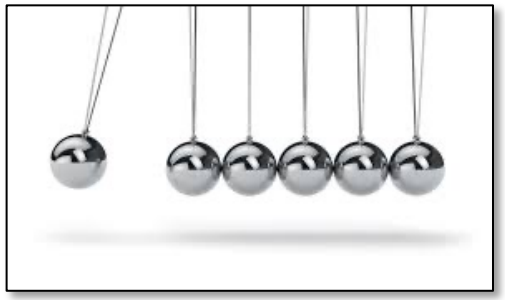
RACI *:
R: Responsible
A: Accountable
C: Consulted
I: Informed

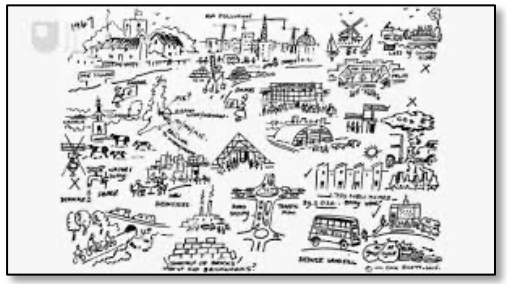
Data Issues & Opportunities Log: Suggested Template

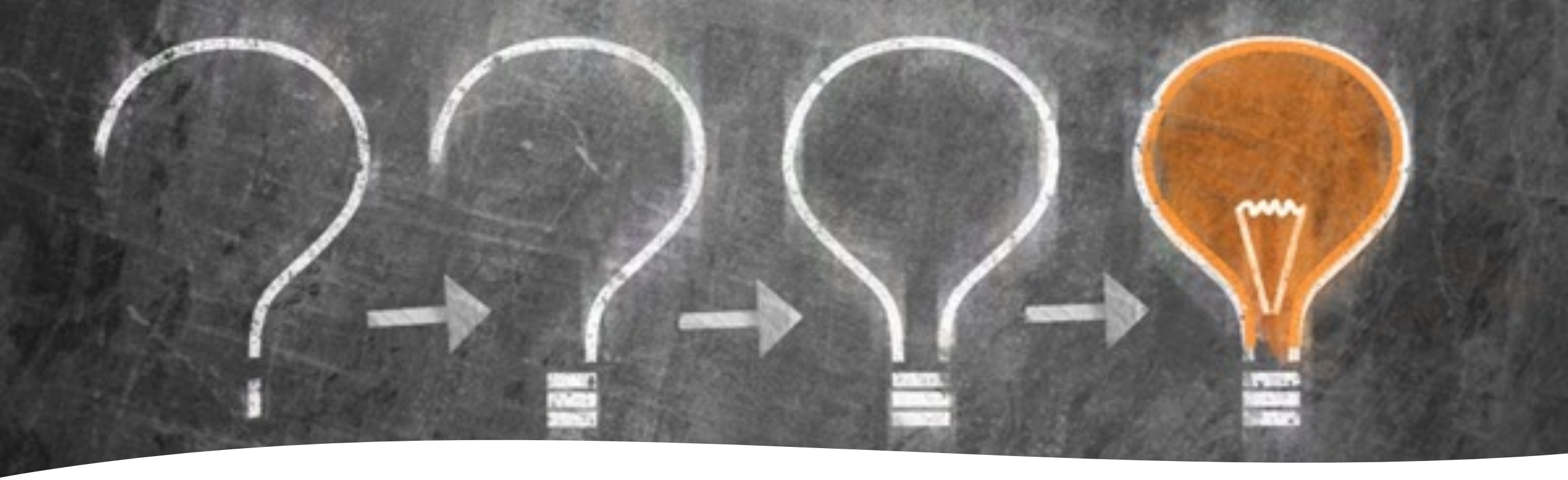
ID	Short Name	Brief Description	Impact of the Problem / Potential Opportunity (Business & IT)	Raised By
1	**Customer Data Duplication**	Both in the CRM platform and the Customer Data Warehouse there are known customer record duplications, mainly caused by marketing and sales people not being able or willing to search for an existing customer record. One estimate is that up to 25% of CRM customer records are duplicates. Data Warehouse duplication unknown.	• Multiple marketing communications sent to the same customer, causing brand damage • Inability to evaluate total customer lifetime revenue value • Impossible to derive a single view of a customer • Risks contravening GDPR if customer submits Data Subject Access Request (DSAR) and all data not returned • Resolving this problem would accelerate MDM ambitions and enable better targeted 1-1 customer marketing	• Bob Mills (Marketing Manager) • Anna Ford (CRM Technical Architect) • George May (Senior Sales Rep)
2				
3				

Data Quality Complexity & Value of Rich Pictures

- Data Quality is a ‘messy’ and complex issue:
  - Problems often poorly understood (e.g. data flows and lineage)
  - Lack of information & hard facts (e.g. measures)
  - Large numbers of people involved with differing perspectives (e.g. data producers, data consumers, senior executives, customers, suppliers)
  - Problem ownership unclear (e.g. problem origins and impacts)
- Rich Pictures have great value:
  - Ideal starting point for complex (messy) organisational problems like data quality
  - Holistic, embracing people, process & technology
  - Highlight interconnectedness of problems
- Best initially created in a workshop (whiteboard and coloured pens ideal!) - encourage participants to contribute
- Primary use is to derive ‘problem themes’ to enable focus on key issues







DISCUSSION

- The following Rich Picture is of a hotel chain and its data problems
- What are the main Data Quality themes that you can identify from the diagram?

RICH PICTURE OF DATA QUALITY PROBLEMS AT ACME HOTEL & CASINO GROUP

1 HOTEL = 1 DATABASE

DUPLICATE CUSTOMERS

Single Customer View

6 CASINOS

10 NIGHTCLUBS

OUTMODED IT

CIO

GROWTH

CEO (NEW)

COST REDUCTION

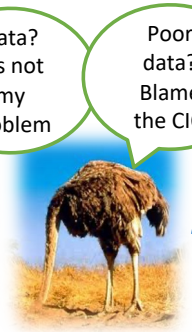
STOCK PRICE

LOYALTY SCHEME

60 HOTELS

BUSINESS & IT MEETINGS

POOR DATA QUALITY

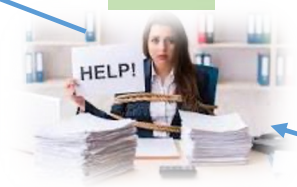


BUSINESS

SHAREHOLDERS

Valet Parking: Stubs not submitted loss £2.5M pa

CMO



Untrusted financial results

CFO

COO

41% of all supplies are Emergency Supplies; cost £21.7m

406 email addresses for Mickey Mouse in CRM

£315k lost on returned magazines

ACME TRAVEL MAGAZINE

Finance data rework & delay

RICH PICTURE OF DATA QUALITY PROBLEMS AT ACME HOTEL & CASINO GROUP

PROBLEM THEMES

Uncontrolled customer data duplication

1 HOTEL = 1 DATABASE

No single customer view

Single Customer View

6 CASINOS

10 NIGHTCLUBS

OUTMODED I

Potential need for IT investment

CEO (VIEW)

COST REDUCTION

STOCK PRICE

LOYALTY SCHEME

60 HOTELS

POOR DATA QUALITY

Lack of business accountability for data

BUSINESS

Cultural issues about data capture

Stubs not submitted loss

Poor marketing data quality

£315k lost on returned magazines

ACME TRAVEL MAGAZINE

SHAREHOLDERS

Financial data trust and rework

CFO

Finance data rework & delay

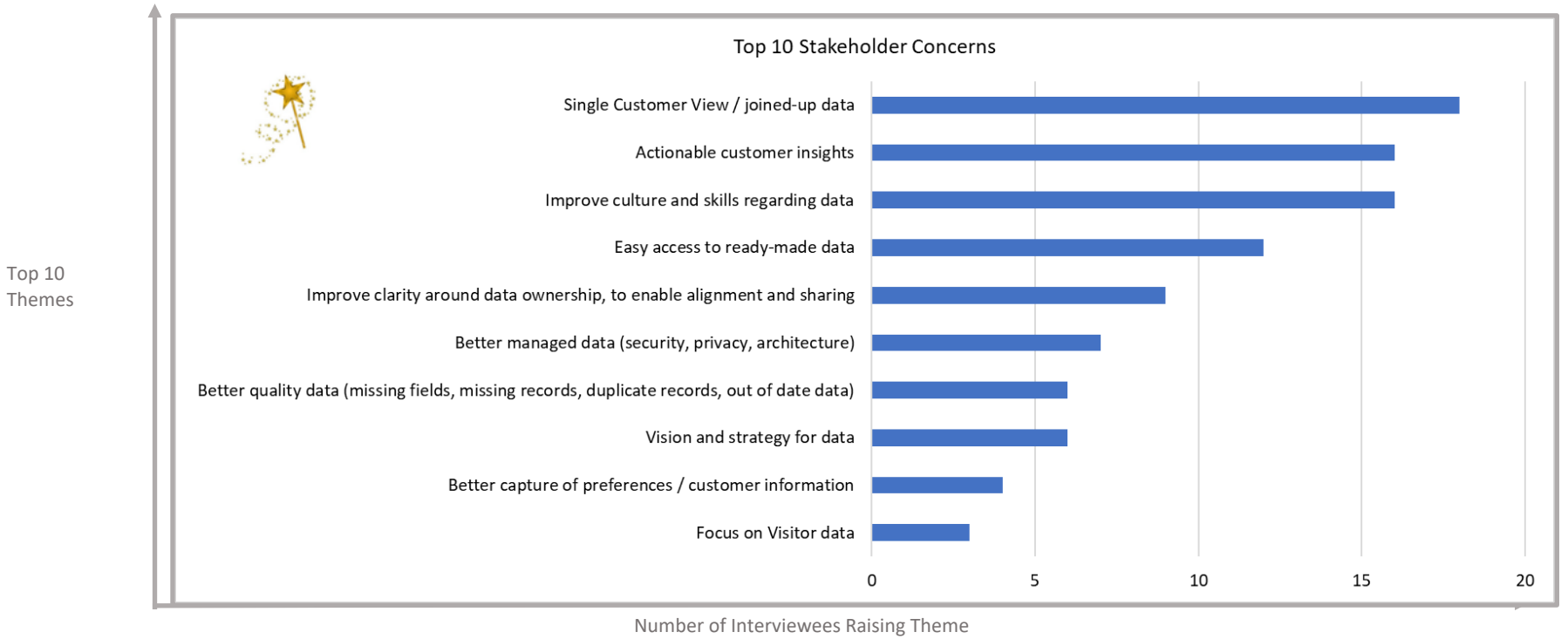
Supply management problems

41% of all supplies ar Emergency Supplies; cost £21.7m

COO

406 email addresses for Mickey Mouse in CRM

Example: What is your One Wish related to data?
Top Themes: All Stakeholders



AnyCo faces some challenges due to its operating model of multiple businesses, and this came through strongly in the themes such as "Single Customer View / joined-up data" and "Improve clarity around data ownership, to enable alignment and sharing"

Total stakeholders interviewed = 63

See Appendix for list of Stakeholders, and details on Departmental findings

Data Quality: Real Example Motivation Model

Motivation for Customer Data Domain Improvement

External Drivers highlight changes in the external environment that need to be addressed

Internal Drivers highlight internal functional or company initiatives

XX - Current Customer Data Importance

To support and enable excellent personalised customer relationships

XX – Future Data Vision

To enable all future service provision via online customer interaction

External Drivers

Increased Competition	Digital Transformation	Rise of Online Sales Channels
Consumer Advocacy	Compliance and Regulation	Social Media & Online Community

Internal Drivers

Revenue & Market Share Growth	Direct To Consumer (DTC)	Digital Transformation
Efficiency & Process Automation	Risk Reduction	Mergers & Acquisitions

High Level Goals
Specify main goals of DQ Roadmap
(NB: Headings can be varied)

Customer Data Improvement – High Level Goals

Governance

- Personal responsibility for data
- Cross-functional collaboration
- Aligned projects to deliver enhanced customer data management foundation

Data Quality

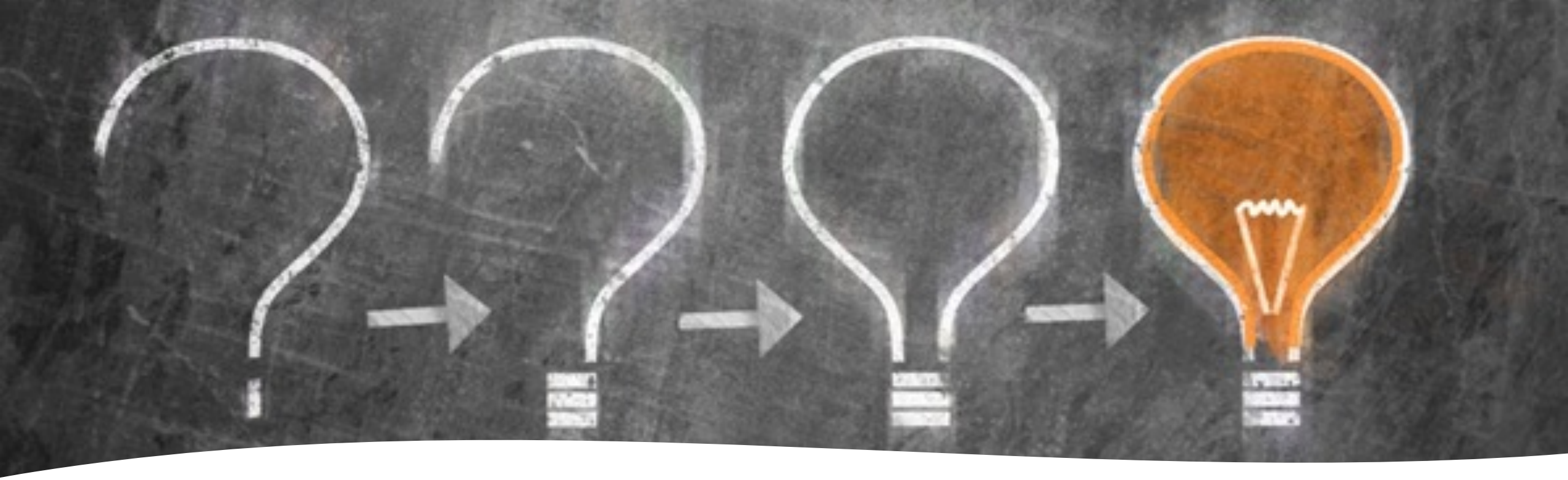
- Single version of the truth
- Automate data entry & checking
- Ensure that key data is fit for business purposes

Innovation

- New perspectives into the business and the market
- Understand customers & their needs
- Feedback into new product & service development

Business Insight

- Data-driven, fact-based decision making
- Data available to all who need it
- Real time operational & predictive analytics capability



ACTIVITY

- What are the main External and Internal drivers for better Data Quality in your organisation?
- Try to list 5 External and 5 Internal drivers

Your Organisation – Business Motivation & Drivers for Better Data Quality

Suggest 5 internal and external drivers

EXTERNAL DRIVERS

1. _____
2. _____
3. _____
4. _____
5. _____

INTERNAL DRIVERS

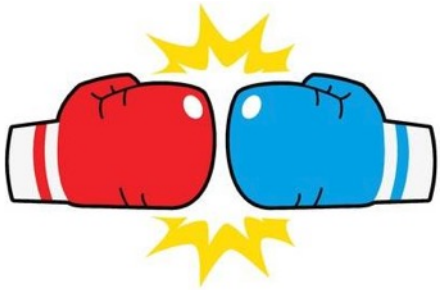
1. _____
2. _____
3. _____
4. _____
5. _____

"Offence" vs. "Defence"

What are your main reasons for improving Data Quality in your organisation?

Offence

- Focused on Creating Opportunity
  - Improving Profitability
  - Increasing Revenue
  - Improving Customer Satisfaction
  - Gaining Competitive Advantage



Defence

- Focused on Reducing Risk
  - Ensuring Compliance & Regulation
  - Avoiding Audits or Fines
  - Fraud Detection
  - Security & Privacy

Discussion: On which end of the spectrum is your organisation?

Making the Case for Action

While Business Cases and ROI Calculations can be complex, they generally fall into 4 categories:

Decreasing Costs

- **Wasted labour costs due to manual efforts**
  (Data cleansing, finding data, manual integration, etc.)
- **Inefficient business processes for data management**
  (Product Master Data process)
- **Data quality cost avoidance**
  (Wasted mailings sent to wrong addresses)

Increasing Revenue

- **Price optimisation through Analytics**
- **Improved marketing campaigns through quality customer data**
- **Data-driven recommendation engines to enhance the sales cycle**
- **Better grant applications through data-driven needs analysis**

Reducing Risk

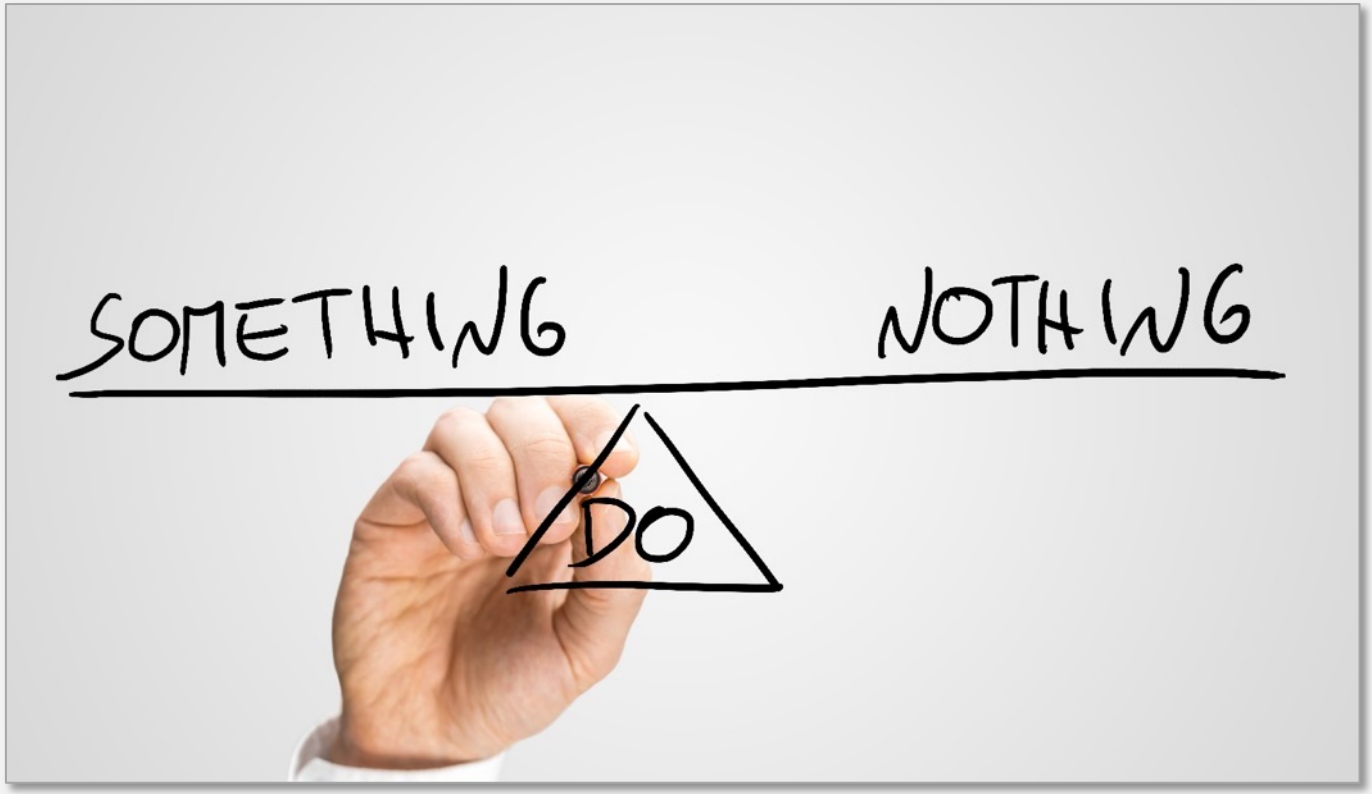
- **Industry regulations**
  (GDPR, HIPAA, BCBS 239, Spice, HIPAA, etc.)
- **Product traceability**
  (Food lineage from farm/catch)
- **Litigation due to data breaches**
- **Health and safety audits**

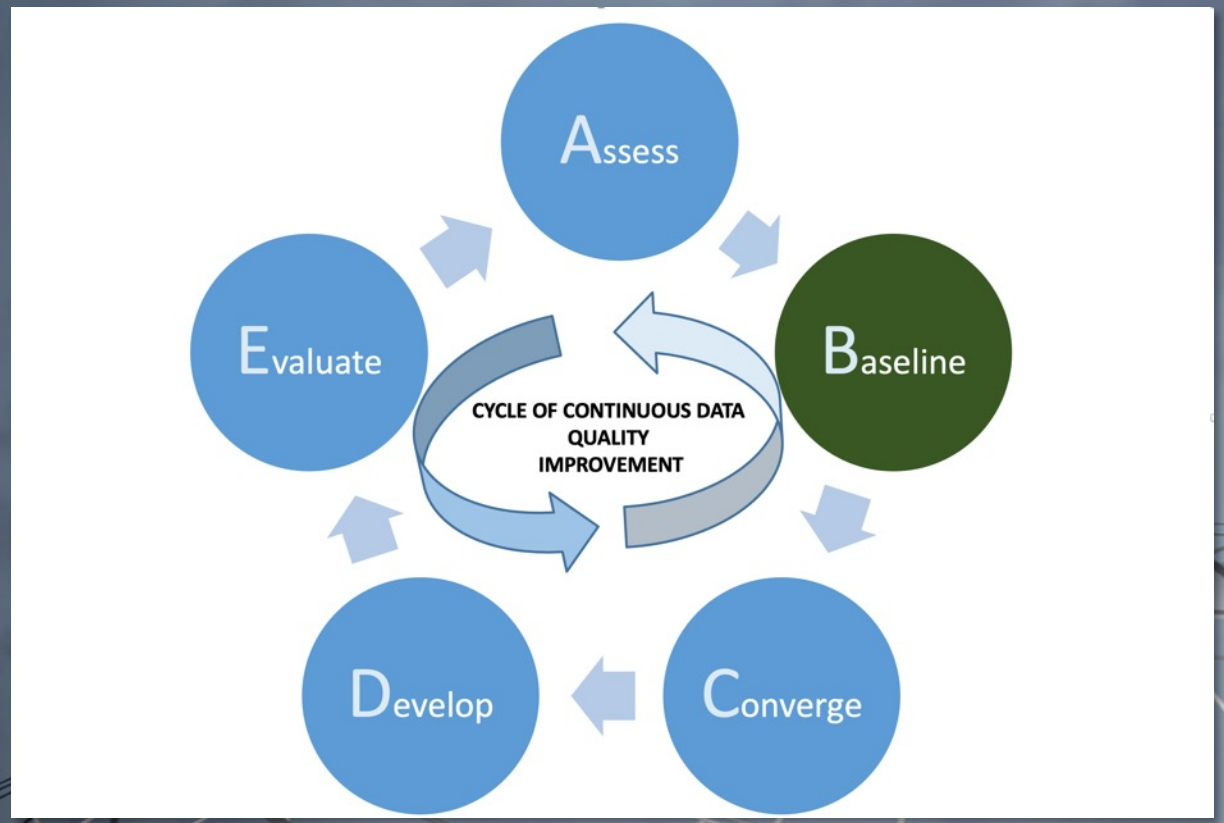
Protecting Reputation

- **Customer satisfaction**
- **Brand trust**
- **Social media voice of consumer**
- **Loyalty & 'stickiness'**

Include the Risk of Doing Nothing

- There is significant cost and risk in the status quo
- Doing nothing often has a higher cost than investing in data quality
- Make sure to include the “do nothing” option in your analysis





The A2E Approach: Step 2 – Baseline

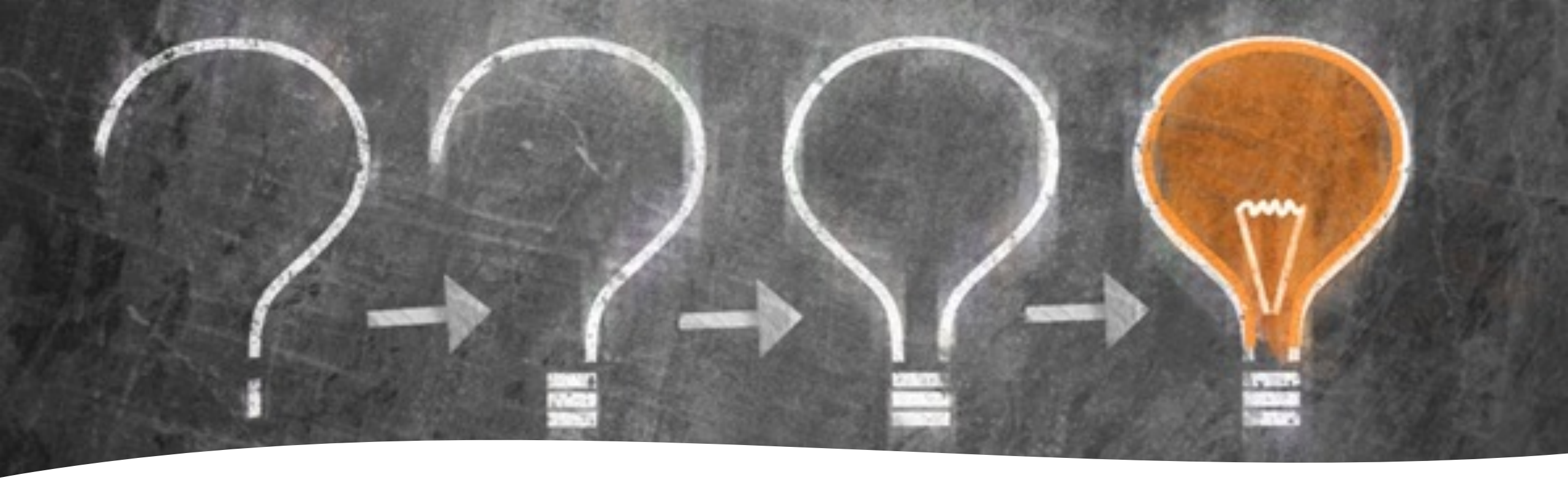
A2E Step 2: Baseline

BASELINE CRITICAL DATA SOURCES

- Gives a quantitative view of key data quality problems
  - Measure the baseline quality of key data sources to quantify the issues
- To do this:
  - Select the key data sources and data domains identified in the Step 1 Assessment
  - Profile the data (ideally use a data profiling tool) and focus on key objects and attributes
  - Assess the data according to the 7 Dimensions of Data Quality – see later
  - Present the results to relevant stakeholders - gain consensus on the business impact of the problems found
  - Expand and refine the Data Quality issues log

POTENTIAL OUTPUTS & TOOLS

- Data Quality Report(s)
- Data Profiling outputs – derived metadata
- Updated Issues Log, with quantification of financial costs and other business impacts



ACTIVITY

- From this extract of a real HR data source, list all the real or suspected data quality problems you can identify

Hint: There are at least 13 problems

ACTIVITY – Extract of HR data source

EMPLOYEE NO	SURNAME	FIRST NAME	GENDER	DATE OF BIRTH	ROLE CODE
802540	Smith	Brian	Female	31/01/56	PM16
YN4176B	Gregg		Male	07/09/80	9999
811609	Patel	Priya	XXXX	25/12/78	AL60
22298	Bothroyd	Bridget	Female	28/08/09	TBD
802540	Smith	Bryan	Male	31/01/56	PM10
855265	Hayes	Leslie	Female	00/00/00	AL76
	Taylor	Kevin	Unknown	12/30/69	US18

Note: Records extracted and anonymised from an actual HR database

ACTIVITY – Extract of actual HR data source

EMPLOYEE NO	SURNAME	FIRST NAME	GENDER	DATE OF BIRTH	ROLE CODE
802540	Smith	Brian	Female	31/01/56	PM16
YN4176B	Gregg		Male	07/09/80	9999
811609	Patel	Priya	XXXX	25/12/78	AL60
22298	Bothroyd	Bridget	Female	28/08/09	TBD
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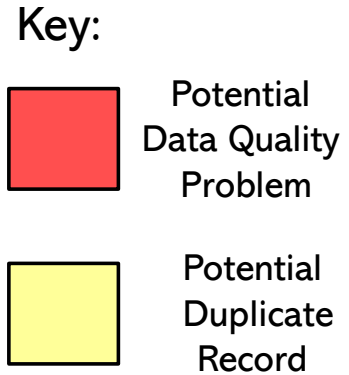
855265	Hayes	Leslie	Female	00/00/00	AL76
	Taylor	Kevin	Unknown	12/30/69	US18

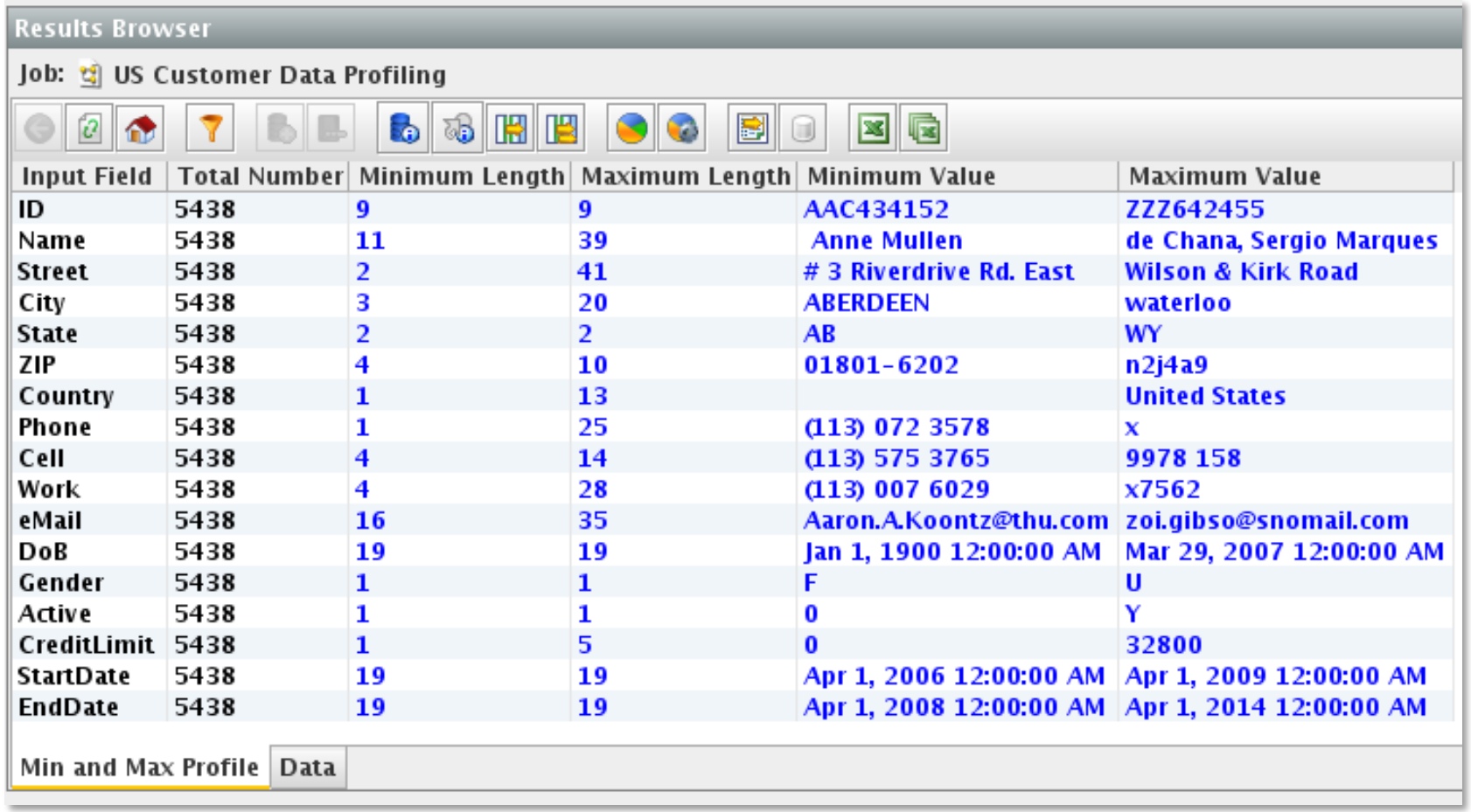


ANSWER: Total number of potential Data Quality problems is 13 or 19, depending on whether Smith is a duplicate record

Quantifying Data Problems: The Value of Data Profiling Tools

- Data profiling tools automate the process of assessing and reporting on the quality of data sources
- The benefits of data profiling include:

➢ Fast processing of large data sets
➢ Complete analysis of an entire data set, so identifies all outliers
➢ Some profilers enable drill down to individual records / rows
➢ Automatic generation of metadata
➢ Checks conformance of the dataset with business rules (pre-built or added)
➢ Enables fact based discussion of the causes and impacts of data problems
➢ Excellent starting point in data quality workshops


Results Browser

Job: US Customer Data Profiling

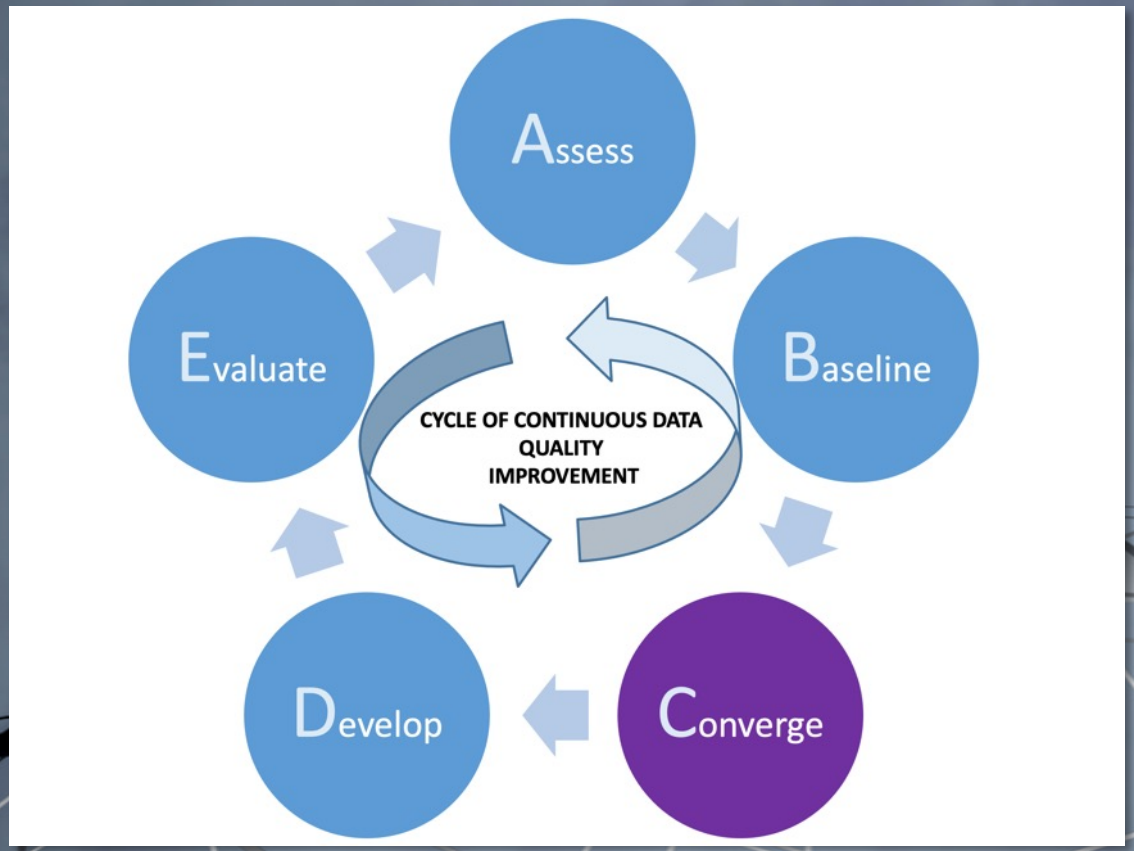
Input Field	Total Number	Minimum Length	Maximum Length	Minimum Value	Maximum Value
ID	5438	9	9	AAC434152	ZZZ642455
Name	5438	11	39	Anne Mullen	de Chana, Sergio Marques
Street	5438	2	41	# 3 Riverdrive Rd. East	Wilson & Kirk Road
City	5438	3	20	ABERDEEN	waterloo
State	5438	2	2	AB	WY
ZIP	5438	4	10	01801-6202	n2j4a9
Country	5438	1	13		United States
Phone	5438	1	25	(113) 072 3578	x
Cell	5438	4	14	(113) 575 3765	9978 158
Work	5438	4	28	(113) 007 6029	x7562
eMail	5438	16	35	Aaron.A.Koontz@thu.com	zoi.gibso@snomail.com
DoB	5438	19	19	Jan 1, 1900 12:00:00 AM	Mar 29, 2007 12:00:00 AM
Gender	5438	1	1	F	U
Active	5438	1	1	0	Y
CreditLimit	5438	1	5	0	32800
StartDate	5438	19	19	Apr 1, 2006 12:00:00 AM	Apr 1, 2009 12:00:00 AM
EndDate	5438	19	19	Apr 1, 2008 12:00:00 AM	Apr 1, 2014 12:00:00 AM

Min and Max Profile | Data

Example partial Data Profiling report

The Importance of Business Review & Validation

- Data profiling findings should be reviewed by appropriate business & IT stakeholders
  - If formal Data Governance in place, this should ideally led by the Data Stewards responsible for the specific data areas (see later)
- Aim to reach consensus on what the business impact is
- Ways of doing this:
  - Workshops and / or meetings (virtual or F2F)
  - By workflows, seeking views on the potential problem areas
- For priority areas, agree Business Rules which should be in place to baseline current data quality and measure data quality improvement (covered later)



The A2E Approach: Step 3 – Converge

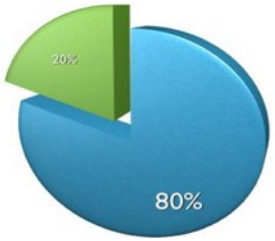
A2E Step 3: Converge

PRIORITISE & FOCUS ON SPECIFIC ISSUES & OPPORTUNTIES

- Determine initial data quality improvement projects; focus in on two things:
  - Potential pilot / proof of concept data quality improvement project(s)
  - Data quality improvement projects with the largest net benefits
- Note: these are often NOT the same thing; in the early stages of a DQ initiative it's important to establish credibility and prove the potential benefits of wider adoption via a PoC
- Work with stakeholders to identify priorities from the Data Quality Issues log
- Prioritise projects (e.g. Priority Grid)
- Run pilots / proofs of concept
- Identify and run initial DQ improvement projects

POTENTIAL OUTPUTS & TOOLS

- Prioritised Data Quality Issues Log
- Priority Grid
- Agreed pilot project(s)
- Agreed potential DQ projects
- Business cases



KEY MESSAGE:

Focus & Purpose: the Pareto Principle

80% of business benefit can often be delivered through improving the quality of **20%** of the data – concentrate on the **20%** that really matters (good candidates are often shared master data, reference data etc.)

Setting Priorities & Activities

WHY?

- Ensure clear focus & priority to manage limited time
- Important to make an early impact to gain credibility
- Need to gain support of Data Champions & Steering Group
- Build confidence & experience in DQ principles & approaches

WHAT?

- Look for 'quick wins'
- Data Quality improvement projects often a good source of quick wins as benefits easier to quantify
- Create a use case for promoting the value of the role
- Build a foundation for longer term success

HOW?

- Prioritise Issues List & agree priorities with the data stakeholders
- Specify any support (financial and / or resources) required
- Create & lead a team to deliver the improvements

WHEN?

- Don't spend too long doing analysis and reflection
- Start a pilot / PoC DQ project as the top priority
- Use the pilot / PoC to introduce DQ principles & practices
- Apply to further pilots / PoCs

Key Data Identification (1)

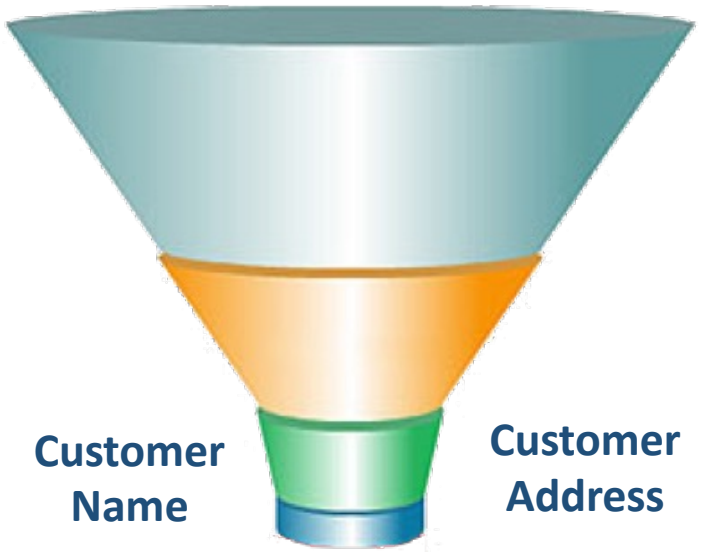
Focus on high priority data items and attributes

Identify Key Business Drivers

Filter Data Elements Aligned with Business Drivers

Focus Improvement Efforts on Key Data

e.g. Launch a New Service – Marketing Campaigns require better customer information



Targeted Projects in to Deliver Priority Improvements

Key Data Identification (2)

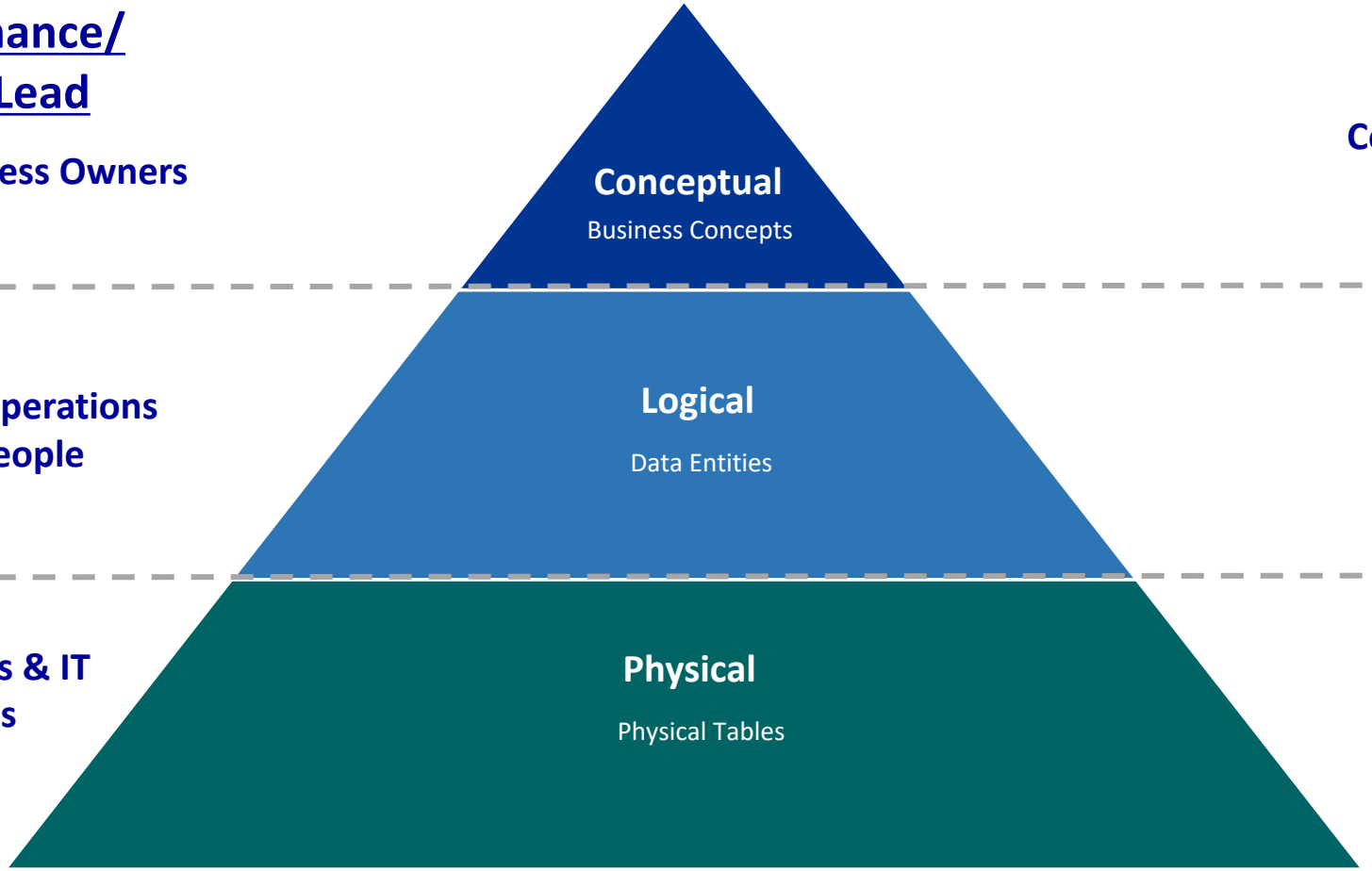
Focus on key Data Architecture entities and attributes

Governance/ SME Lead

Senior Business Owners

Purpose

Communication & Definition of Business Terms & Rules



Business Operations & IT People

Clarification & Detail of Business Rules & Data Structures

Business SMEs & IT Specialists

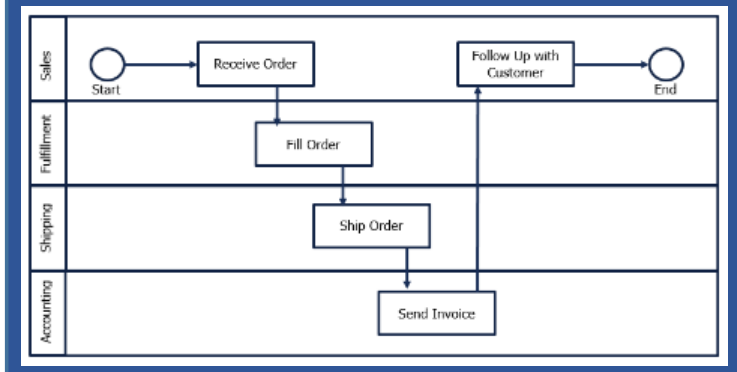
Technical Implementation on a Physical Database

Key Data Identification (3)

Analyse use of data in critical Business Processes

Modelling key business processes to the data that is Created, Updated, or Deleted (CRUD) is important in understanding data usage and helps to establish priority actions

Business Process Model



CRUD Matrix

	SALES	FULFILMENT	SHIPPING	ACCOUNTING
Receive Customer Order	C	R,U	R,U	U
Process Customer Order	C,R,U	R,U	R,U	U
Fill Order	R,U	C	R,U	R
Send Invoice	R,U		R,U	C

C - Create
R – Read
U – Update
D – Delete

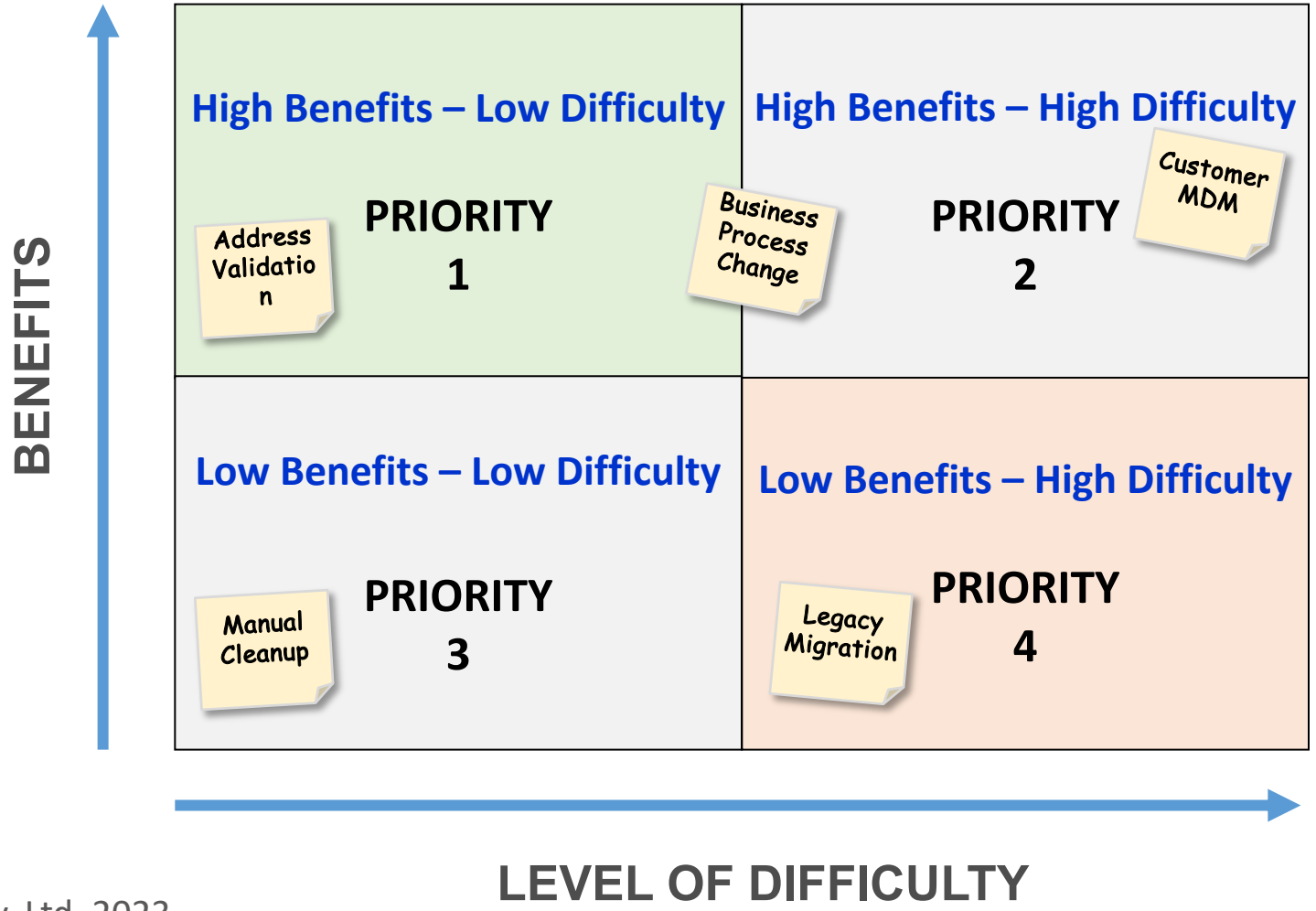
Seek Out "Quick Win" Projects

Quick Win Project: A "Quick Win" Project is a project that shows early value while at the same time building towards a long term goal. A successful "quick win":

- Aligns with business objectives and **solves a high-value business problem** *or*
- Creates a **proof of concept for a high-value business opportunity**
- Sets a **solid foundation for future efforts**
- Acts as a **"light bulb moment" for key stakeholders** to understand the value of improving Data Quality

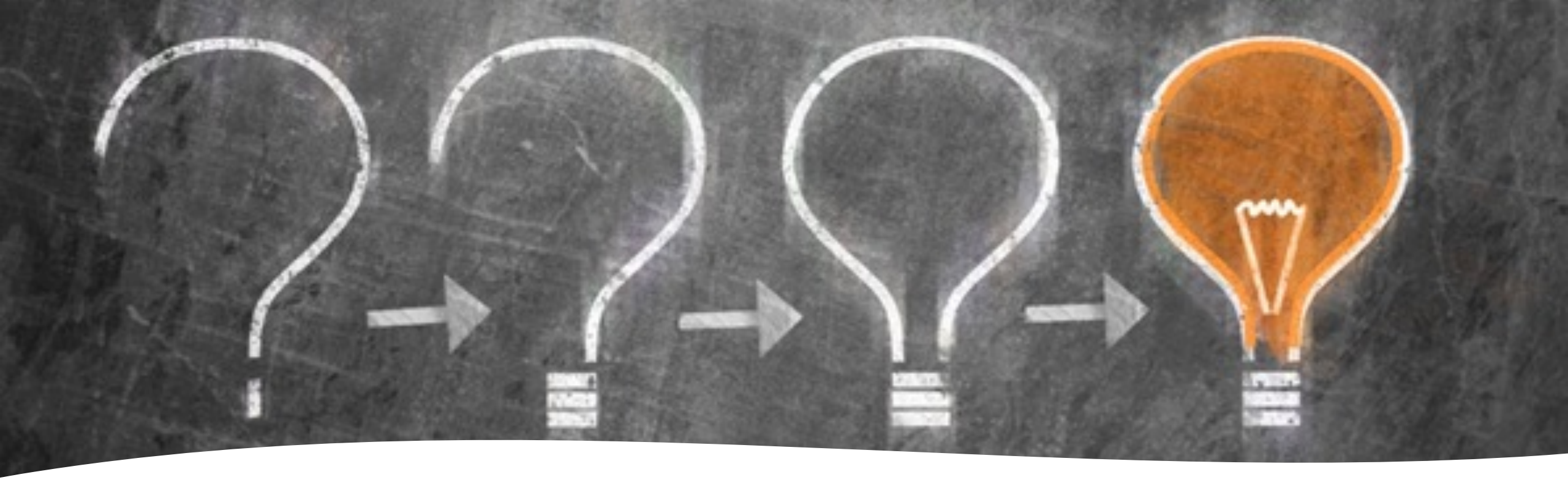
Setting Priorities: Priority Grid

- Priorities based on Benefits vs. Level of Difficulty can often be easily determined via a workshop activity using a Priority Grid.



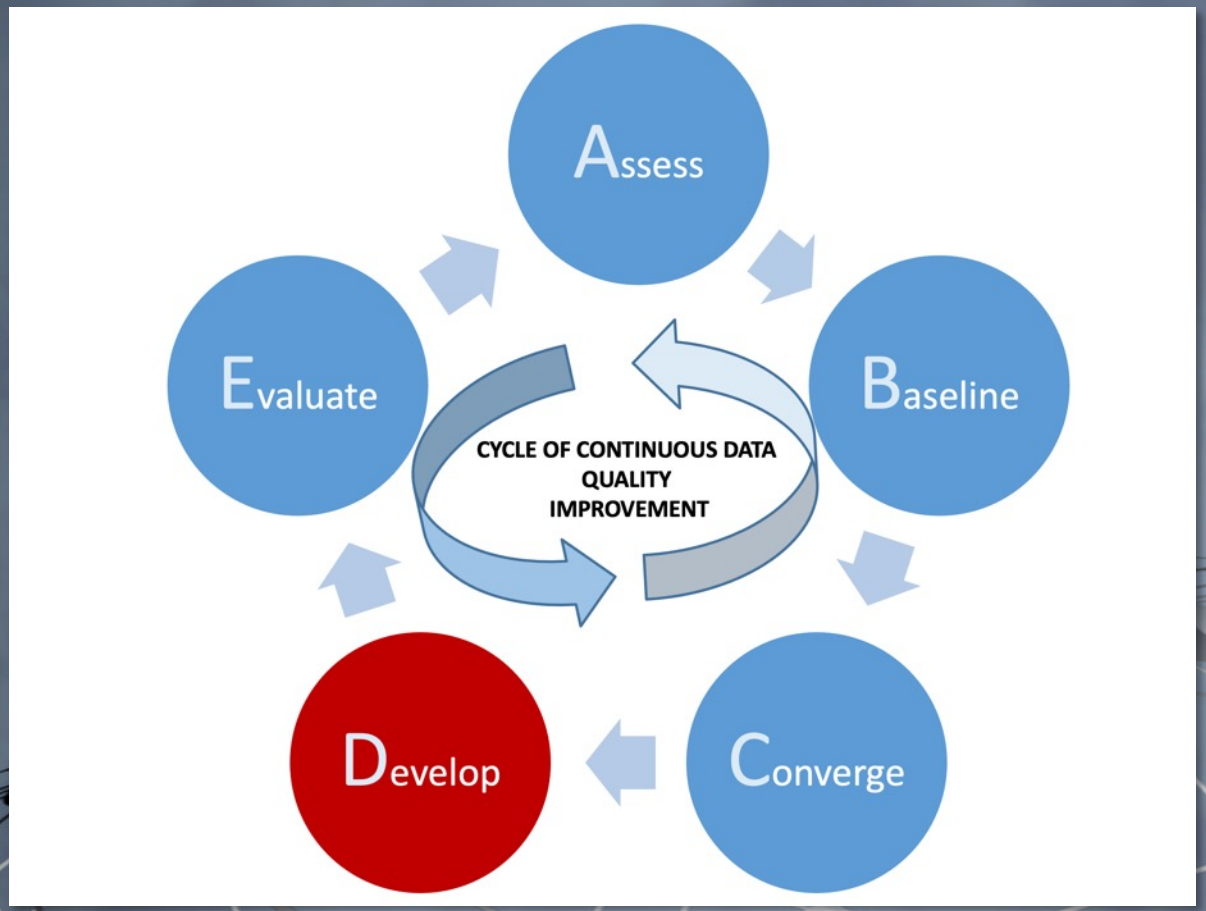
Data Issues & Opportunities Log: Suggested Template

ID	Short Name	Brief Description	Impact of the Problem / Potential Opportunity (Business & IT)	Raised By	Boston Grid Priority Score (*) 1 – High Benefits / Low Difficulty 2 – High Benefits / High Difficulty 3 – Low Benefits / Low Difficulty 4 – Low Benefits / High Difficulty
1	**Customer Data Duplication**	Both in the CRM platform and the Customer Data Warehouse there are known customer record duplications, mainly caused by marketing and sales people not being able or willing to search for an existing customer record. One estimate is that up to 25% of CRM customer records are duplicates. Data Warehouse duplication unknown.	• Multiple marketing communications sent to the same customer, causing brand damage • Inability to evaluate total customer lifetime revenue value • Impossible to derive a single view of a customer • Risks contravening GDPR if customer submits Data Subject Access Request (DSAR) and all data not returned • Resolving this problem would accelerate MDM ambitions and enable better targeted 1-1 customer marketing	• Bob Mills (Marketing Manager) • Anna Ford (CRM Technical Architect) • George May (Senior Sales Rep)	2 (Though conducting an initial data cleanse of the CRM platform may be a 1 – further investigation required)
2					
3					



ACTIVITY

- Have you already identified any potential ‘quick win’ Data Quality projects in your organisation?
- Could you identify potential ’quick wins’ that you could progress on your return?



The A2E Approach: Step 4 – Develop

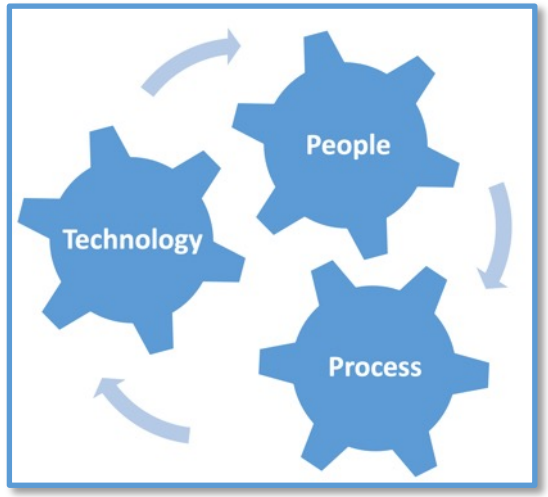
A2E Step 4: Develop

DESIGN & IMPLEMENT IMPROVEMENTS

- Create data quality improvement team to include:
  - Business stakeholders (Data producers, consumers and others, e.g. process owners)
  - IT stakeholders – SMEs, DBAs etc.
  - Other specialists as required (e.g. Data Protection Officer if Personal Data involved)
  - Note: It is important to align with Data Governance Initiatives & Roles (e.g. Data Owners, Data Stewards)
- Re-analyse current problems
  - Perform root cause analysis
- Design and implement improvements
  - Design and implement changes
  - Identify Business Rules & set data quality KPIs
  - Measure improvements against KPIs
  - Revisit the business case to log benefits
  - Identify future improvements
  - Produce case study

POTENTIAL OUTPUTS & TOOLS

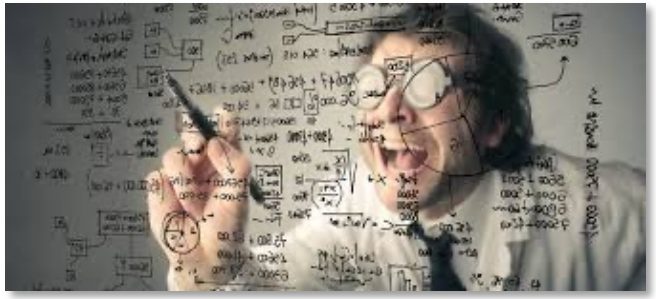
- Root Cause Analysis diagrams
- Updated business cases & case study
- Data Quality KPIs and thresholds based on the 7 Data Quality Dimensions and identified Business Rules
- Data Improvement Plans



Creating Data Quality Working Groups: Getting Wider Engagement & Collaboration

De Facto (Maybe Unrecognised) Data Owners / Stewards etc.

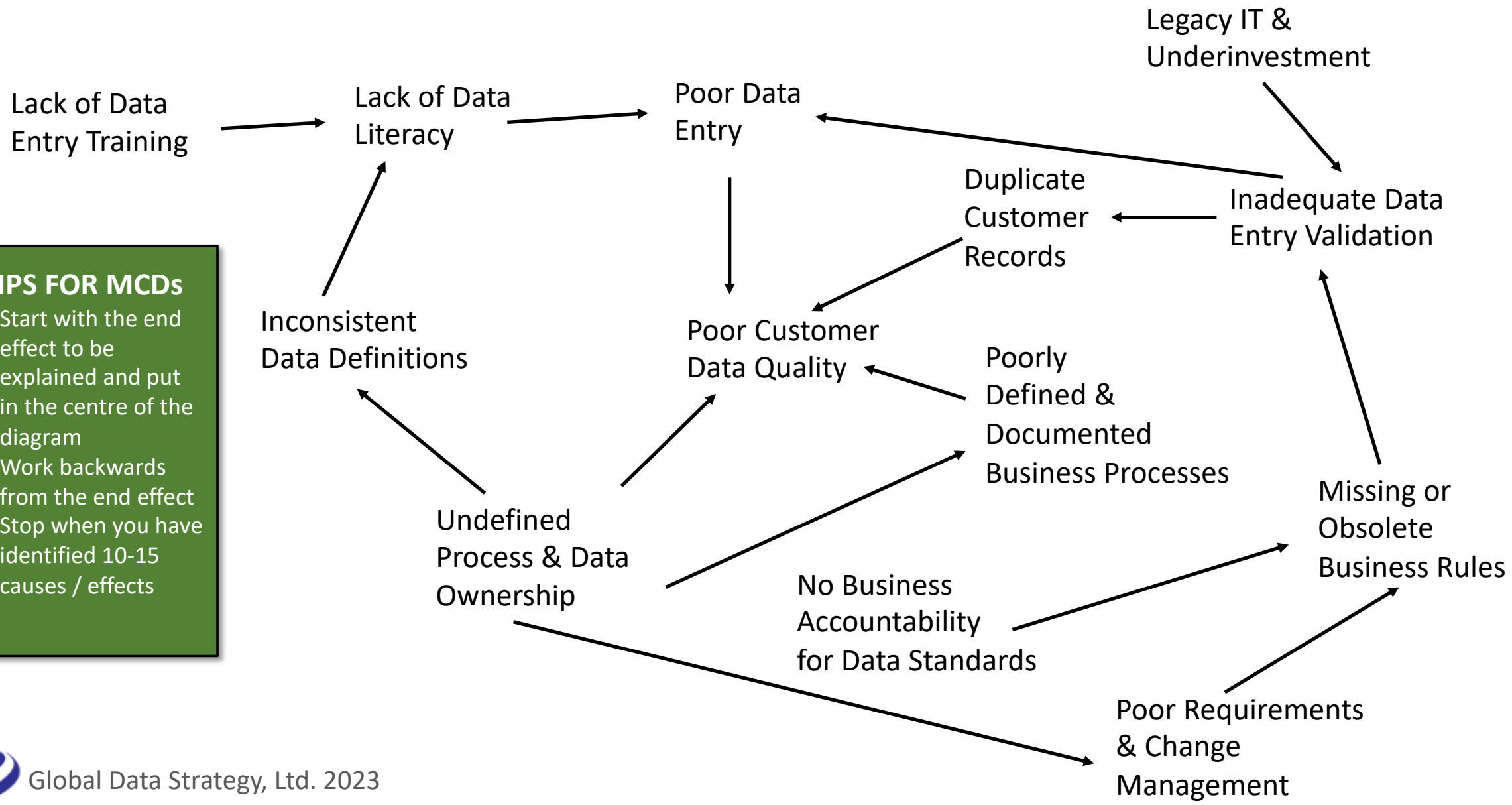
People Who Feel the Pain of Poor Data



Data Domain Experts / Geeks (The 'Go To' person)

Enthusiasts Seeking a New Challenge

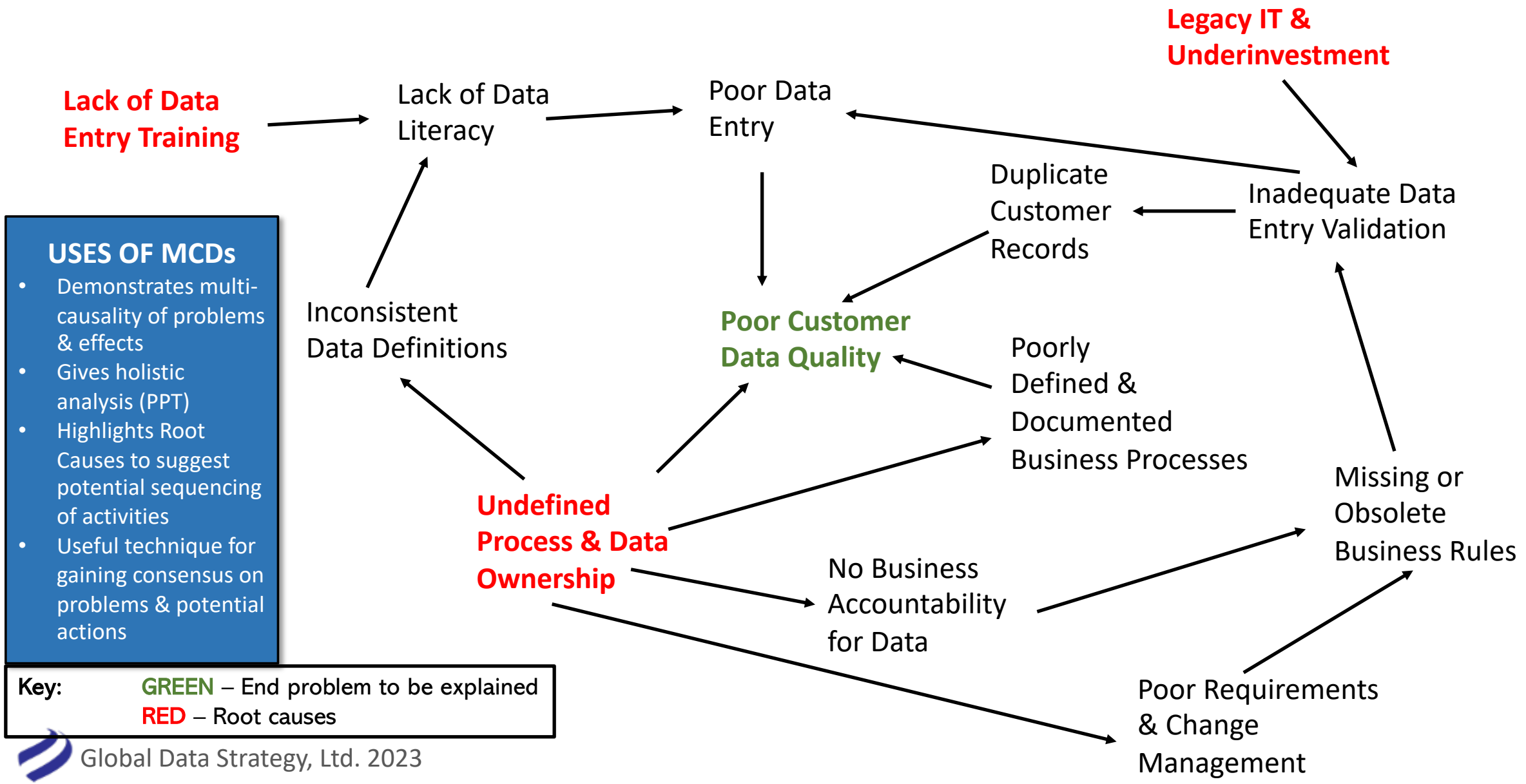
Multiple Cause Diagrams (Root Cause Analysis) – Example



TIPS FOR MCDs

- Start with the end effect to be explained and put in the centre of the diagram
- Work backwards from the end effect
- Stop when you have identified 10-15 causes / effects

Multiple Cause Diagrams (Root Cause Analysis) – Value



USES OF MCDs

- Demonstrates multi-causality of problems & effects
- Gives holistic analysis (PPT)
- Highlights Root Causes to suggest potential sequencing of activities
- Useful technique for gaining consensus on problems & potential actions

Key: GREEN – End problem to be explained
RED – Root causes

The Importance of KPIs

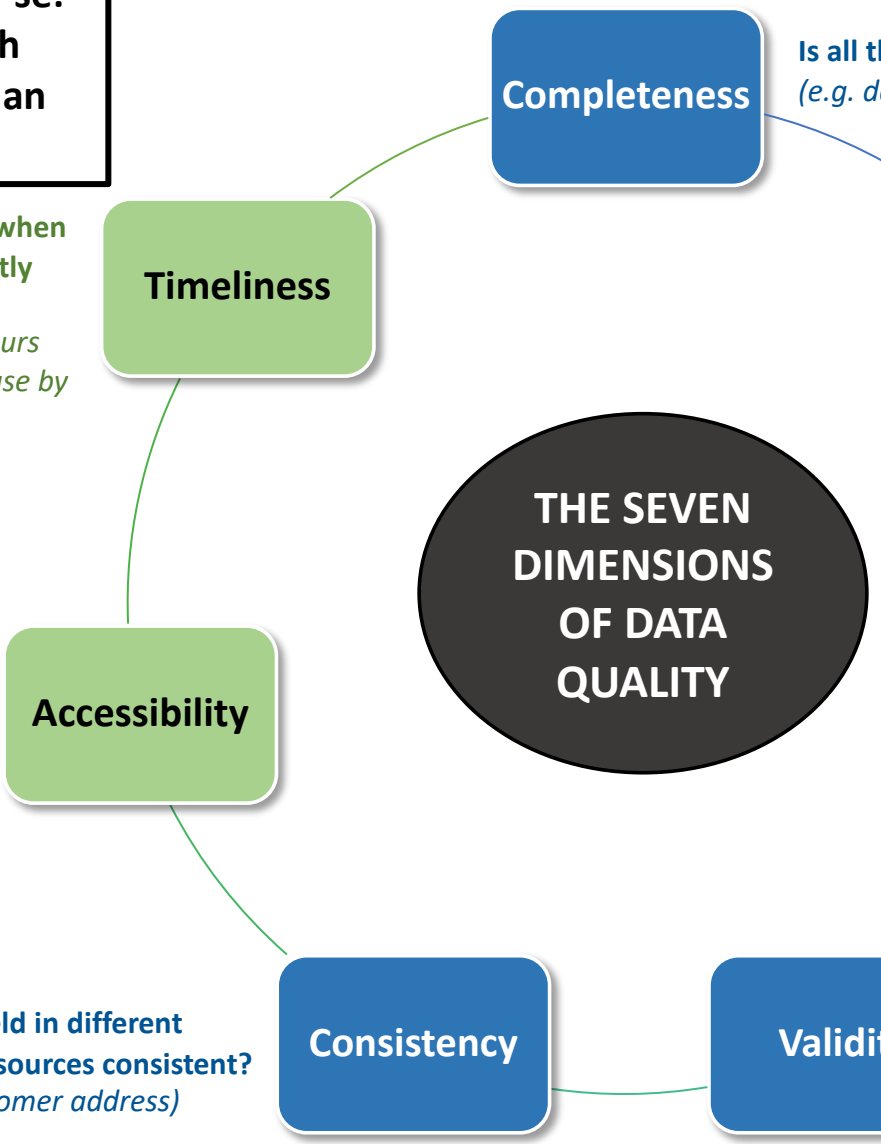
"You Can't Manage What You Can't Measure"

- Most businesses set strategic goals they desire to achieve and measure these goals against Key Performance Indicators (KPIs).
  - These KPIs provide a concrete, objective way to measure progress towards these goals
- To use Finance as a comparison, they have a number of KPIs they use to manage **financial assets**
  - Revenue Projections
  - Budget Goals & Limits
  - Expense Ration, etc.

- We need to do the same with **data assets**
  - % complete
  - % accuracy
  - Timeliness
  - RoI
  - Cost Savings

Baselining & Setting KPIs: the 7 Dimensions of Data Quality

You cannot measure DQ per se: you need to measure each dimension and roll up into an overall DQ measure



Completeness
Is all the required data present?
(e.g. date of birth in a DoB field)

Accuracy
Does the data reflect the real world?
(e.g. current customer address)

Uniqueness
In a data source, is the entry unique or are there unintended duplicate records?
(e.g. same client organisation spelled several different ways in multiple CRM records)

Validity
Does the data conform to a specified or expected format and / or business rule?
(e.g. date of birth as DD/MM/YYYY; age between 18 and 120 years)

Consistency
Where data is held in different sources, are the sources consistent?
(e.g. current customer address)

Accessibility
Do the users who need to use the data have access to it?
(e.g. Finance team and invoice data held in data warehouse)

Timeliness
Is the data available to users when they need it and is it sufficiently timely to meet their needs?
(e.g. invoices sent in last 24 hours available on the data warehouse by 9am the next day)

Key:

CONTENT DIMENSIONS

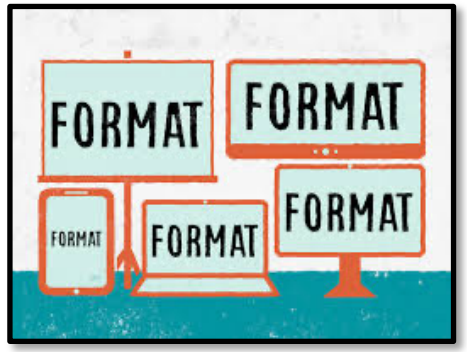
CONTEXT DIMENSIONS

Data Improvement: The Importance of Business Rules

"A Business Rule is a criterion used to guide day-to-day business activity, shape operational business judgments, or make operational business decisions."

Ronald Ross, quoted in architectureandgovernance.com

- In a data context, business rules are used to define and enforce the standards that data must conform to
- Therefore have a key role in assessing, baselining and improving data quality
- Are used to specify data design, e.g. drop down lists, data input validation etc.
- A simple typology of Business Rules as applied to data is:
  - **Format business rules** – specify the format standards data should comply with
  - **Content business rules** – specify the allowable content of records or fields



Example Data Related Business Rules

FORMAT RULES

- A UK National Insurance Number must be in the format: aa nn nn nn a
- An employee must have a unique Employee ID in the format: aa nnnn
- Date of birth should be in North American format of MM/DD/YYYY
- A full US zip code must be in the format nnnnn-nnnn
- Internet router identifier must be in the format Aaa_Nan_Naa

CONTENT RULES

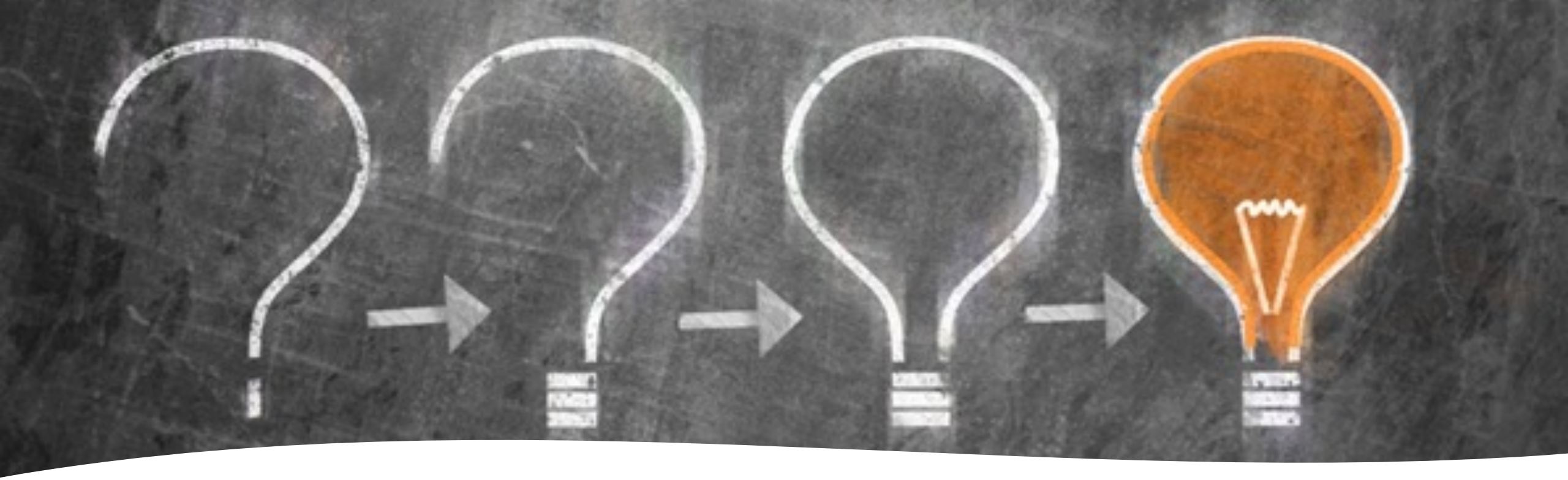
- Every Sales Representative must be assigned to one and only one Sales Region
- A valid email address must be entered by a customer to enable a customer's order to be accepted
- Gender codes must have the valid value of Male, Female or Unknown
- A supplier must have at least one associated geographical address
- Product Price should be Product Unit Cost + 25%

How Do You Identify Business Rules?

- Business rules can be discovered or derived from:
  - Data models (Business / Logical / Physical)
  - Business documentation (e.g. Process Descriptions, User Instructions)
  - IT Documentation (e.g. requirements specifications, system manuals)
  - Source code (e.g. If 'A Then B' statements)
  - Master and / or Reference Data Sources (e.g. currency codes, product master data)
  - Documented metadata (e.g. Business Glossaries, Data Dictionaries, Metadata Repositories)
  - Data profiling outputs
  - **Talking to key stakeholders**:
    - Data owners and data stewards (if in place)
    - Data producers and consumers
    - Other business and IT subject matter experts

VITAL IMPORTANCE OF STAKEHOLDER ENGAGEMENT:

- Business rules are frequently implicit (i.e. locked in people's heads) and not formally documented
- Where business rules are documented, documentation is often out of date and not updated in line with system changes



ACTIVITY

Referring back to the HR data source sample earlier, specify:

1. 3 Format Business Rules
2. 3 Content Business Rules

that can be used to create and enforce ‘fit for purpose’ data improvement on this data source

ACTIVITY – Extract of actual HR data source

EMPLOYEE NO	SURNAME	FIRST NAME	GENDER	DATE OF BIRTH	ROLE CODE
802540	Smith	Brian	Female	31/01/56	PM16
YN4176B	Gregg		Male	07/09/80	9999
811609	Patel	Priya	XXXX	25/12/78	AL60
22298	Bothroyd	Bridget	Female	28/08/09	TBD
802540	Smith	Bryan	Male	31/01/56	PM10
855265	Hayes	Leslie	Female	00/00/00	AL76
	Taylor	Kevin	Unknown	12/30/69	US18

Key:

Potential Data Quality Problem

Potential Duplicate Record

Using Business Rules to steer and enforce Data Quality standards

EMPLOYEE NO	SURNAME	FIRST NAME	GENDER	DATE OF BIRTH	ROLE CODE
802540	Smith	Brian	Female	31/01/56	PM16
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	Taylor	Kevin	Unknown	12/30/69	US18

Example potential format business rules	Example potential content business rules
Employee No. must be in format nnnnnn. Blank Employee Numbers are only allowed if new starter is awaiting Emp. No. allocation	Employee No. should be unique. Only one Employee No. should be allocated to any individual employee
First Name must not be blank	Gender should align with First Name derived from Common Names Reference file
Date of Birth must be in format nn/nn/nn	Allowable Genders are FEMALE, MALE, SELF-DETERMINED or UNKNOWN
Role code must be in format AAnn	Date of Birth must be expressed as DD/MM/YY and in the range 01/01/1940 to 12/12/2006

Deploying Business Rules - Approaches

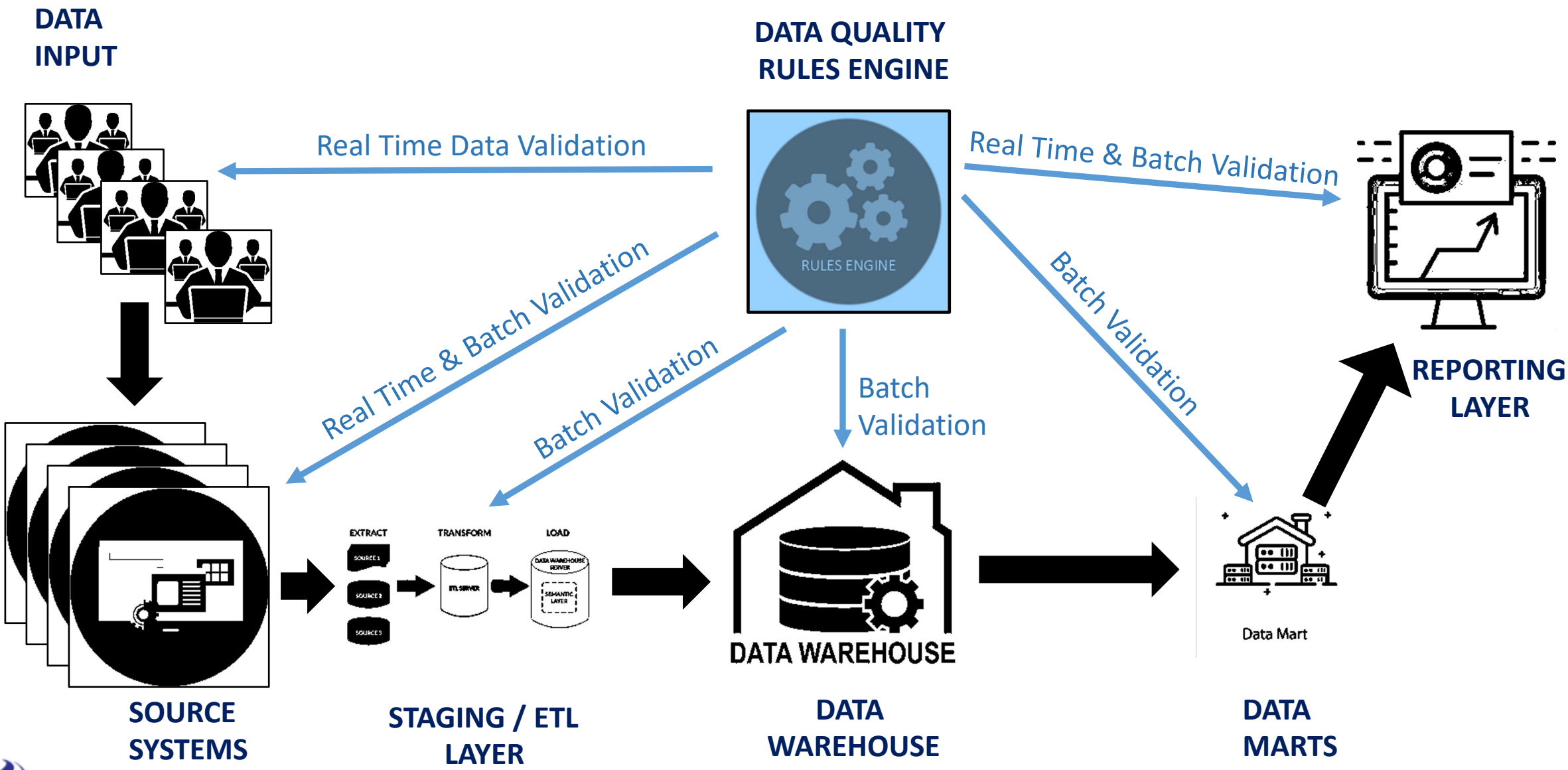
Data Entry Guidelines, Business Glossary & Training

Master & Reference Data Management

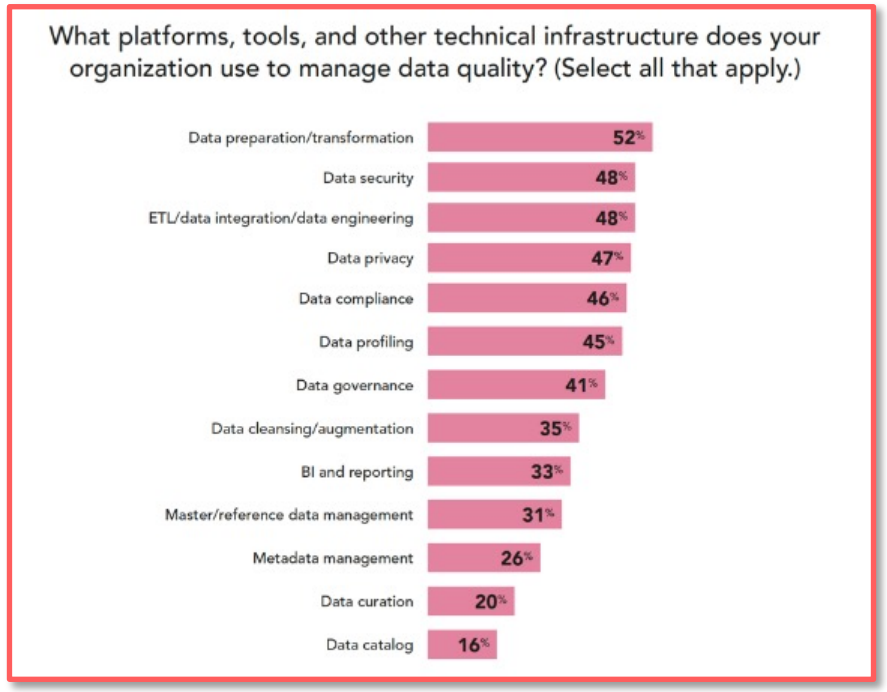
Application Code (e.g. data input validation)

Data Quality Tool: DQ Business Rules Engine

Step 3: Automating Data Quality Business Rules via a DQ Rules Engine



Use of Tools & Technology in Data Quality Management



Headline Findings:

- Tools and technologies are increasingly being acquired and used to support data quality management
- Strong focus on Data Preparation & Transformation reinforce finding that analytics and intelligence are key drivers for better data quality management
- Although only 16% currently have an enterprise wide data catalog, 45% intend implementing one within the next 12 months

Tools enable:

- *Profiling*
- *Monitoring*
- *Parsing*
- *Standardising*
- *Matching*
- *Merging*
- *Cleansing*
- *Correcting*
- *Enhancing*
- *Management of data quality rules*
- *Data quality workflows*
- *Data quality reporting*

Source: 2022 State of Data Quality, TDWI, James Kobielus
Available for download at https://globaldatastrategy.com/resources/white-papers/

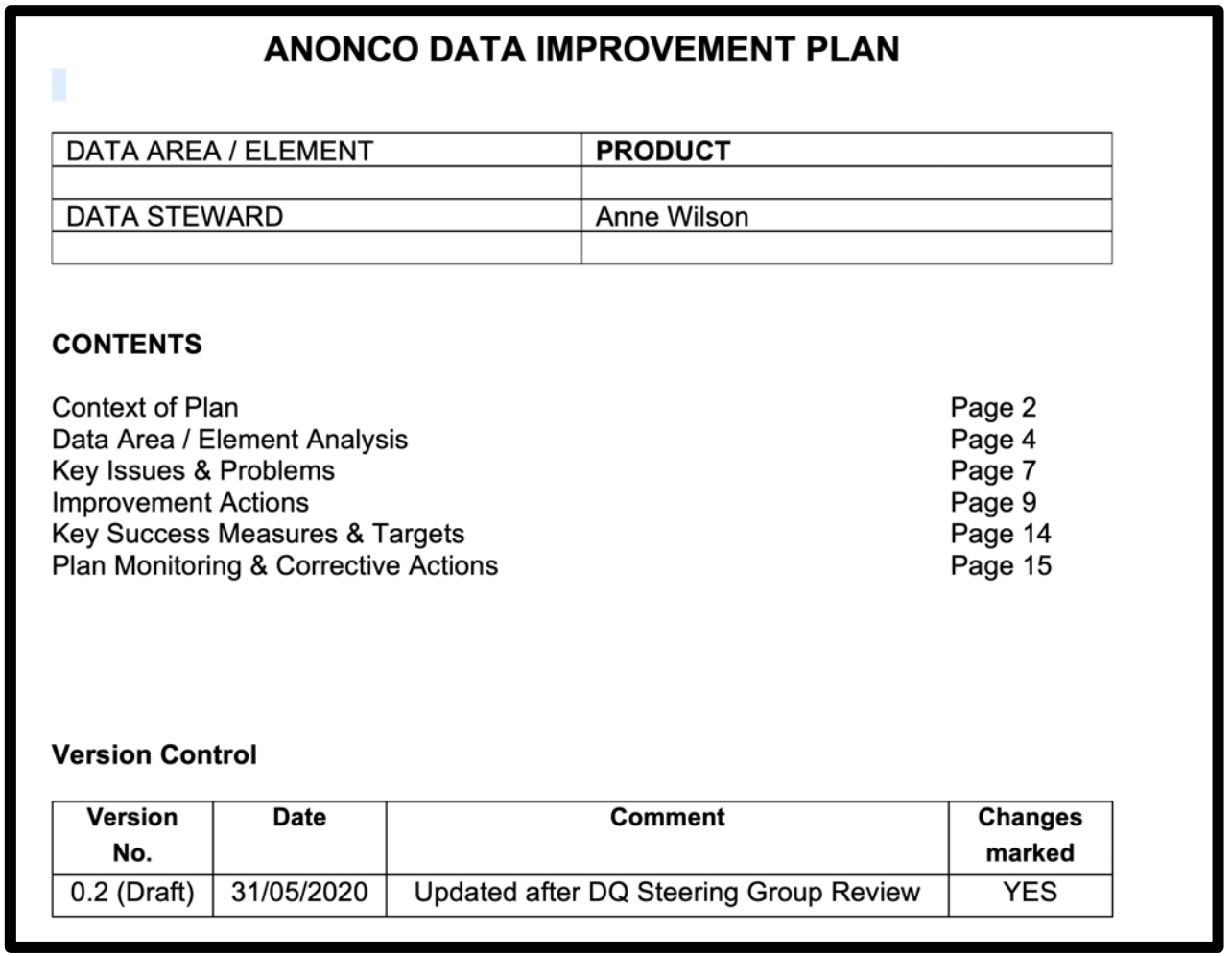
Data Improvement Plan

A Data Improvement Plan is a formal plan to specify and manage improvements to a specified data domain and / or data problem area

The benefits of a Data Improvement Plan are that it:

- Sets out goals and expectations for data improvement
- Acts as a focal point for all data improvement activities
- Prioritises improvement activities
- Can be used to track improvements and communicate successes
- Can evolve to align with the changing needs of the business

Data domain DIPs can be rolled up to form the core of a company wide Data Quality Improvement Program



ANONCO DATA IMPROVEMENT PLAN

DATA AREA / ELEMENT	**PRODUCT**
DATA STEWARD	Anne Wilson

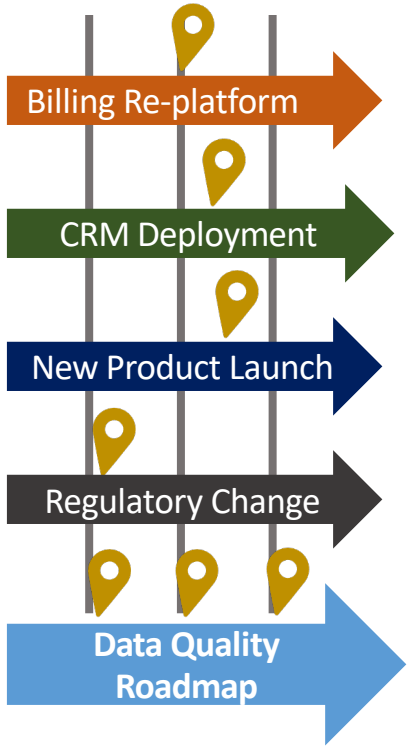
CONTENTS

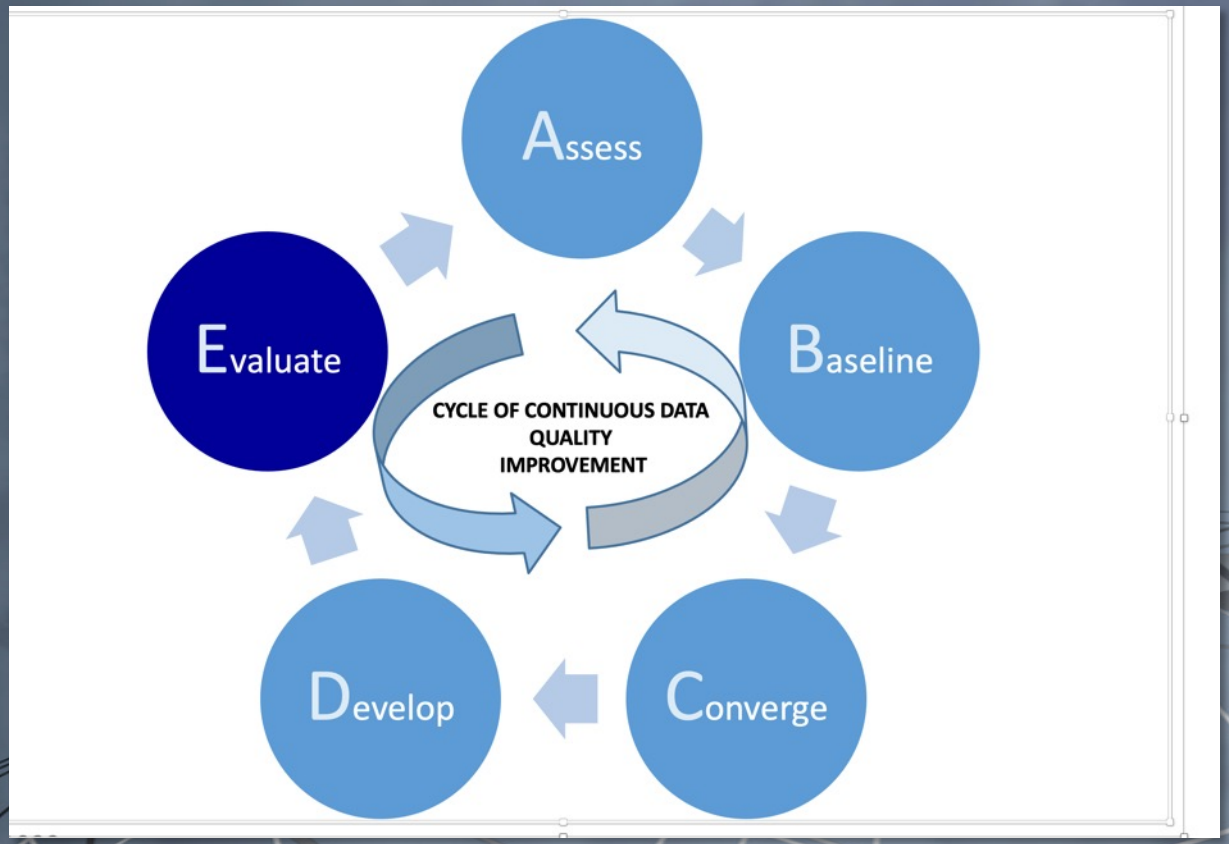
Version Control

Version No.	Date	Comment	Changes marked
0.2 (Draft)	31/05/2020	Updated after DQ Steering Group Review	YES

Align your Data Quality Roadmap with other relevant Roadmaps

- When managing your Data Quality Roadmap, it's important to engage and align with other Roadmaps being developed
  - Will the existing Data Quality Roadmap deliver benefits that support the development of other Roadmaps? For example:
    - Billing Re-platforming project
    - CRM system deployment
    - New product launch
    - Regulatory change
  - Do you need to adapt your Data Quality Roadmaps to better support other Roadmaps?
  - Are there existing communications you can leverage to promote your Data Quality Roadmap?





The A2E Approach:
Step 5 – Evaluate

A2E Step 5: Evaluate

EVALUATE & SUSTAIN GAINS

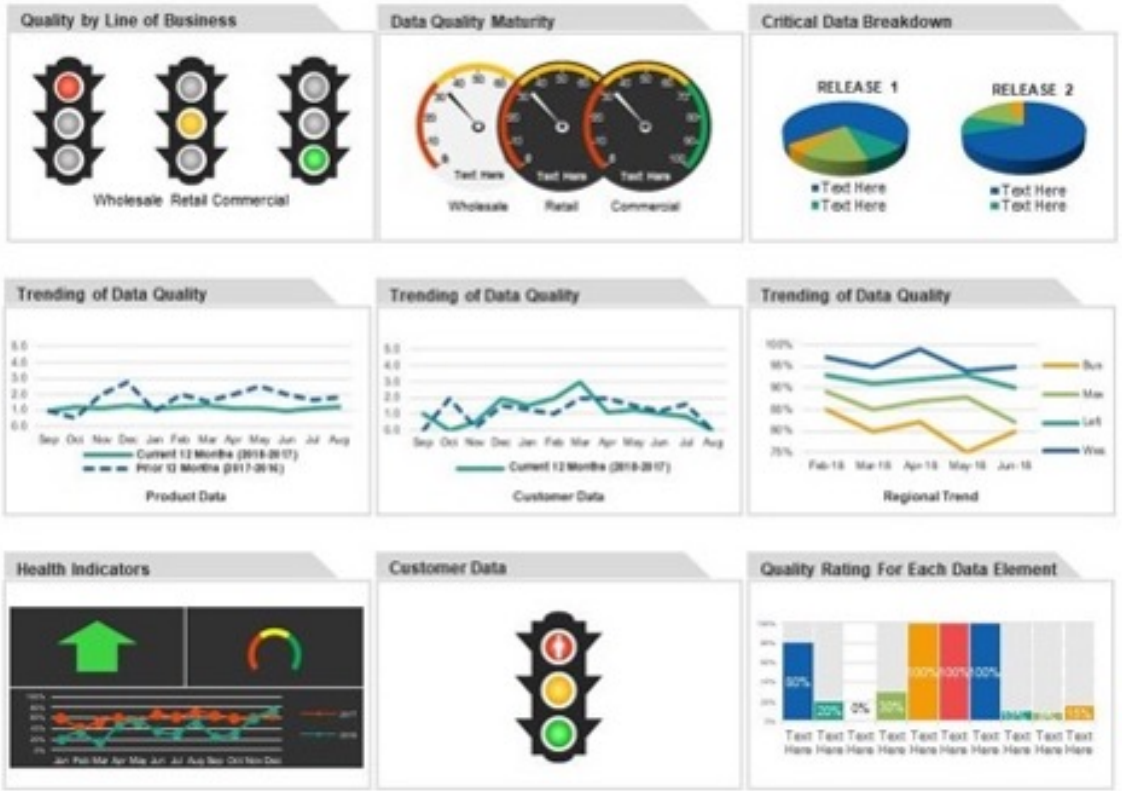
- Embed Data Quality improvement as a business as usual activity
- Evolve Data Quality improvement teams into wider Data Governance structure:
- Track Data Quality improvements via Data Quality Dashboards
- Monitor financial and business benefits over time
- Evangelising benefits – part of your job is marketing!

POTENTIAL OUTPUTS & TOOLS

- Evolving & incremental Data Improvement Plans
- Formal Data Governance Roles in place for targeted data areas
- Regular Data Quality Dashboard updates and analysis
- Business Process Change
- Continued RoI and financial benefits
- Communication Plan and Organisational Change Efforts

Monitor & Report Business Rule Adherence

- When Business Rules are implemented can be used to:
  - Check continued adherence of existing data
  - Enforce the rules on new data to prevent new problems
- Best monitored via Data Quality Dashboards
  - Provide regular reports on adherence of data to Business Rules
  - Set KPIs to drive continuous data improvement
  - Identify data quality trends
  - Highlight areas where corrective action required
  - Indicate where / if Business Rules may need to be amended to meet changing business needs
- When reporting always try to relate data quality to business outcomes
  - Address the 'so what' objection
  - Puts a financial or other benefit on continued data quality improvement

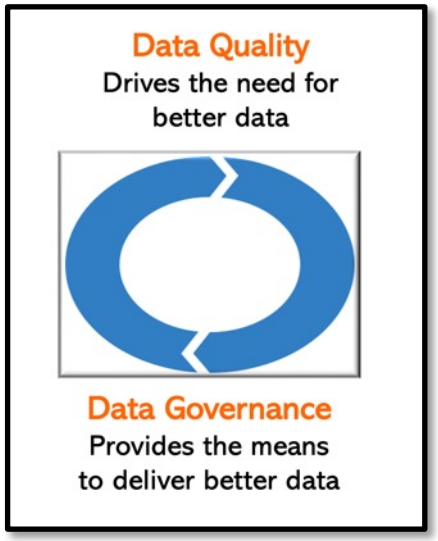


Data Quality Dashboard

Data Governance & Data Quality: the synergies

- Data Quality improvement is a primary reason why many organisations implement data governance:
  - Realise that Data Quality is a business problem and not an IT problem
  - Recognise that Data Quality improvement cannot be sustained without business leadership
  - Have learnt that Data Quality is NOT a synonym for data cleanse; data cleanse is a repeated cost of failure and usually does not remove the root causes of poor Data Quality
  - Data is volatile and so Data Quality has to be a perpetual business as usual activity enabled through data governance

- Better Data Quality is usually a very effective way of demonstrating the value of Data Governance:
  - Enhanced Data Quality can deliver 'quick wins'
  - The benefits of reducing the 'costs of failure' caused by poor Data Quality can be significant & measurable
  - A sound Data Quality foundation enhances the value & success of other data management investments (e.g. Business Intelligence, Data Science, Analytics, CRM et al)



Typical Key Data Governance Roles

Executive Sponsor

- Promotes Data Driven Culture
- Champions Best Practices
- Advocate with ELT and Board
- Escalation Point for Key Issues

Data Owner

- Represents the data needs for a particular functional area
- Defines key KPIs & data elements
- Defines key business rules
- Sanctions Data Quality Metrics & Thresholds

Business Data Steward

- Responsible for the day-to-day management and quality of data
- Subject Matter Expert (SME) for a given business domain
- Aligns with the Lead Data Steward to support business rules and to align with key KPIs

Technical Data Steward

- Digital/IT expert for a given business unit
- Subject matter expert for a given system and its usage
- Aligns with Business Data Stewards to ensure technical needs are met

Data Governance Lead*

- Acts as a cross-functional lead for the data governance effort, working with both business and IT roles
- Chair of the Data Governance Steering Committee

Data Architect*

- Oversees the holistic data architecture for the organisation, including data models, data standards, data integration, etc.
- Works with both business and technical stakeholders to ensure that systems implementations align with key business rules & needs

Data Security Lead*

- Ensures that the organisation adheres to the adequate security standards to support industry regulations and best practices
- Works with the Data Governance Lead and Data Architecture to ensure that data implementations support business needs in a secure way.

* Typically a full-time role

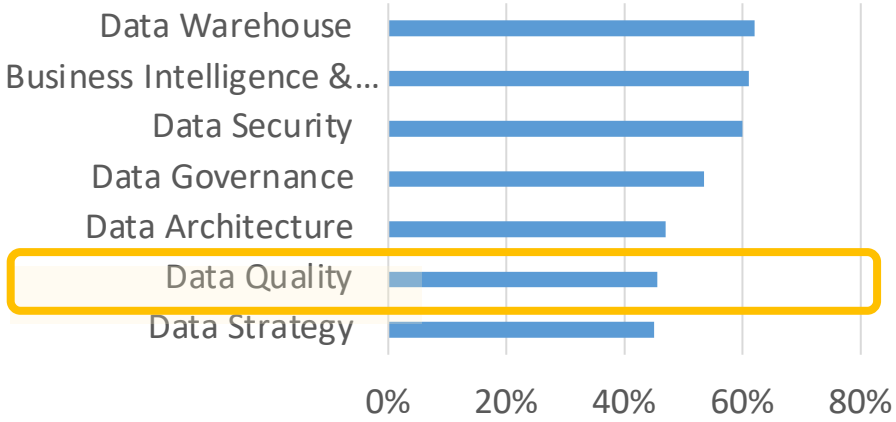
The A2E Approach: Summary Benefits

- Views Data Quality as a holistic problem requiring holistic solutions:
  - People, Process, Technology
  - Supports incremental and continuous data quality improvement
- A reusable methodology that can be applied at multiple organisational levels:
  - Organisation
  - Function (e.g. Finance, Order Fulfilment etc.)
  - Department (e.g. Sales, Marketing, HR etc.)
  - Data Domain (e.g. Customer, Product, Billing)
  - Specific Data Quality Issue (e.g. missing contact data in CRM platform)
- Identifies focus and priority:
  - Identifies 'quick wins' to accelerate momentum
  - Ensures resources are targeted at highest priority problems

Data Quality: The Future

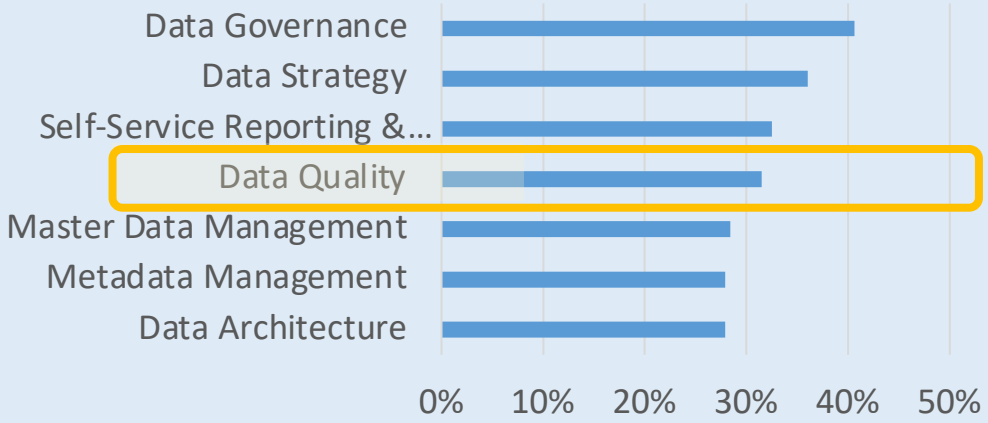
Data Quality Remains a Growing Priority

Data Priorities in Place for 2021



Data Quality is #6

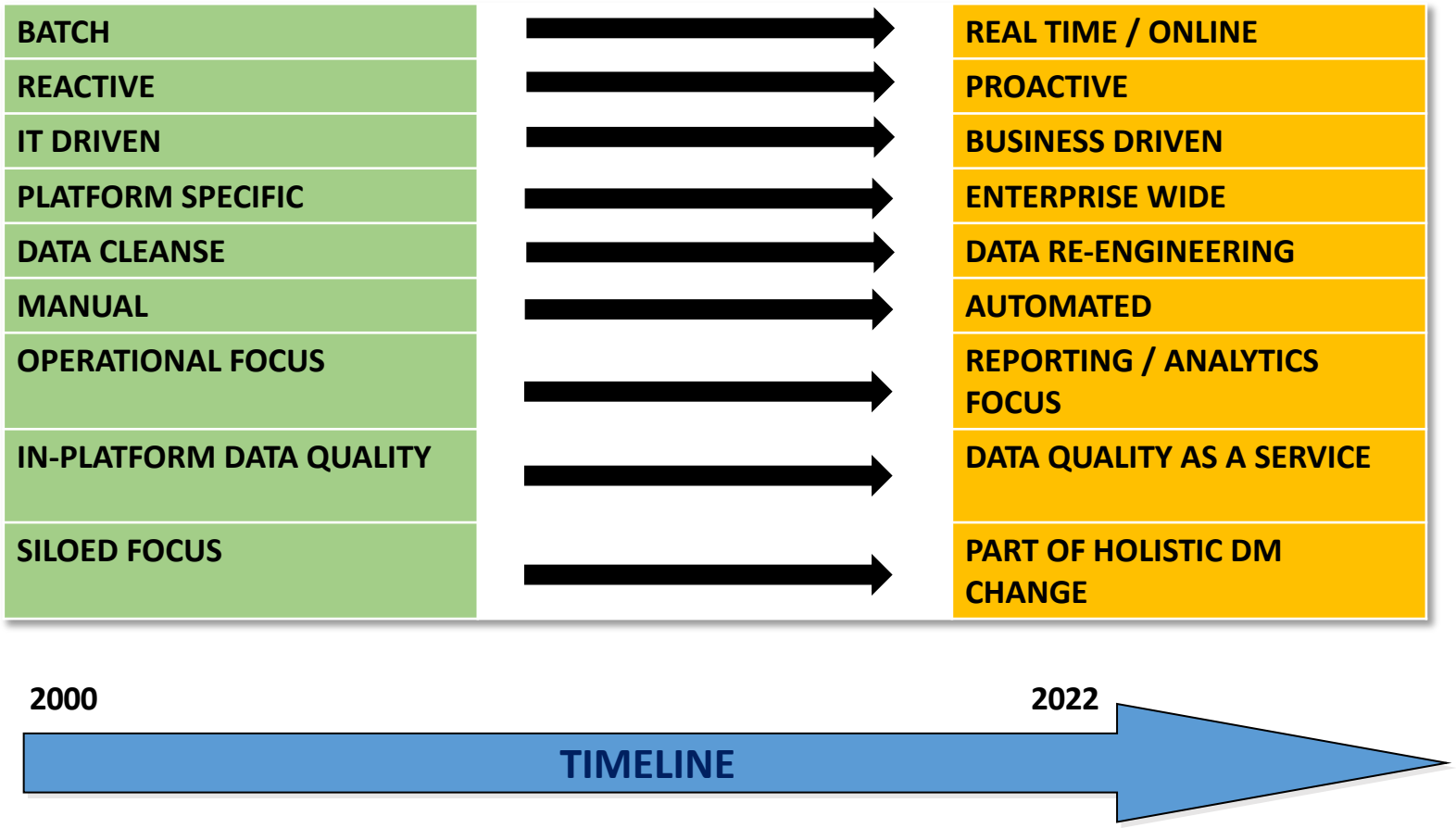
Future Data Priorities in 2022-2023



Data Quality is #4

From the 2020 DATAVERSITY survey on "Trends in Data Management", by Donna Burbank & Michelle Knight
Available for download at: https://globaldatastrategy.com/resources/white-papers/

Evolution of Data Quality since 2000…
Evolving Approaches

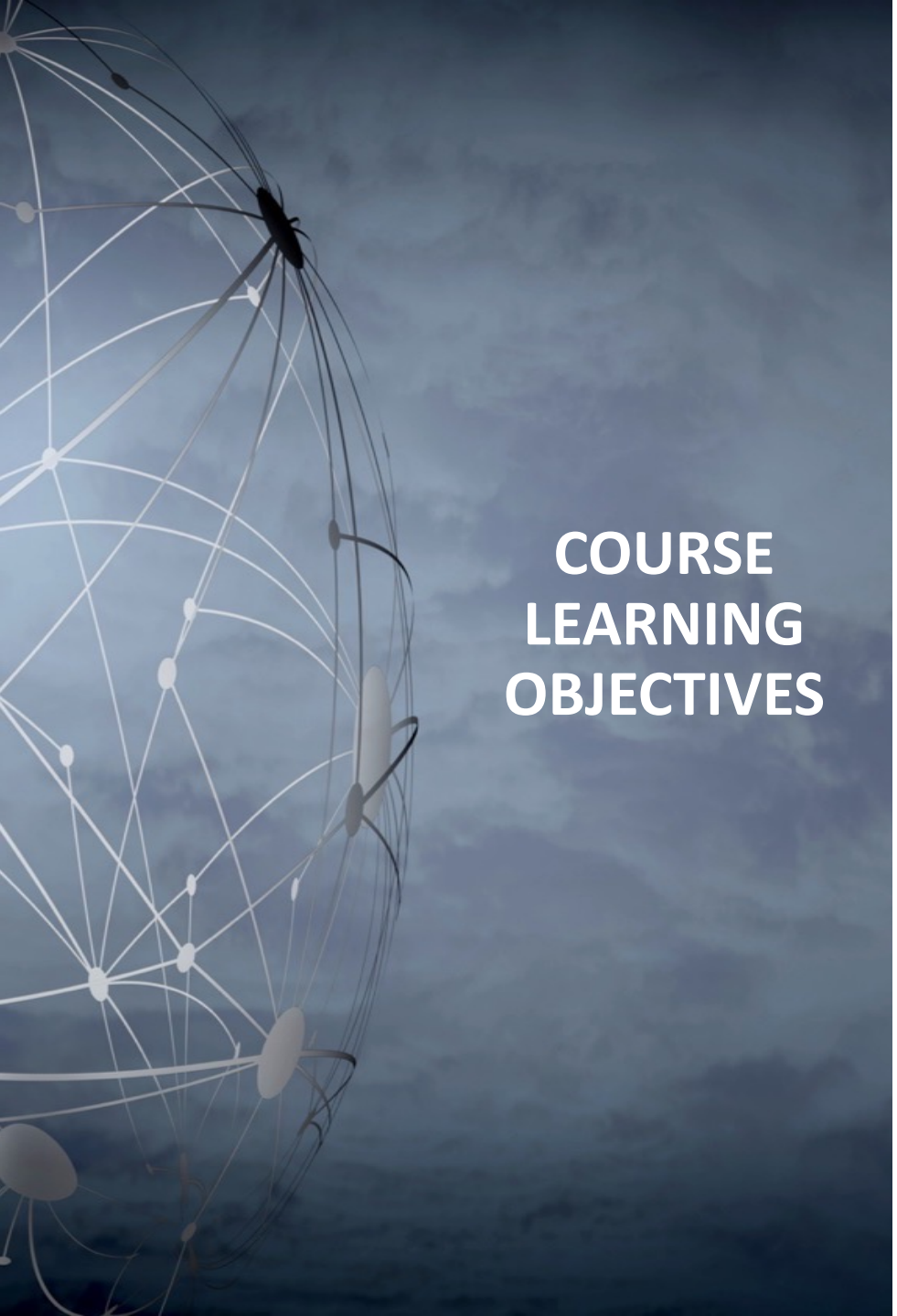


The Future of Data Quality

New approaches for data quality in digital organisations

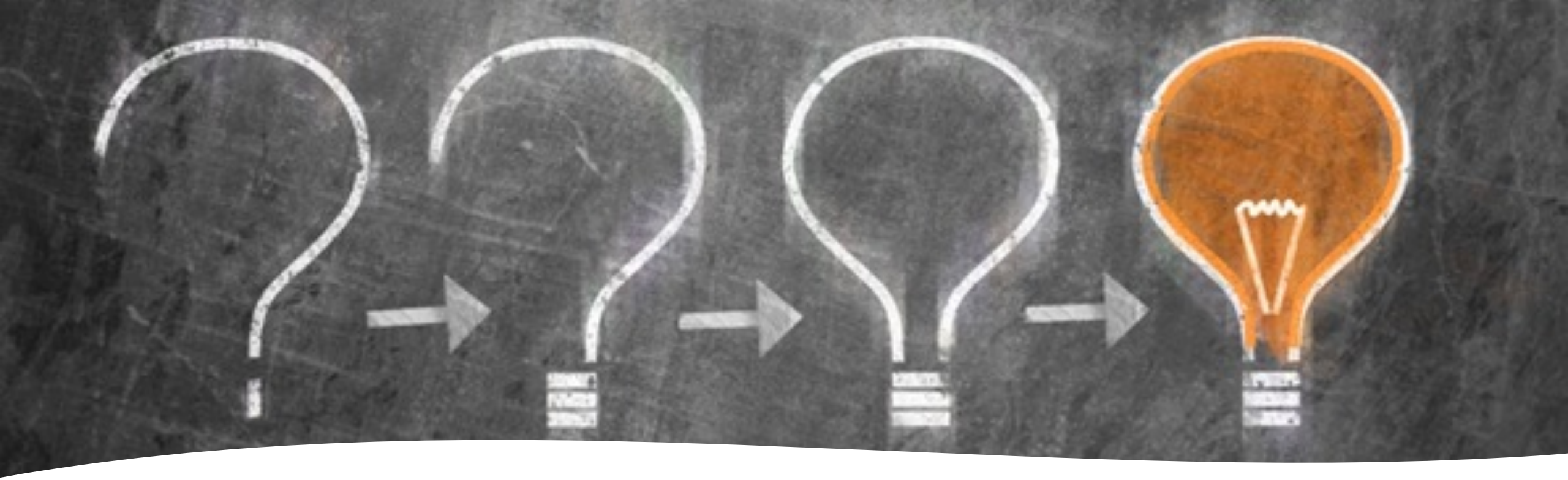
- **Increased focus on real time data validation** and improvement at the point of data creation, ingestion or use:
  - Automated digitised processes and self-service will fail if the data is not fit for purpose
  - Data validation and improvement must be done in real time on large data volumes & varieties
  - 'After the fact' data cleanse and improvement is now too late
  - Opportunity to exploit IoT and AI to develop self-checking data quality capabilities through machine learning to:
    - Automate and validate data entry
    - Identify duplicate records
    - Detect data anomalies
    - Fill data gaps
    - Match data
- **Business users need more control** over the creation & management of business rules
  - They need the ability to create business rules dynamically when preparing data
  - The paradigm where business rules are created and held centrally by IT is obsolete
- **End user self-service data quality** functionality is essential:
  - Data preparation & formatting
  - Data parsing & cleansing
  - Data enhancement & enrichment

Summary & Conclusions



COURSE LEARNING OBJECTIVES

- Understand what ‘fit for purpose’ data is, and is not
- Describe the dimensions of data quality
- Know the main causes of poor data quality
- Highlight the impact of poor data quality on individuals and organisations
- Understand the relationship between data quality and other data management disciplines, with particular emphasis on data governance
- Highlight the shortcomings of traditional ways of tackling poor data quality and the importance of a holistic approach, involving people, process and technology
- Learn the five steps of the A2E methodology and how to apply it to identify, prioritise and address data quality problems
- Specify and apply the main activities and deliverables of each of the five steps
- Be able to understand and develop business rules to baseline data quality and to set improvement thresholds
- Be aware of software tools that can help to support and automate the A2E approach



DISCUSSION

- How well do you feel the course has met its stated objectives?
- How well have your personal objectives been met?

Summary & Conclusions

- Data quality is complex because **businesses and organisations are complex**
- Addressing data quality issues requires a **holistic approach combining people, process, and technology change**
- Data governance is needed to sustain data quality improvement **– it orchestrates the people, processes and organisational structures** required to improve data quality
- Build quantifiable Data Improvement Plans to **show demonstrable RoI and implement a culture of continuous data quality improvement**
- It's vital to **deliver frequent incremental improvements** to maintain business interest and backing
- Data quality is a multi-dimensional issue for organisations so **tackle it through multi-dimensional approaches such as A to E**

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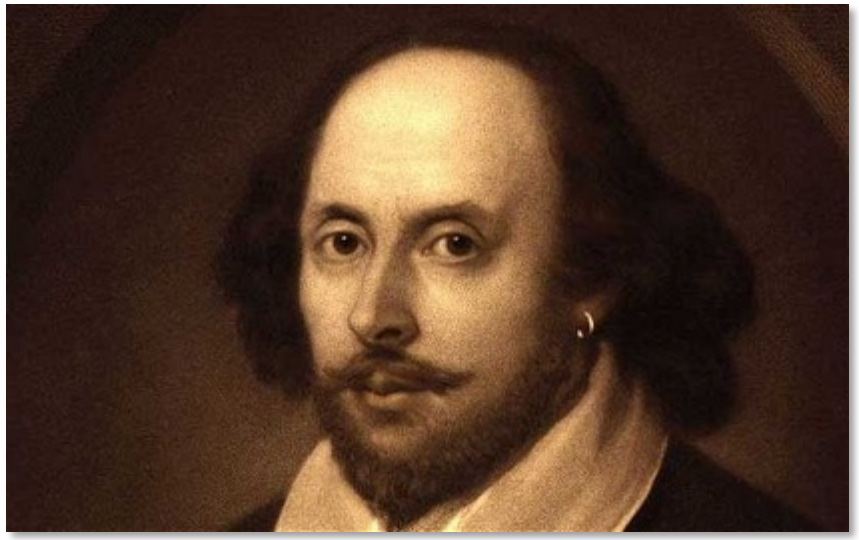
Final Thoughts

"It is not in the stars to hold our destiny but in ourselves"

William Shakespeare (Julius Caesar)



"The harder I practise, the luckier I get."

(Gary Player, Golfer)

AND PLEASE COMPLETE THE FEEDBACK FORM…
THANK YOU!

Good luck in your Data Quality journey and hope our paths cross again…