

Analytics in support of management decision-making: data and people

Dr Eleanor Reynolds
July 2026





Dr Eleanor Reynolds

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BSc, MSc, PhD, AFHEA, WIHEA fellow

WBS BSc Management Science (1999-2002)

WBS MSc Business Analytics and Consulting (2011-2014)

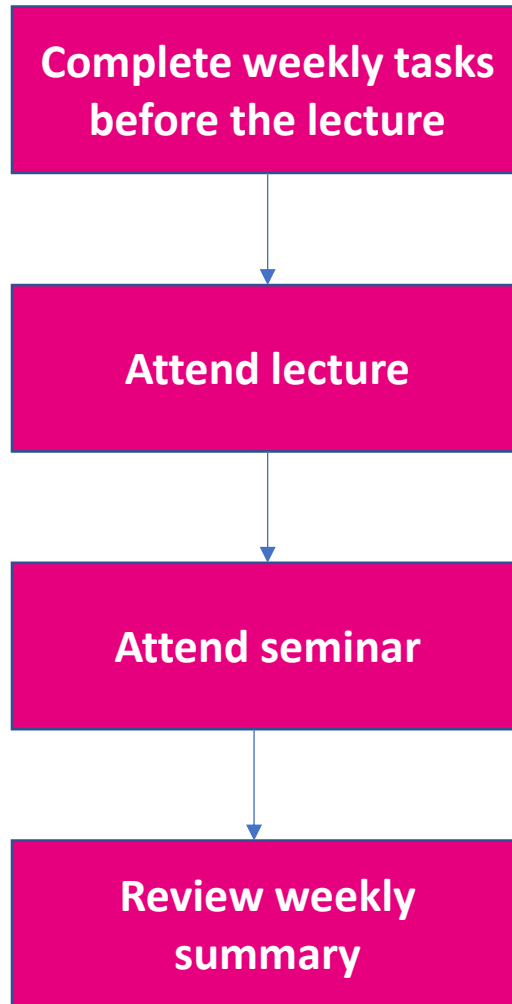
WBS PhD “Discovering Everyday Problem Structuring” (2015-2023)

Severn Trent Water (2003-2015)

*“like the head of a hydra”
(crayon on sugar paper, 2023)*



Typical module delivery approach



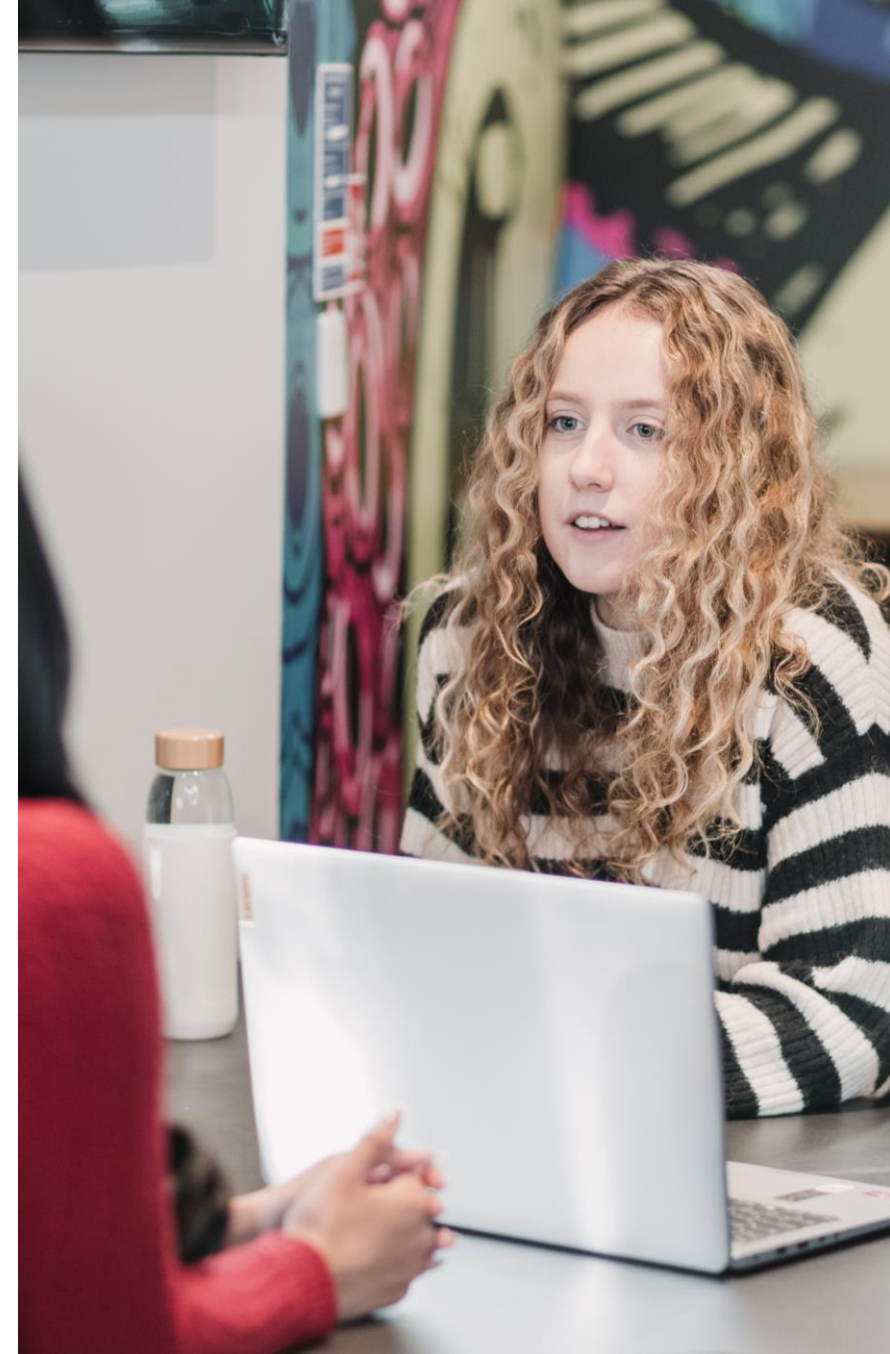
Structure of today's session

Lecture content:

- What might an analytics intervention look like?
- How do we determine what questions our analysis should answer?
- What can we deliver with different analytic approaches?

Seminar content:

- Evaluating real case examples



What might an analytics
intervention look like?

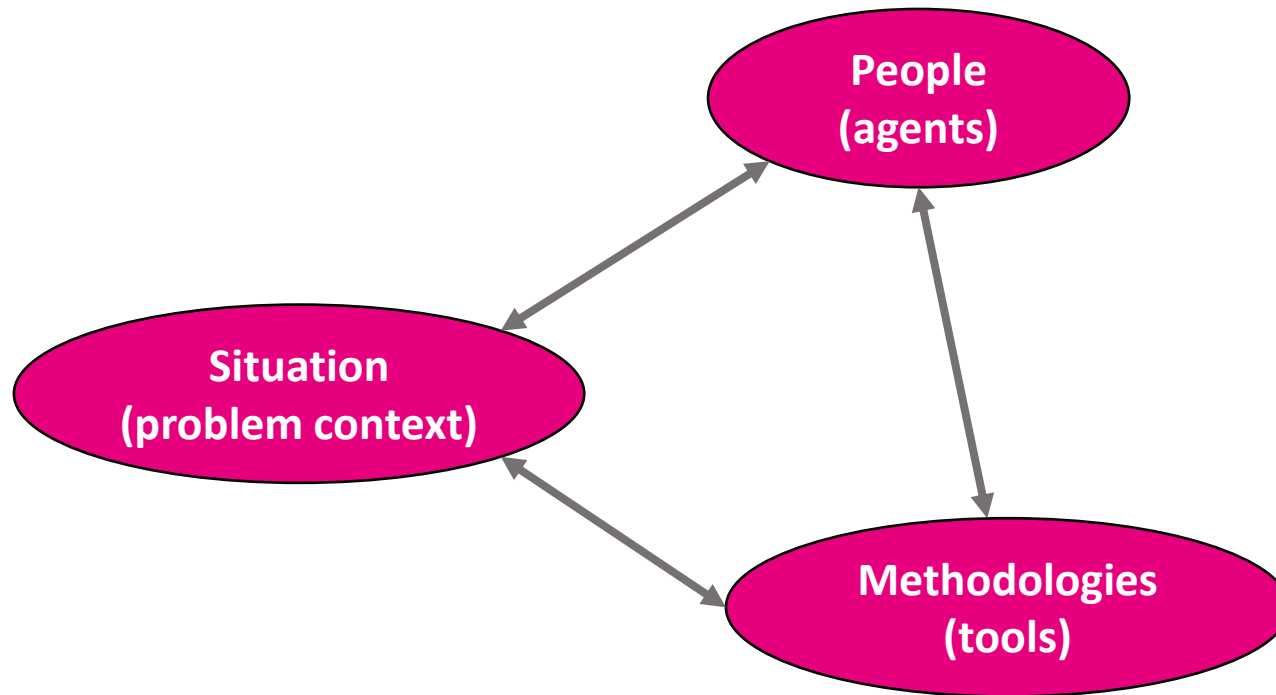


Analytics

- Methods and models to support decision-makers
- Reasoned statement of options and consequences
- **Multimethodological** approach – i.e. combining methods and models
- **Rational, systematic** approach to decision-making



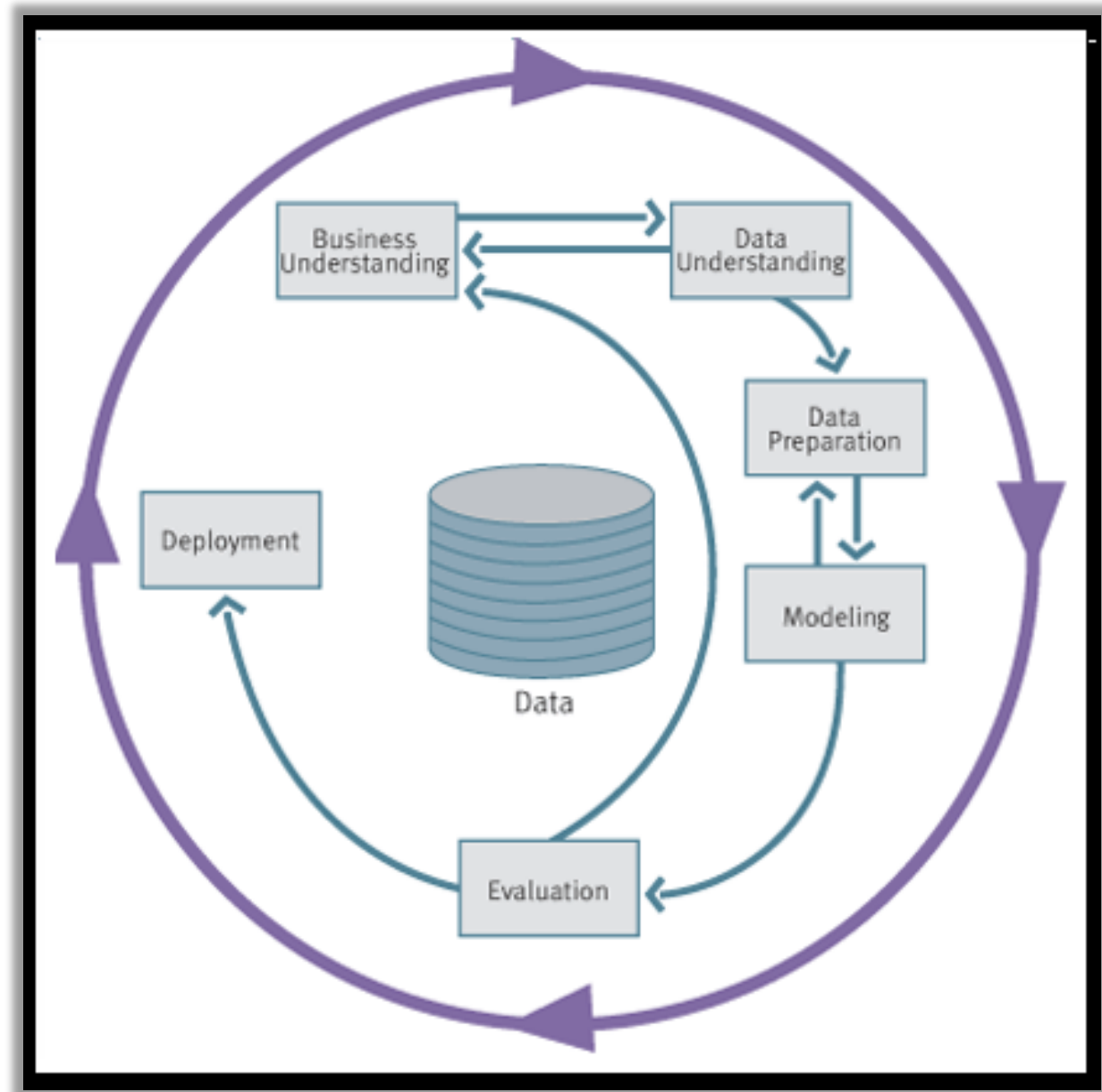
Multimethodology is concerned with intervention design



Three key aspects to consider
(adapted from Mingers, 2001)

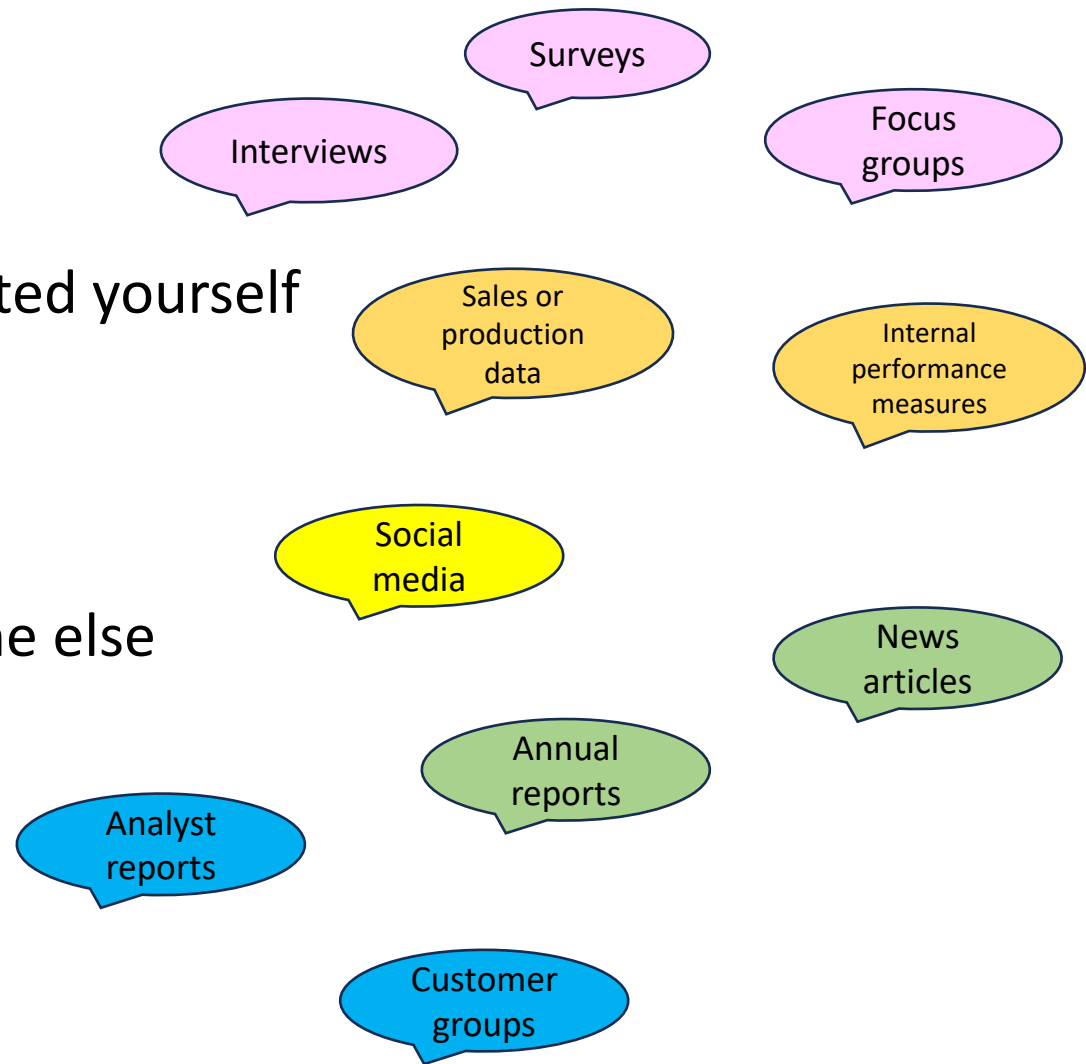


CRISP-DM



Data (1 of 2)

- Primary
 - Data / information you've collected yourself
 - Internally produced data
- Secondary
 - Data / information from someone else
 - Published material



Data (2 of 2)

Primary

Objective

Time series data showing sales volumes to UK retailers

Survey on use of next day delivery services

Subjective

Interviews with general public on pain relief preferences

Report on annual changes in staff satisfaction survey results

Social media-based focus group on knife crime

Secondary

Collation of historical data on regional temperatures

Social media references to musical genre

Industry-wide collation of financial performance metrics

Corpus analysis of journalistic attitudes toward the UK monarchy

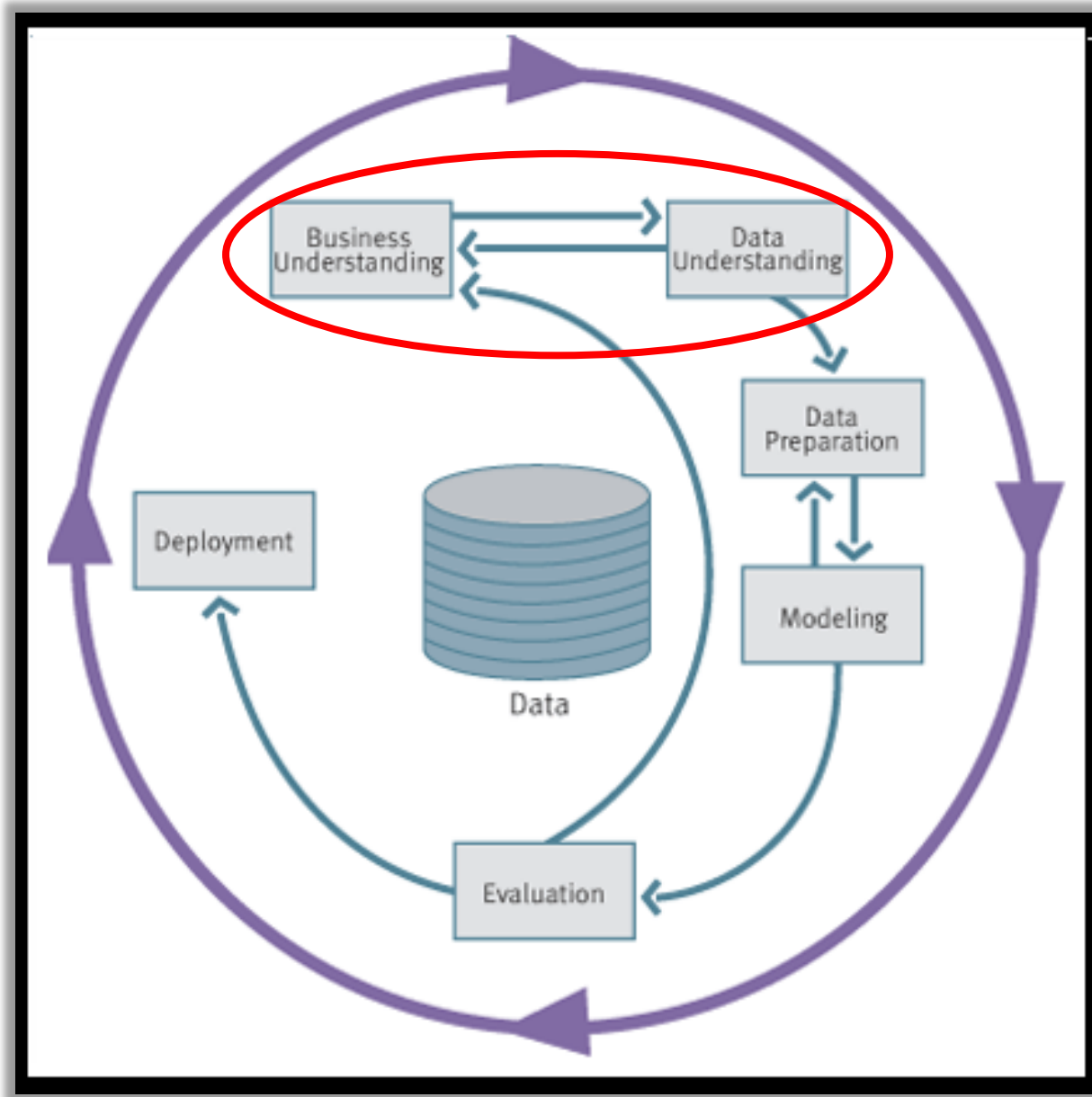
Expert-led report on the future of social media

Analytics is more than code and hard sums

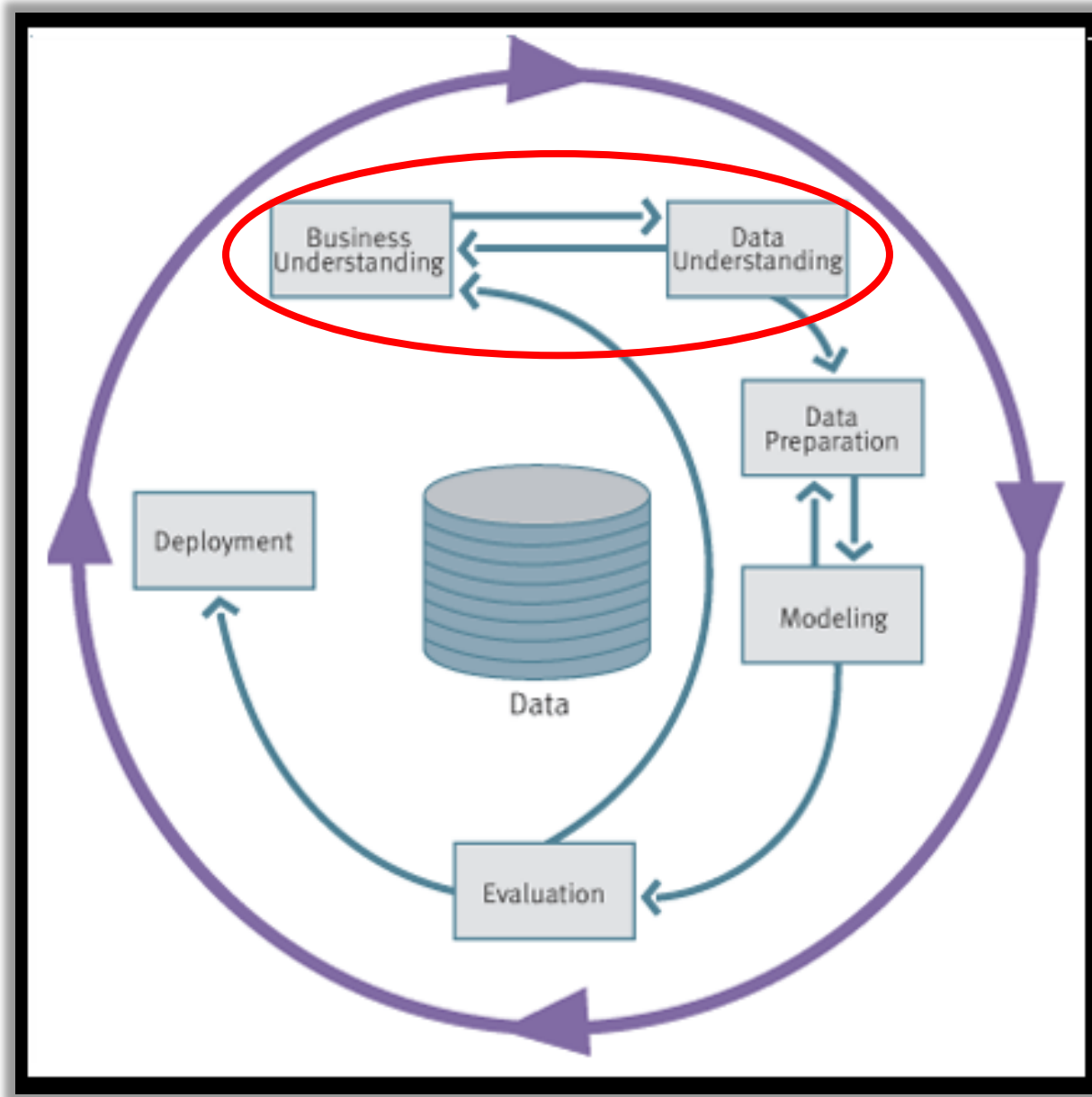
If I had an hour to solve a problem, I'd spend 55 minutes thinking about the problem, and 5 minutes thinking about the solution.

Albert Einstein (allegedly)

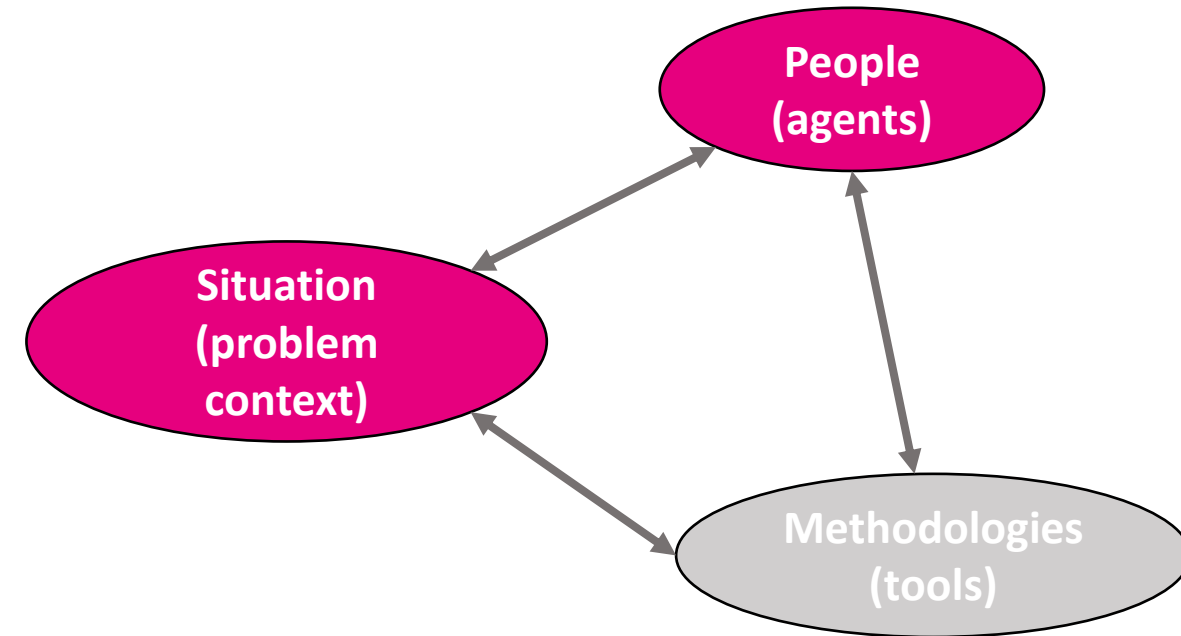
CRISP-DM



CRISP-DM



Intervention design



People... or stakeholders...

noun as in *one with a vested interest*

Synonyms

Strongest matches

collaborator colleague partner shareholder

Strong matches

associate contributor participant

Weak matches

ally team member

[9 Synonyms & Antonyms for STAKEHOLDERS | Thesaurus.com](#)
[accessed 17 July 2025]



What might an analytics intervention look like?

Engaging with stakeholders and data to understand the business problem...

... using a carefully planned sequence of methods and models...

... to establish a reasoned statement of options and consequences...

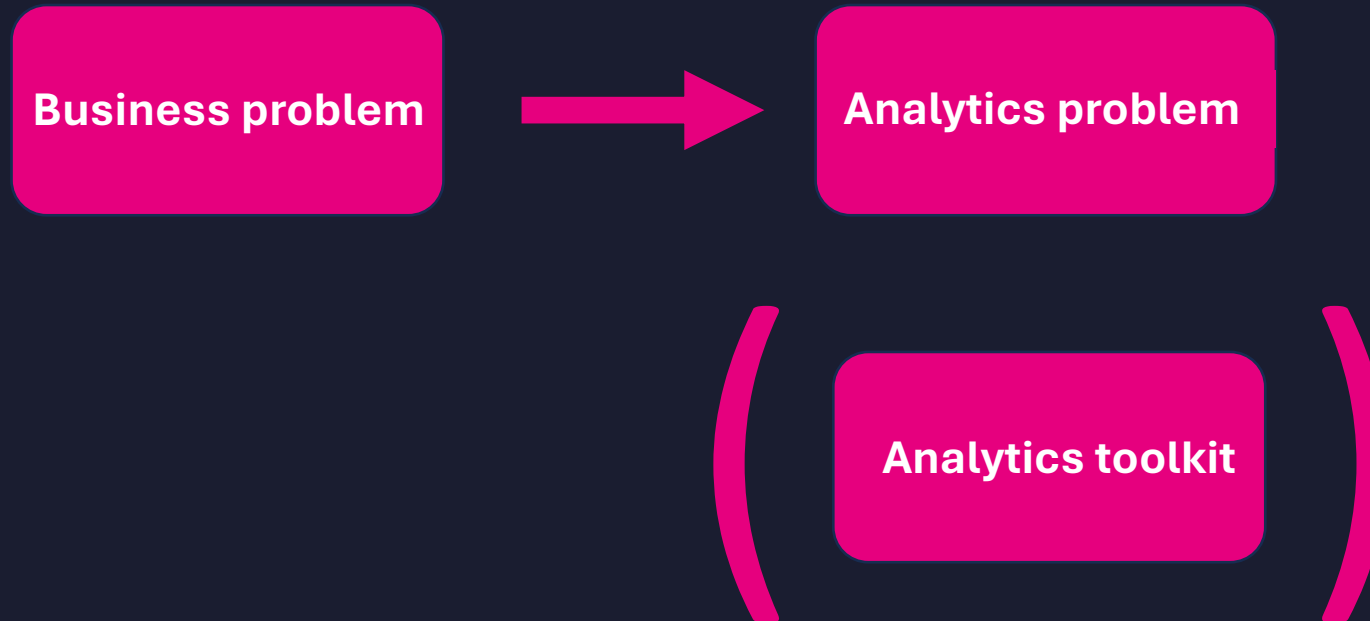
... that provide a rational, systematic approach to supporting decision-makers



How do we determine what questions
our analysis should answer?

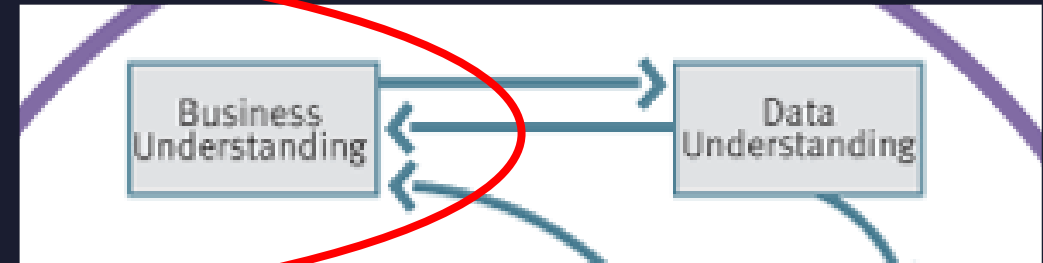


Understanding the business



Understanding the business

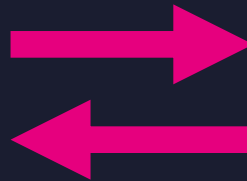
CRISP-DM excerpt



evaluation

onward
activity
flow

Business problem



Analytics problem

Analytics toolkit

Business vs Analytics problems: what's the difference?

Business Problems

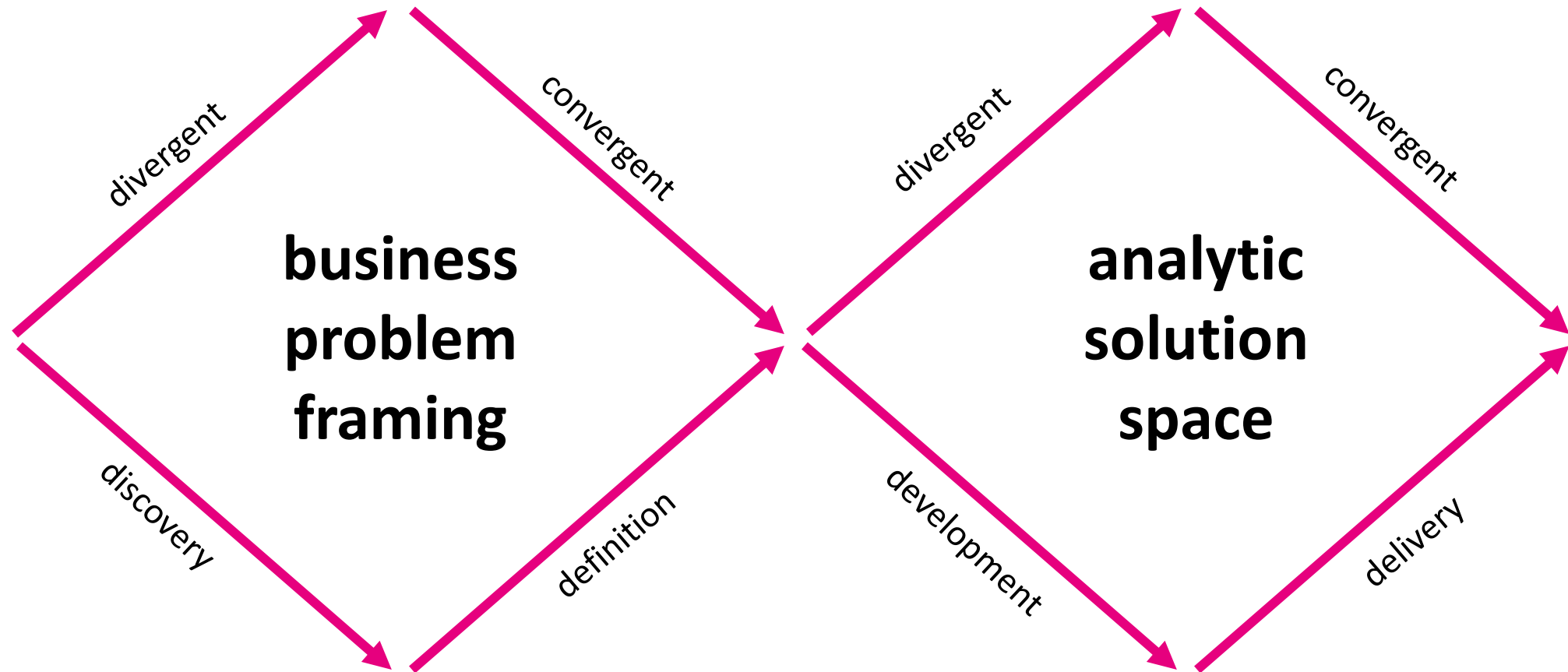
- Expressed in the language of the business
- May initially be vague and poorly specified
- Typically require context to fully define and understand

Analytics Problems

- (Ideally) expressed in the language of the modelling approach
- Need to be precise and well specified
- ~~Typically~~ Must incorporate the required context

Analytics projects are negotiated with stakeholders

From business problem to analytics problem



Problem framing (or problem-setting) is...

“a deliberate and conscious process in which we choose what to study but which is guided by frames that may be unconsciously or subconsciously applied.”

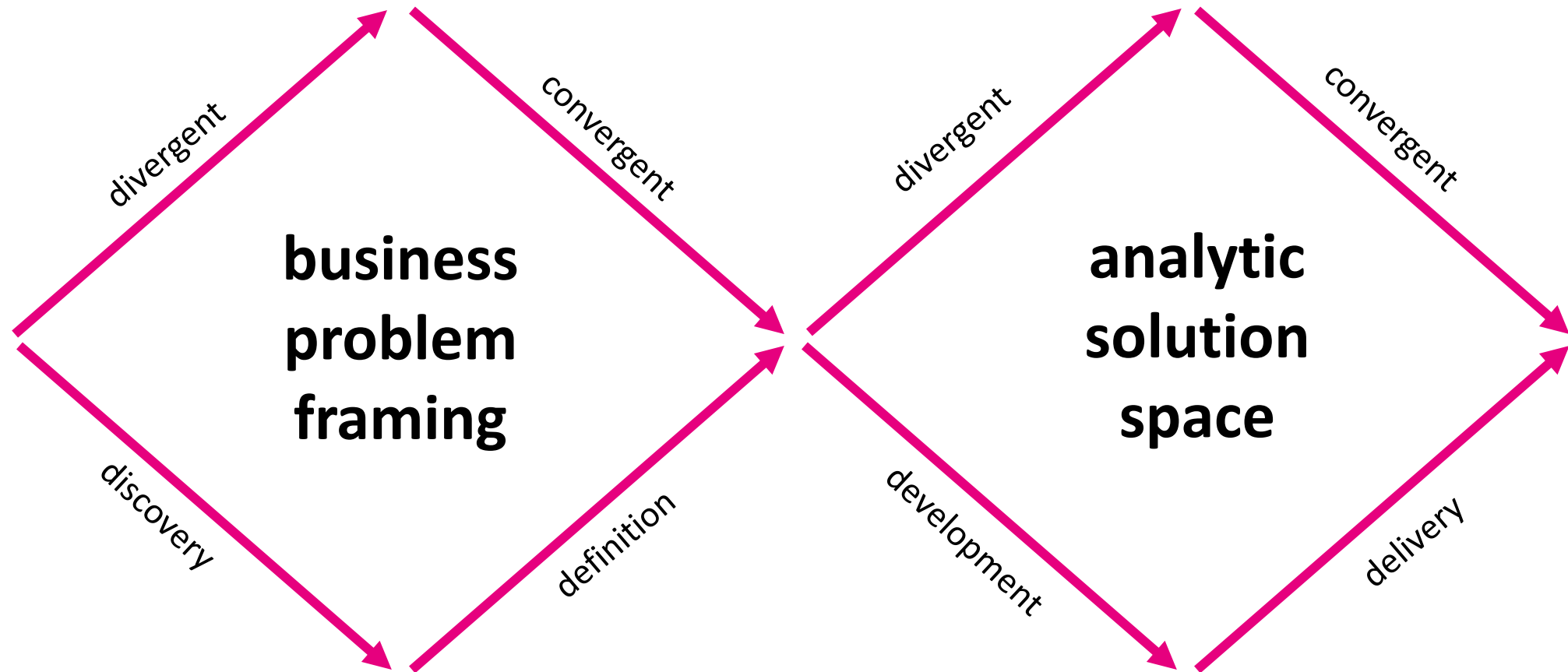
“a frame or framework enables us to see some things and to miss or ignore others.”

(Pidd, 2009, p52)

Play video

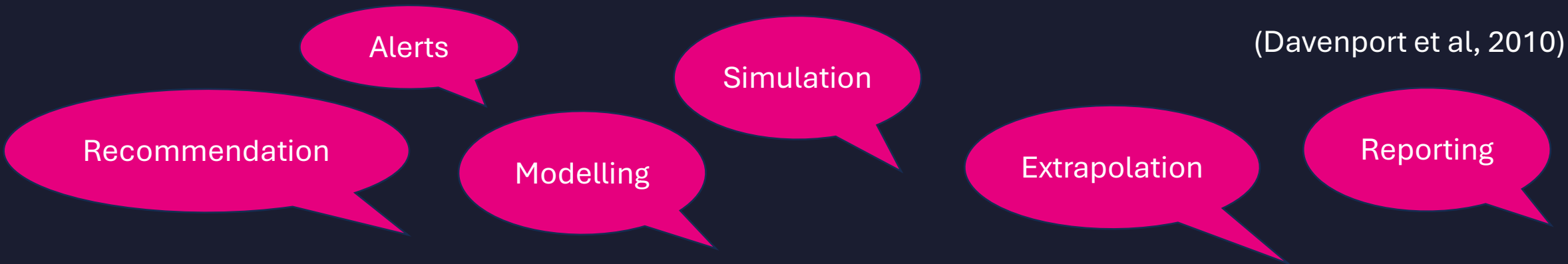
<https://www.youtube.com/watch?v=F-TyPfYMDK8>

From business problem to analytics problem

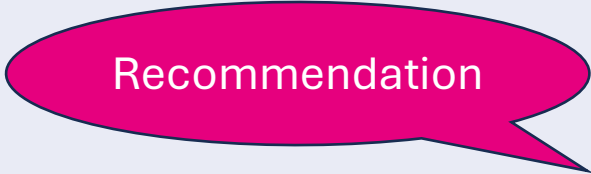
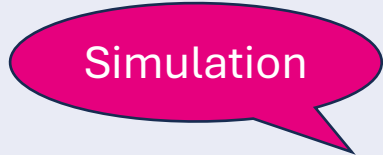


Selection of tools driven by the type of questions we're asking

	Past	Present	Future
Information	What happened?	What is happening now?	What will happen?
Insight	How and why did it happen?	What is the next best action?	What is the best/worst that can happen?



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(Davenport et al, 2010)

How do we determine what questions our analysis should answer?

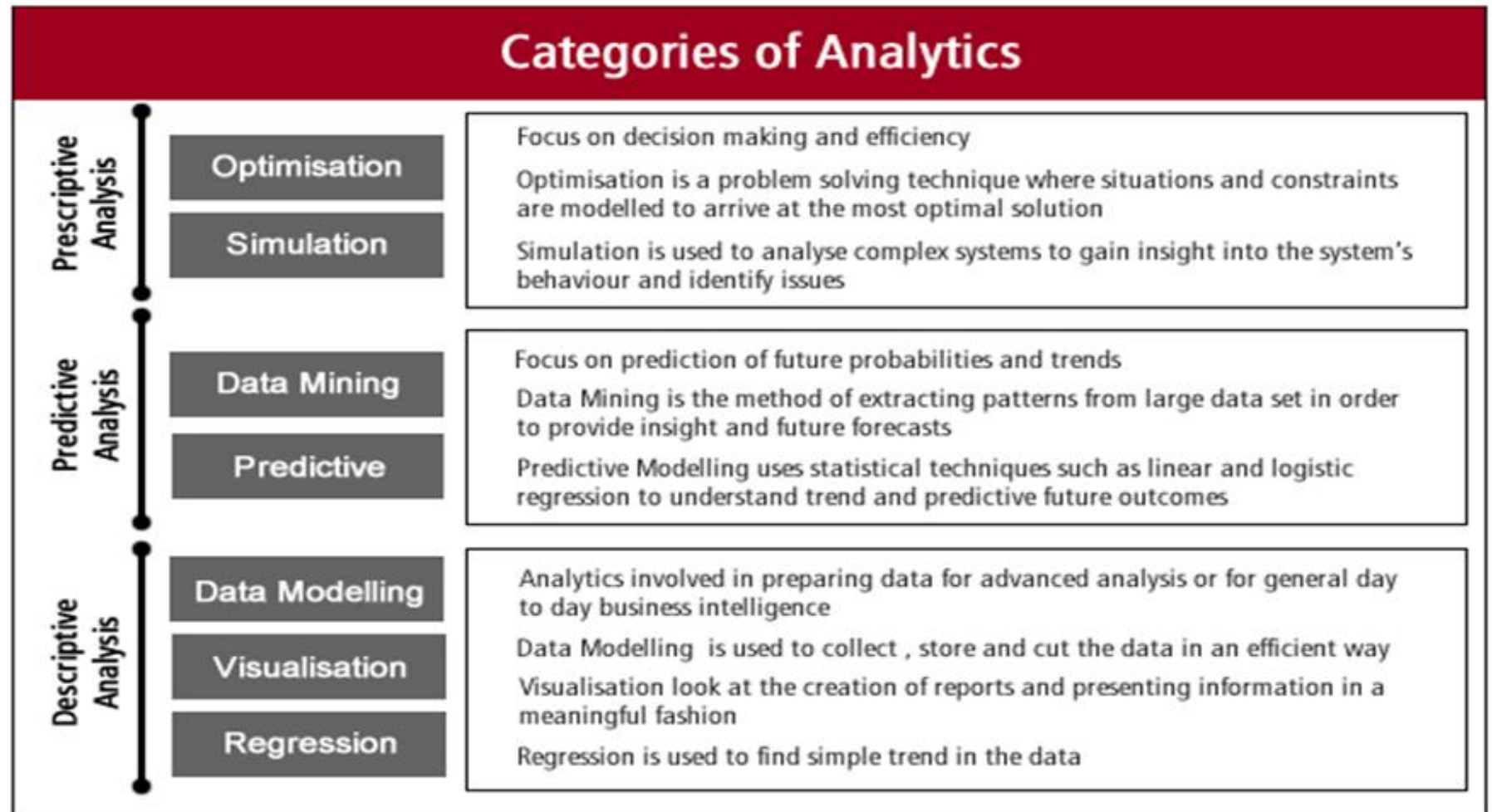
- Engaging with people (stakeholders) and data to understand the business problem
- Translating the business problem into an analytics problem
- Using that translation to identify appropriate tools



What can we deliver with
different analytic approaches?



Solution types (1 of 2)



Solution types (2 of 2)



What can we deliver with different analytic approaches?

- A clear process (sequence of activities) and audit trail (record of sources and of analytic processes)
- Targeted statements about the options and consequences – for example, answering the question “what happens if we try this?”
- Recommendations upon which decision-makers can rely when taking decisions, in the knowledge that the clarity and audit trail support a defensible rationale



What did we cover?

Lecture content:

- What an analytics intervention might look like
- Determining what questions our analysis should answer
- What we can deliver with different analytic approaches

Seminar content:

- Evaluating real case examples

