

Week 4

Finding the real problem

Root cause analysis with the Ishikawa diagram and the Five Whys, and the DPSIR framework applied to real organisations

Jaliya De Silva

BA (Hons), MBA, MSc, PgCert HE, FHEA, MIH, AFRGS

School of Business, University of Wales Trinity Saint David



Today's learning outcomes

01

Explain

why treating symptoms rarely fixes an organisational problem, and what root cause analysis offers instead.

02

Apply

the Ishikawa diagram and the Five Whys to a service problem in a café setting.

03

Analyse

how real organisations affect, and respond to, their environment using the DPSIR framework.

Symptoms sit above the waterline

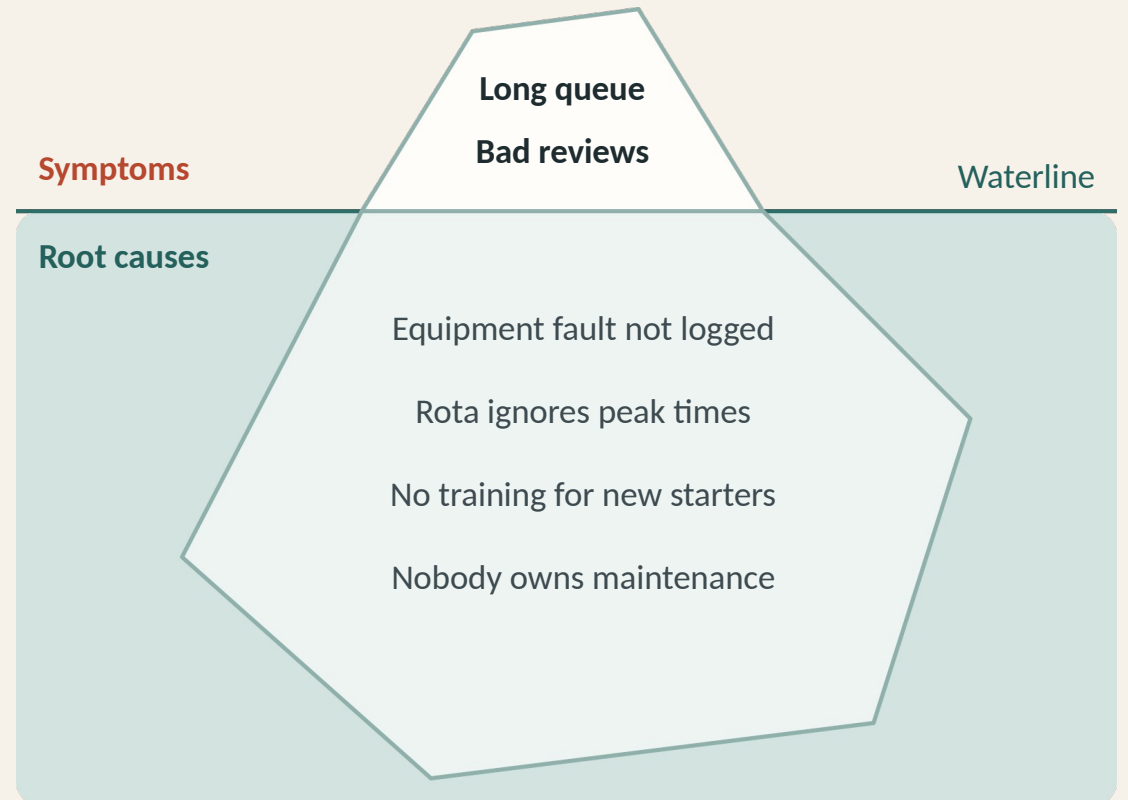
A complaint, a falling sales figure or a bad review is usually a symptom. Fixing the symptom brings short relief, but the problem returns because its cause is untouched.

CAFÉ EXAMPLE

Symptom: at 8.15am the queue reaches the door.

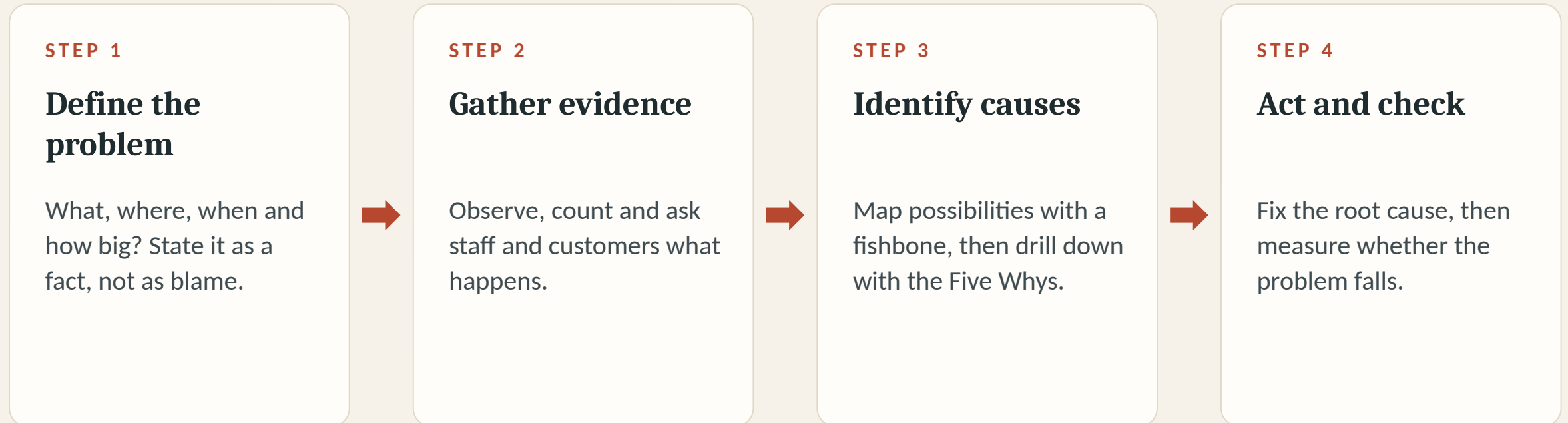
Quick fix: tell staff to work faster.

Root cause found later: one group head on the espresso machine has been broken for weeks, and nobody owns fault reporting.



Root cause analysis in four moves

Root cause analysis (RCA) is a structured way of tracing a problem back to the underlying cause that, once removed, stops the problem from recurring (Andersen and Fagerhaug, 2006).



The Ishikawa (fishbone) diagram

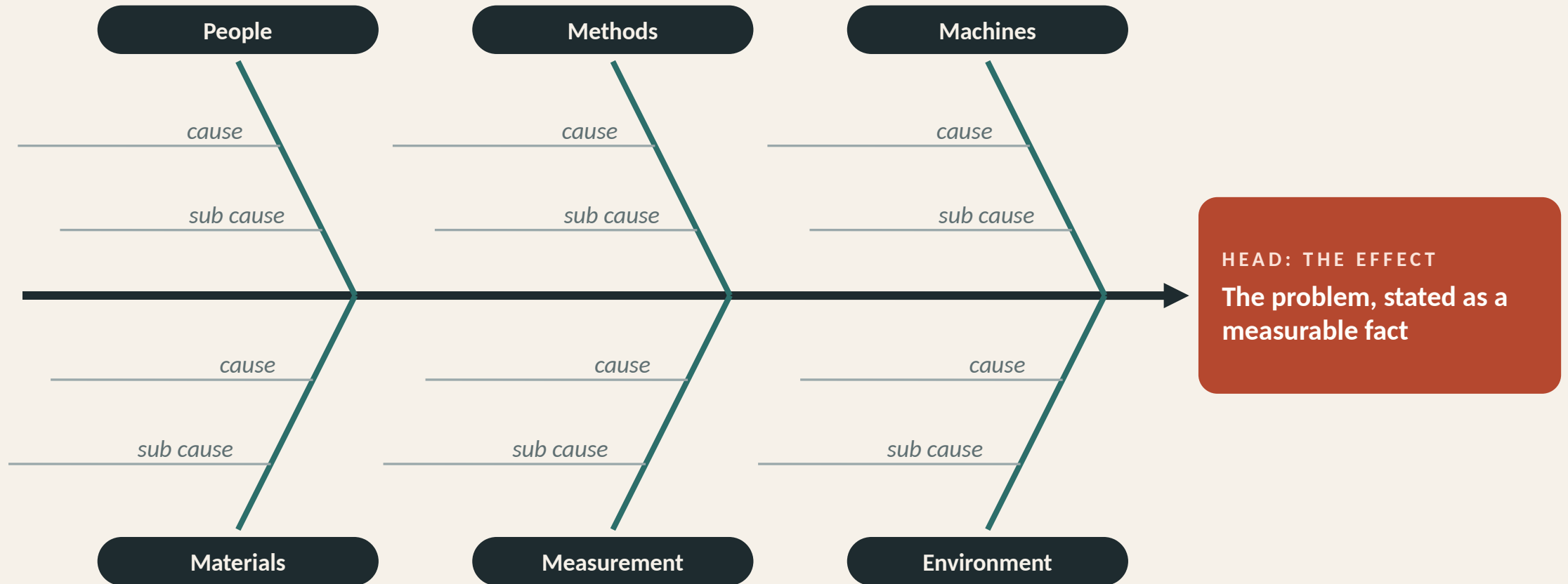
Developed by Kaoru Ishikawa and popularised through Japanese quality management in the 1960s, the diagram sorts the possible causes of one effect into categories, so a team looks wider than its first guess (Ishikawa, 1986).

It does not prove a cause. It organises the search for one.

Common category sets

Setting	Categories
Manufacturing (6Ms)	Manpower, Methods, Machines, Materials, Measurement, Mother Nature
Services (8Ps)	Product, Price, Place, Promotion, People, Process, Physical evidence, Productivity
Services (4Ss)	Surroundings, Suppliers, Systems, Skills
Our café (adapted)	People, Methods, Machines, Materials, Measurement, Environment

Anatomy of a fishbone



Building a fishbone with your team

1

Agree the effect

Write the problem at the head as a specific, measurable fact: what, where, when and how often.

2

Choose the categories

Start from the 6Ms, 8Ps or 4Ss and adapt them so they make sense in your setting.

3

Brainstorm causes

For each bone ask “what could cause this?” Every idea goes up; judgement comes later.

4

Drill down

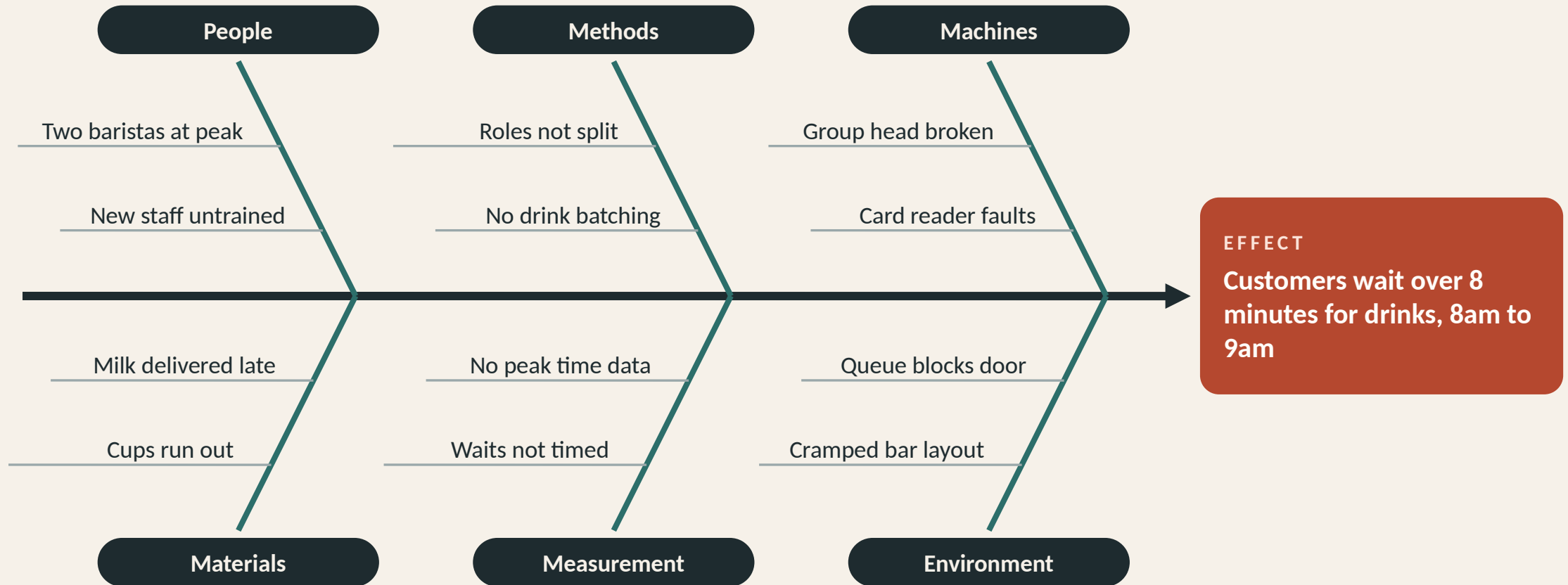
Ask why each cause happens and add the answers as smaller ribs.

5

Test with evidence

Circle the most likely causes, then check them against data before you act.

Why is the morning queue so slow?



The Five Whys

Associated with Sakichi Toyoda and built into the Toyota Production System by Taiichi Ohno (1988), the method asks “why?” again and again. Each answer becomes the next question, until the team reaches a cause it can act on.

Five is a guide, not a rule. Some problems reach their root in three steps; others need seven.

5x

why → why → why → why → why → root cause

Good practice

Start precise. Begin from a clear, factual problem statement.

Use evidence. Each answer should be checked, not guessed.

Ask about the process, not the person.

Stop at a fixable cause that would prevent the problem recurring.

Read it backwards using “therefore”. If the chain still makes sense, it holds.

Why do the flat whites taste burnt?

Problem

Regulars say flat whites taste burnt; complaints doubled this month.

Why 1

The milk is being overheated when it is steamed.

Why 2

Baristas judge temperature by touch and sound, not with a thermometer.

Why 3

The jug thermometers were not replaced when new milk jugs were bought.

Why 4

The order was placed without checking it against the drinks standards.

Why 5

Root cause: nobody is responsible for linking equipment purchases to product standards.

Action

Give the shift manager ownership of equipment standards, replace the thermometers now, and add milk temperature to the opening checklist.

Fishbone and Five Whys compared

	Ishikawa diagram	Five Whys
Purpose	Map many possible causes across categories	Trace one chain of cause and effect to its root
Best for	Complex problems with several contributing factors	Simpler problems, or one bone of a fishbone
Strength	Visual and inclusive; stops a team fixating on one idea	Quick and cheap; needs no special tools
Weakness	Can become a list of opinions without evidence	Follows a single path; answers depend on who is in the room
Output	A shortlist of likely causes to test	A root cause and a countermeasure



In practice: use the fishbone to go wide, then the Five Whys on the strongest bone to go deep.

Use the tools critically



Evidence, not opinion

Both tools can simply record what the loudest person believes. Check each cause against data such as till reports, wait time counts or waste logs.



One cause is rare

Real problems often have several interacting causes. A single chain of whys can push a team towards one tidy answer and miss the rest (Card, 2017).



Blame drift

“Sam was careless” ends the analysis too early. Ask instead why the system allowed the error to happen.

Case: Bean and Bay Café

Bean and Bay is an independent café near Cardiff Bay with 18 seats, a takeaway counter and six part time staff. In three months its online rating has fallen from 4.6 to 3.9 stars, and weekday takings are down 12%.

What the owner knows

- Three of the six staff joined in the last two months
- In July she switched to a cheaper bakery supplier
- A mobile ordering app went live in August
- From 12 to 1pm one person covers while others take breaks

Bean and Bay is a fictional case written for this session.

What customers are saying

“Waited ages, and my order was still wrong.”

“Tables never cleared at lunchtime.”

“Cakes all gone by 11am, again.”

“My app order sat on the counter going cold.”

“Staff seem stressed and new every week.”

Your task: diagnose Bean and Bay

5 min

Agree one problem statement for the head of the fish.

10 min

Build a fishbone with at least two causes on every bone.

8 min

Pick the cause that matters most and run the Five Whys on it.

5 min

Propose one countermeasure and one measure that would show it worked.

2 min

Present to a neighbouring group, who must challenge one of your whys.



Roles

Facilitator: keeps time and draws everyone in

Scribe: builds the fishbone

Evidence checker: keeps asking “how do we know?”

Presenter: shares the result

You need flipchart paper or a shared Miro board, sticky notes and the case slide.

PART TWO

From the café to the wider world

The DPSIR framework: how organisations affect their environment, and how society responds.

What is DPSIR?

Adopted by the European Environment Agency (1999), building on the OECD's Pressure, State, Response model, DPSIR links human activity to environmental change and to the responses it provokes.



Drivers

Social, economic and demographic forces that create demand, such as population growth and consumption.



Pressures

Human activities that stress the environment: emissions, discharges, waste and land use.



State

The resulting condition of the environment: air, water and soil quality, and biodiversity.



Impacts

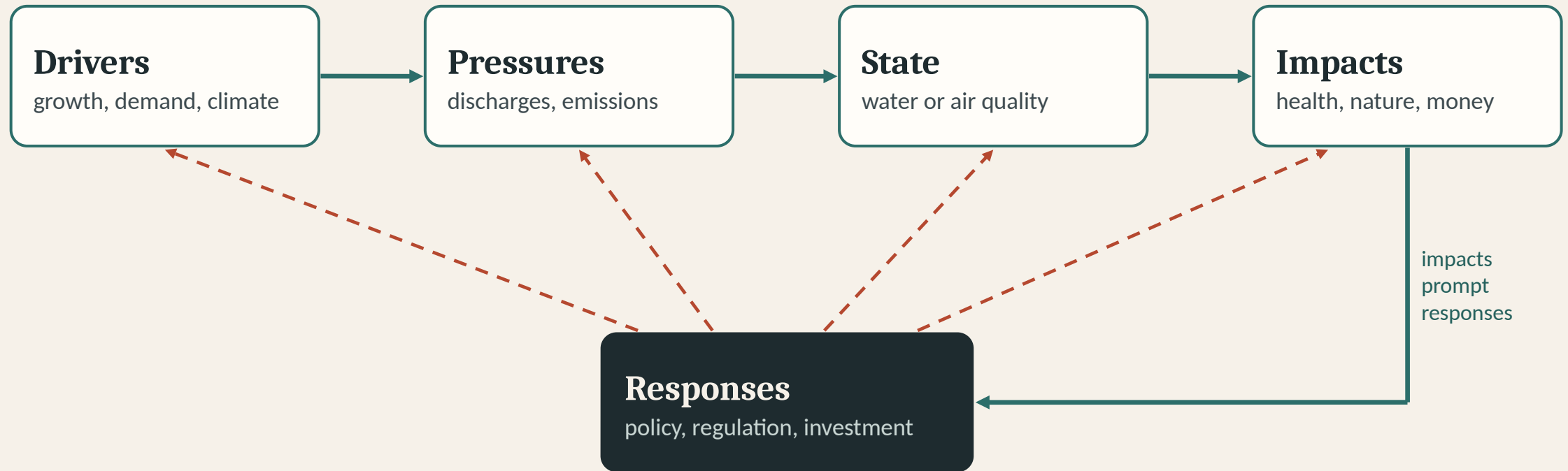
Effects of that change on ecosystems, human health, the economy and organisations.



Responses

Actions by governments, regulators, firms and citizens to tackle any of the other four.

The DPSIR causal chain



Solid arrows: the causal chain. **Dashed arrows:** responses can act on any stage, by reducing drivers, cutting pressures, restoring the state or easing impacts (EEA, 1999).

Case: Hilton and hotel sustainability

Hilton is one of the world's largest hotel companies, with more than 9,100 properties. Every night its hotels use energy, water and food on a vast scale, and every day they generate waste.

Its Travel with Purpose strategy sets environmental targets for 2030, measured against a 2008 baseline.

Why this case? Hotels are where many of you have worked, and every part of DPSIR is visible in daily operations.

50.9%

cut in carbon intensity at managed hotels since 2008
(target 75%)

37.1%

cut in water use intensity since 2008 (target 50%)

64.7%

cut in landfill waste intensity, already past its 50% target

Sources: Hilton Travel with Purpose progress (2026); Lodging Magazine (2026). Full list on the final slide.

Drivers, pressures and state

D Drivers

Growth in global travel, with more hotels and more guest nights.

Guest expectations of comfort: daily laundry, generous buffets, pools and air conditioning.

Brand standards set centrally, and investors and corporate clients asking for sustainability data.

P Pressures

Energy for heating, cooling, kitchens and laundry, much of it from fossil fuels.

Heavy water use in rooms, laundries, kitchens and grounds.

Food waste: UK hospitality and food service throws away about 920,000 tonnes a year, three quarters of it avoidable.

S State

More greenhouse gases in the atmosphere, adding to climate change.

Strain on water supplies in water stressed destinations.

Waste in landfill, where food releases methane as it breaks down.

Sources: WRAP (2013) Overview of waste in the UK hospitality and food service sector; Hilton (2026).

Impacts and responses

I Impacts

Environmental: climate change and water scarcity that threaten the very destinations hotels depend on.

Financial: rising energy, water and waste bills; WRAP put the UK sector's food waste cost at £2.5bn a year.

Reputational: corporate clients and travellers increasingly choose hotels on sustainability performance.

R Responses

Hilton: its LightStay system measures energy, water and waste at every property against 2030 targets.

Hilton: food waste programmes in 73% of hotels, and over 2.4 million pounds of food donated in 2025.

Government: since April 2024, all workplaces in Wales, hotels included, must separate food waste for recycling.

Sector: WRAP works with hotels and caterers to measure and cut food waste.

Sources: Hilton Travel with Purpose (2026); Lodging Magazine (2026); WRAP (2013); Welsh Government (2024).

Where root cause analysis meets DPSIR

DPSIR maps the whole system. Root cause analysis asks why a pressure persists inside the organisation.

Since 2008, Hilton's managed hotels have cut carbon intensity by 50.9%, but franchised hotels by only 36.0%.

Why the gap? That is a root cause question.

1

Sketch a fishbone for “too much food wasted at the hotel breakfast buffet”. Which causes can the hotel control, and which can it not?

2

Run the Five Whys on the gap between managed and franchised hotels. Where does your chain end?

3

Which DPSIR response tackles a root cause, and which only treats a symptom? Justify your answer.

Source: Lodging Magazine report on Hilton's 2025 Travel with Purpose results (2026).

Case: greenwashing in online fashion

In July 2022 the Competition and Markets Authority (CMA) opened an investigation into the green claims that ASOS, Boohoo and George at Asda made on their websites and apps.

Ranges such as ASOS's "Responsible edit", Boohoo's "Ready for the Future" and George for Good were marketed as greener choices. The CMA was concerned that shoppers were being misled.

20%

recycled fabric in some items sold within "eco" ranges

March 2024

all three retailers signed formal undertakings to change

10%

of global turnover: the fine the CMA can now impose directly

Sources: CMA case page (2024); Fieldfisher (2025). Full list on the final slide.

Green claims through the DPSIR lens

	Element	Online marketing evidence
D	Drivers	Growth of online fashion; shoppers wanting sustainable products; pressure to stand out in search results and social feeds
P	Pressures	Vague green labels, leaf imagery and “sustainable” filters on sites and apps; eco ranges with loose criteria; high volume fast fashion
S	State	Shoppers unable to tell which products are genuinely greener; weakened trust in green claims; continued overproduction of clothing
I	Impacts	Consumers misled; greener competitors disadvantaged; for the retailers, a two year investigation and reputational damage
R	Responses	CMA Green Claims Code (2021); undertakings on fibre percentages, range criteria and accurate filters (2024); direct CMA fines from April 2025



Discuss: run the Five Whys on “an item with 20% recycled fabric was listed in an eco range”. Does your chain end in systems, incentives or culture?

Key takeaways and reading

1

Symptoms are clues, not answers.

2

The fishbone goes wide; the Five Whys goes deep.

3

DPSIR places an organisation's problems inside a wider environmental and social system.

Reading

Andersen, B. and Fagerhaug, T. (2006) *Root Cause Analysis: Simplified Tools and Techniques*. 2nd edn. Milwaukee: ASQ Quality Press.

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Competition and Markets Authority (2024) *Fashion greenwashing: investigation into ASOS, Boohoo and Asda*. Available at: gov.uk

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Fieldfisher (2025) *Greenwashing under scrutiny: the CMA's new powers to tackle misleading environmental claims*. Available at: fieldfisher.com

Figures checked October 2026. Check Hilton's latest Travel with Purpose report before teaching.