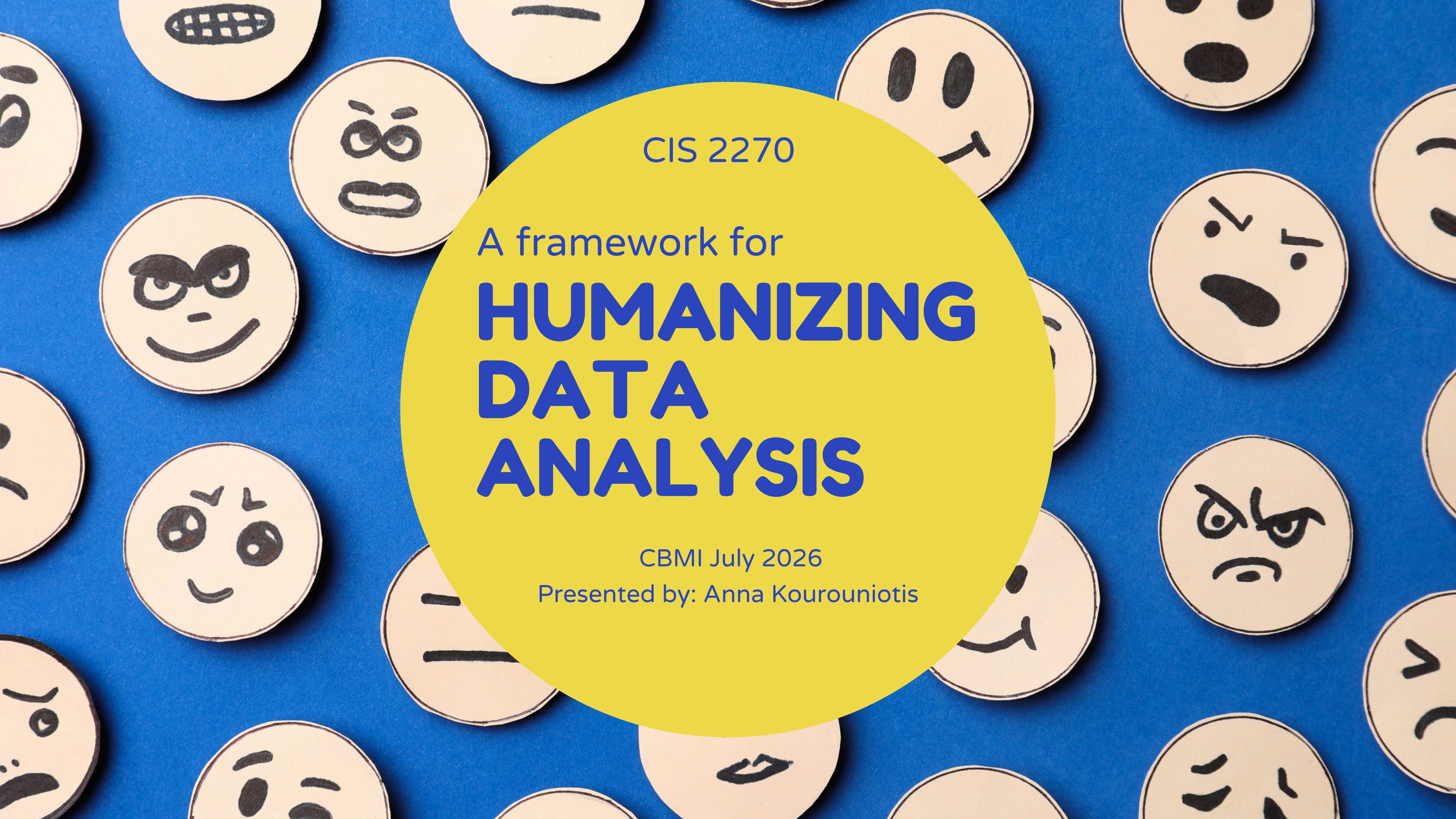


The background of the slide is a vibrant blue surface covered with numerous small, circular, hand-drawn faces. Each face is drawn with simple black ink on a light-colored paper or card. The faces exhibit a wide variety of expressions, including happiness, surprise, anger, sadness, and neutrality. Some faces have large, round eyes, while others have more abstract or stylized features. The overall effect is a dense, colorful pattern of human-like expressions.

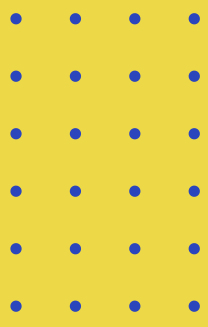
CIS 2270

A framework for

HUMANIZING DATA ANALYSIS

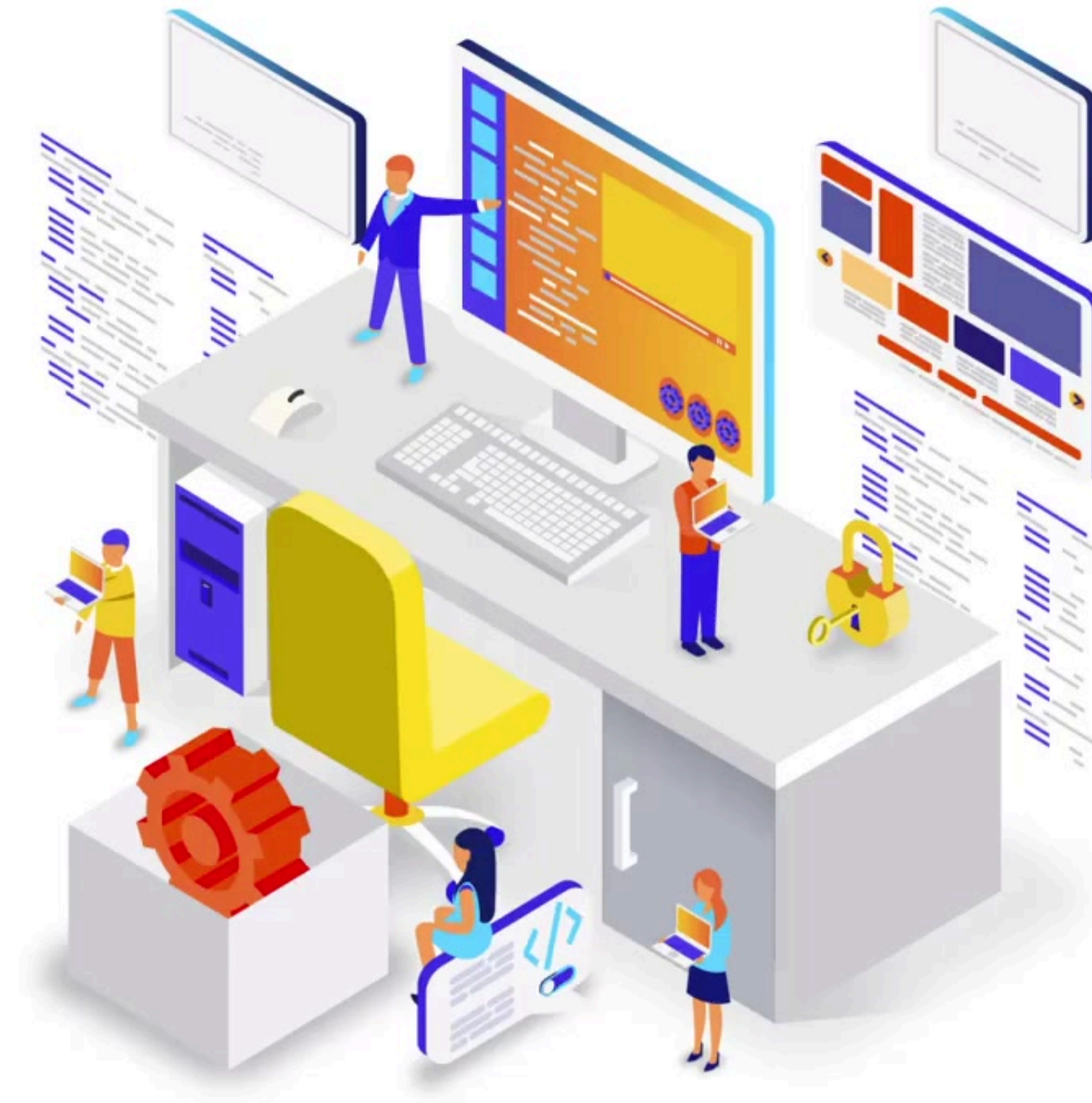
CBMI July 2026

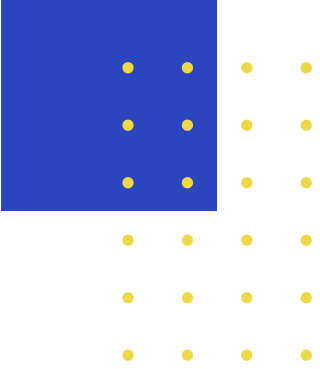
Presented by: Anna Kourouniotis



**WHY YOUR PERFECT QUERY
DOESN'T ALWAYS WIN THE DAY**

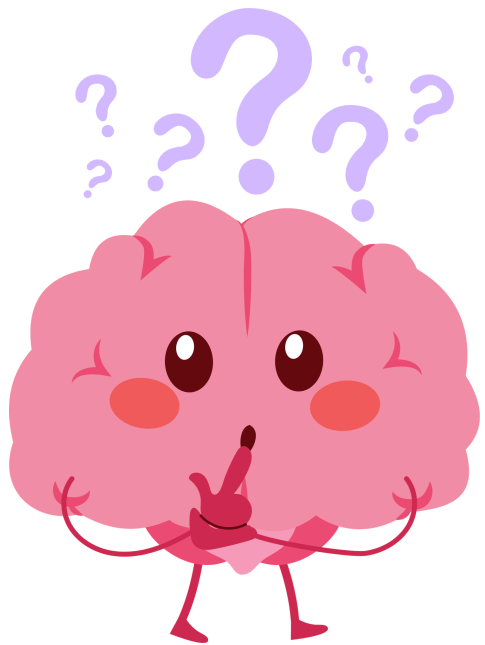
**WHY YOUR PERFECT QUERY
DOESN'T ALWAYS WIN THE DAY**





WHY YOUR PERFECT QUERY DOESN'T ALWAYS WIN THE DAY

What frustrates you?



**WHY YOUR PERFECT QUERY
DOESN'T ALWAYS WIN THE DAY**

"What if the missing piece isn't better tools,
but better conversations?"



HUMANIZING DATA ANALYSIS

5 Common Traps

01

Trap #1 – Starting with the Tool, Not the Problem

02

Trap #2 – One-Size-Fits-All Explanations

03

Trap #3 – Why Technical Detail Isn't Enough

04

Trap #4 – Not Defining the Real Problem

05

Trap #5 – Working in Isolation

Mindset Shift

Understand how to shift from a tool-centered to a problem-centered mindset, ensuring data work aligns with actual decision-making needs.

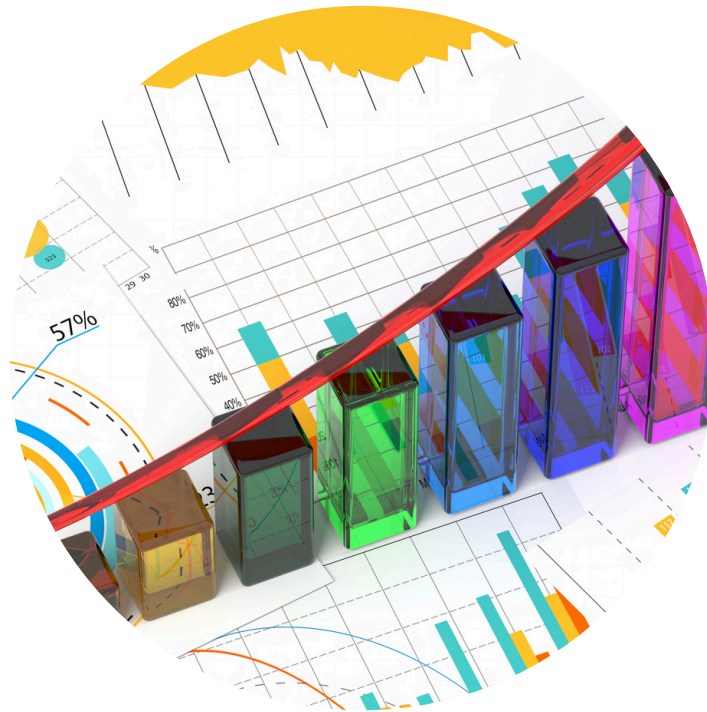
Human-centered strategies

Learn strategies to tailor data insights and explanations to different audiences, improving stakeholder understanding and engagement.

Practical applications

Develop collaborative habits, such as gathering early feedback and defining problems through dialogue, to enhance solution relevance and adoption.

ABOUT ANNA



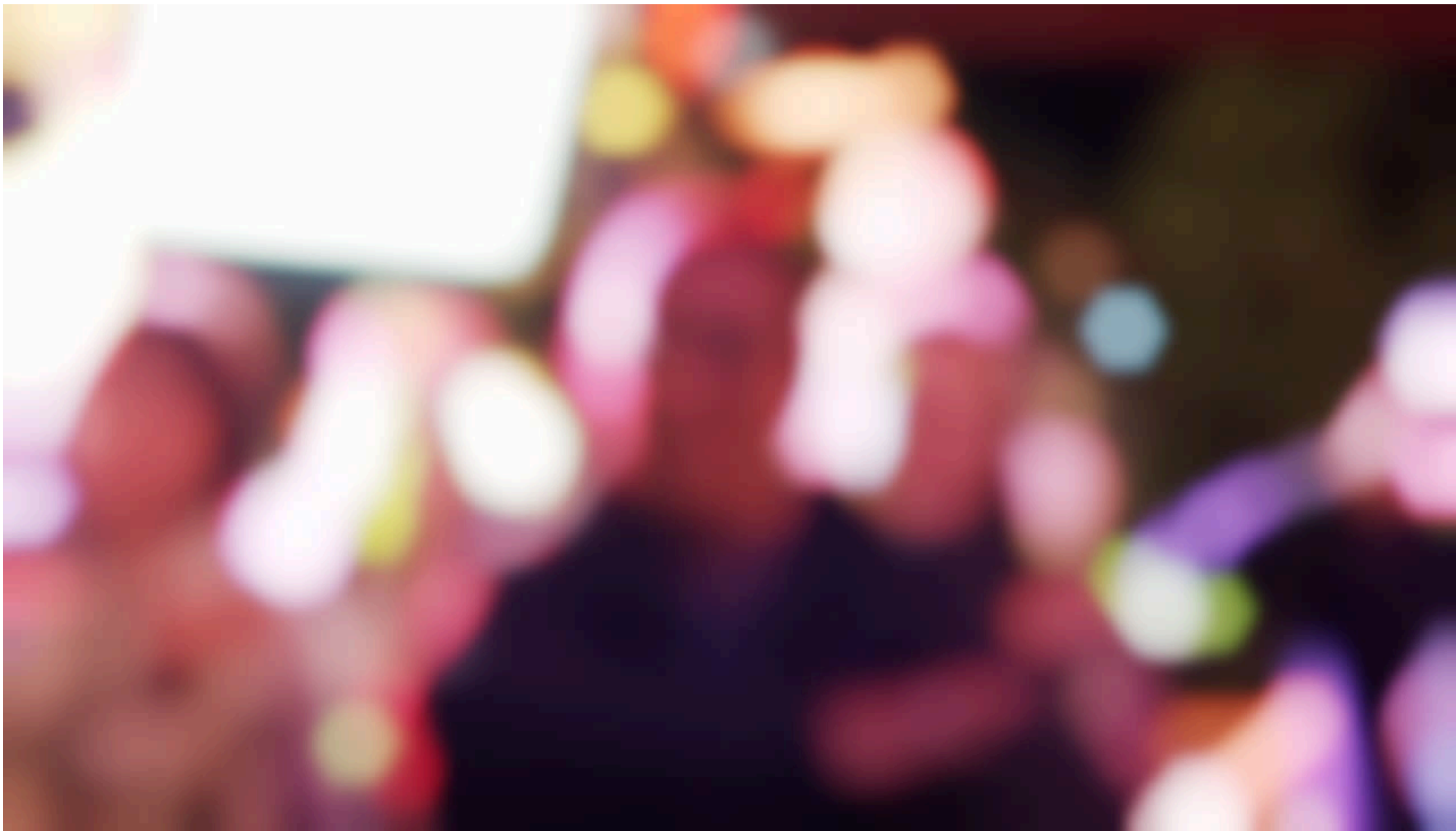
Database Analyst II
(Duke University)



Grassroots Certified
Soccer Coach



Design Thinker



How might you define Data Analysis?



**DATA ANALYSIS STARTS WITH THE END
GOAL IN MIND**

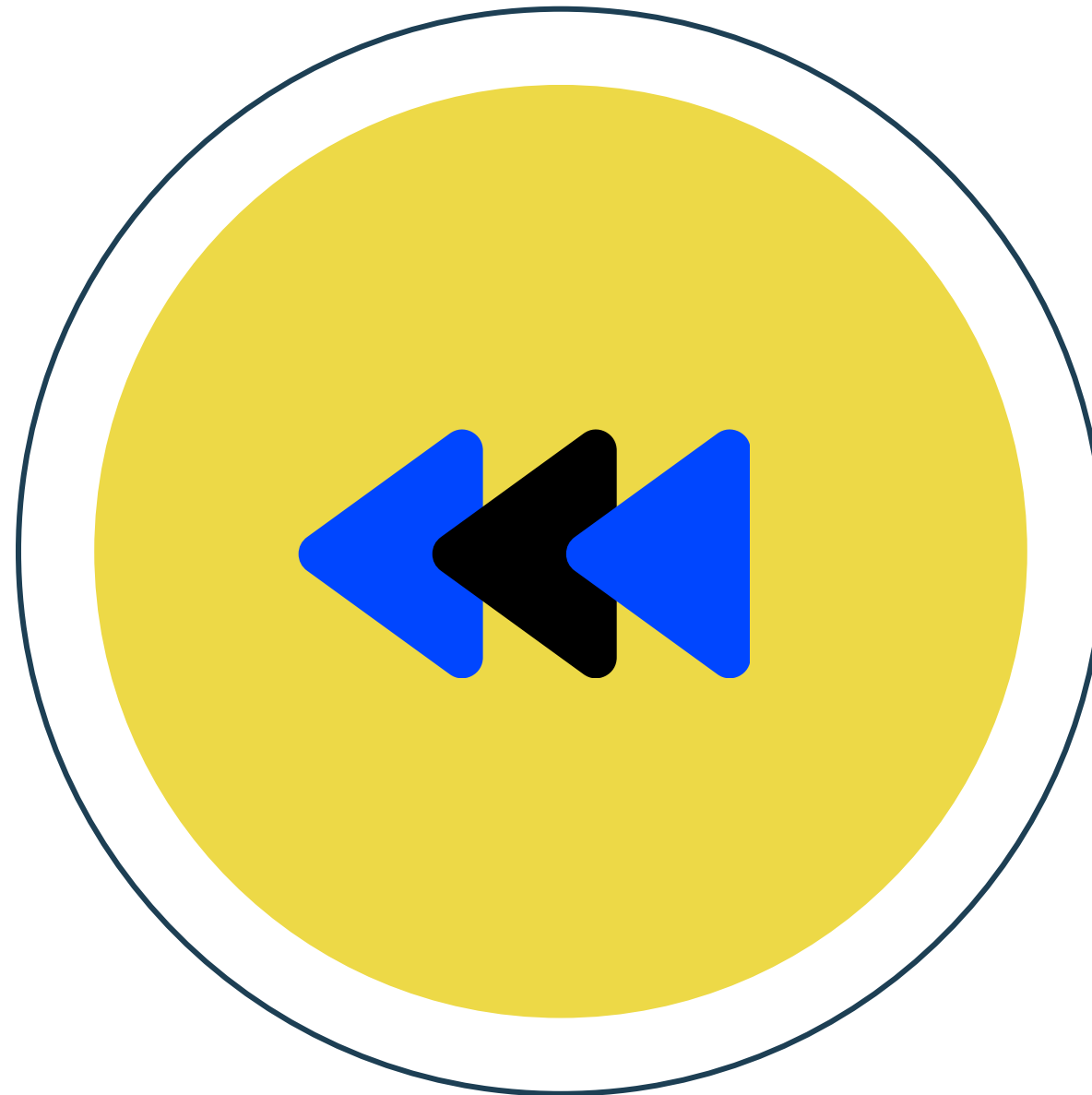
To begin with the end in mind
means to start with a clear
understanding of your destination.

-Stephen R. Covey, The Seven Habits
of Highly Effective People



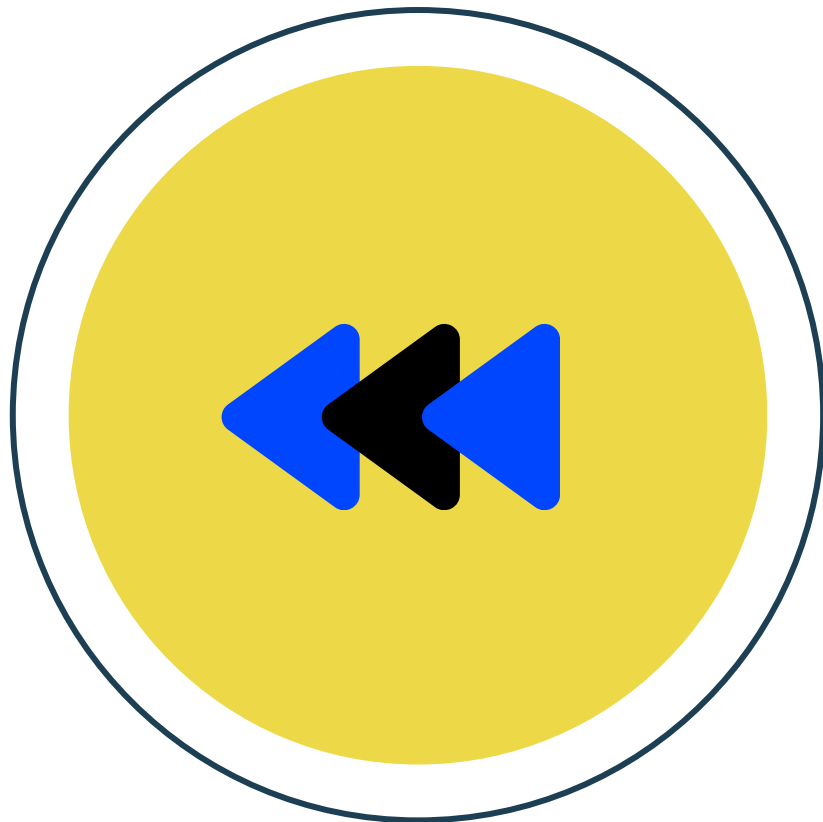
Backward Design

Wiggins and McTighe (2005)



Backward Design

Wiggins and McTighe (2005)



01 Identify Desired Results

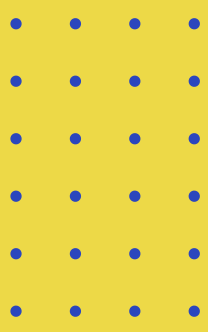
What decision needs to be made?

02 Determine Acceptable Evidence

What data & metrics do we actually need?

03 Plan Learning Activities

Choose the right tool.



TRAP #1 – STARTING WITH THE TOOL, NOT THE PROBLEM

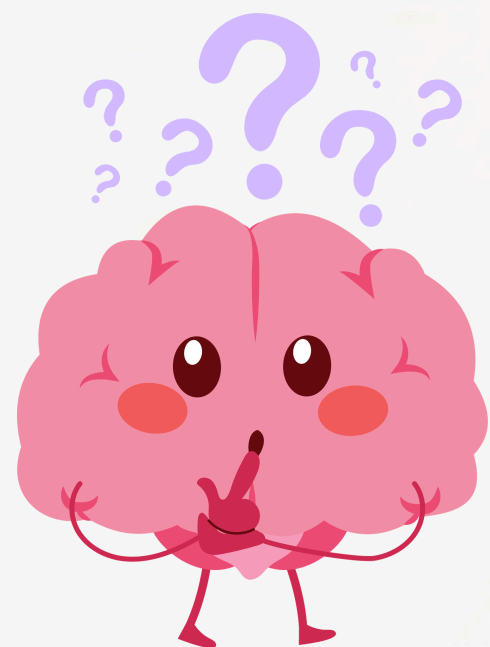
TRAP #1 – STARTING WITH THE TOOL,
NOT THE PROBLEM

"Stop Chasing Shiny
Start Asking Better Questions"









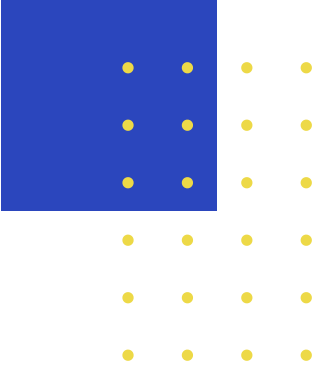
**TRAP #1 – STARTING WITH THE TOOL,
NOT THE PROBLEM**

Tools Don't Solve
Problems, People Do

Tim Kastle

Teacher of innovation - University of Queensland Business School

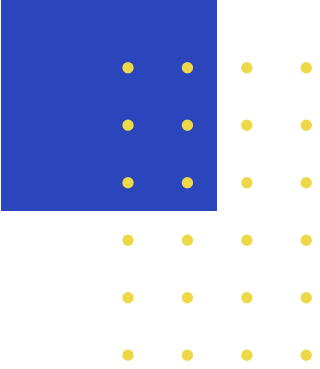




TRAP #1 – STARTING WITH THE TOOL, NOT THE PROBLEM

The Cost

- Building the wrong thing
- No adoption
- Frustrated stakeholders

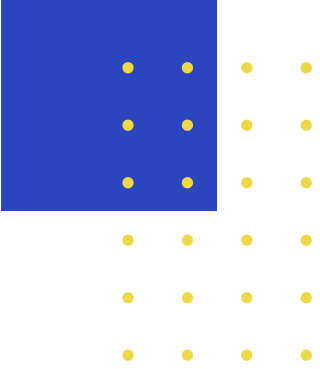


TRAP #1 – STARTING WITH THE TOOL, NOT THE PROBLEM

Some discoveries begin with
investigating solutions, rather
than the problems those
solutions are intended to solve.

The Nielsen Norman Group





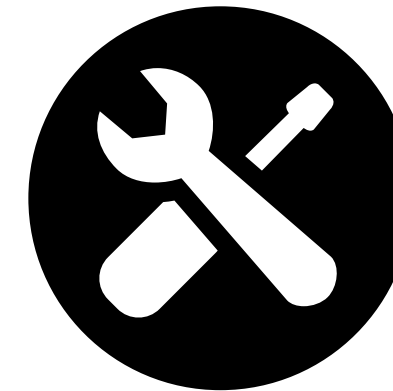
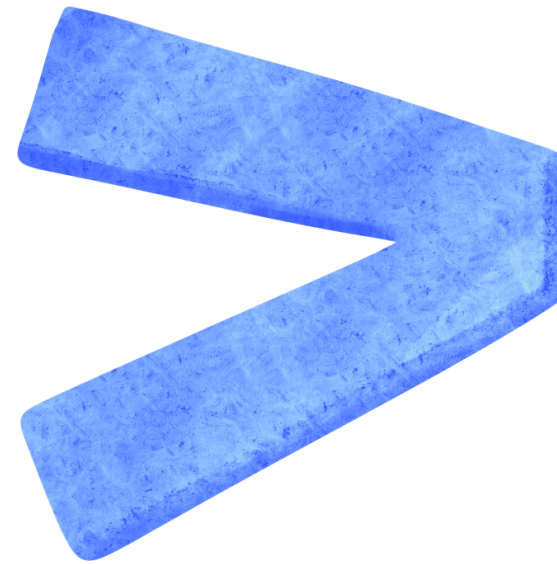
TRAP #1 – STARTING WITH THE TOOL, NOT THE PROBLEM



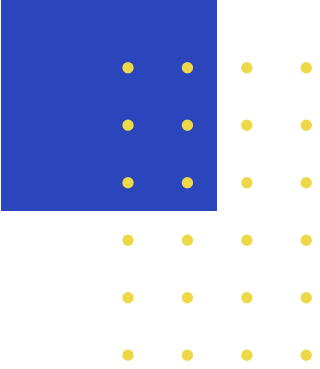
Business Acumen



Co-Creation



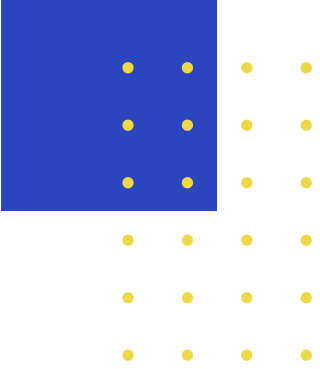
Tools



TRAP #1 – STARTING WITH THE TOOL, NOT THE PROBLEM

How to flip it

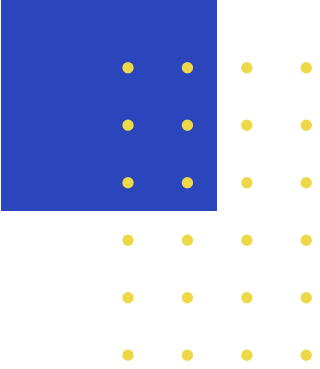
- Ask "What decision actually needs to be made here?"



TRAP #1 – STARTING WITH THE TOOL, NOT THE PROBLEM

How to flip it

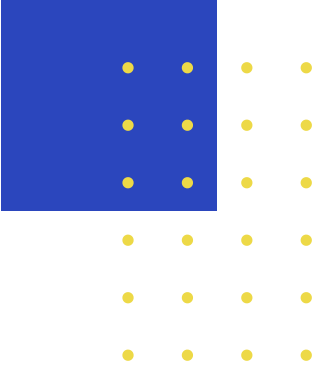
- Ask "What decision actually needs to be made here?"
- Match your tool to the need.



TRAP #1 – STARTING WITH THE TOOL, NOT THE PROBLEM

How to flip it

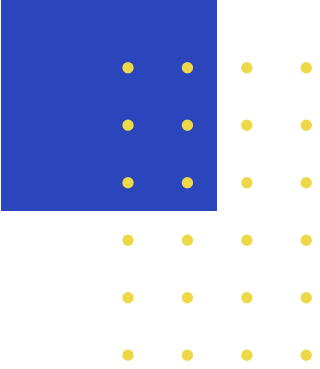
- Ask "What decision actually needs to be made here?"
- Match your tool to the need.
- Figure out what variables are needed before selecting the tool.



TRAP #1 – STARTING WITH THE TOOL, NOT THE PROBLEM

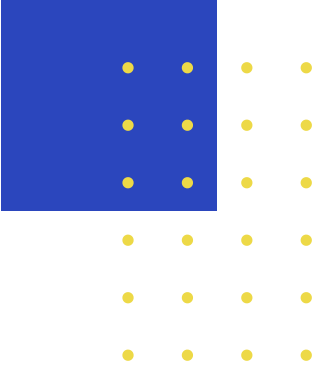
How to flip it

- Ask "What decision actually needs to be made here?"
- Match your tool to the need.
- Figure out what variables are needed before selecting the tool.
- Get comfortable answering similar business questions across tools.



TRAP #1 – STARTING WITH THE TOOL, NOT THE PROBLEM

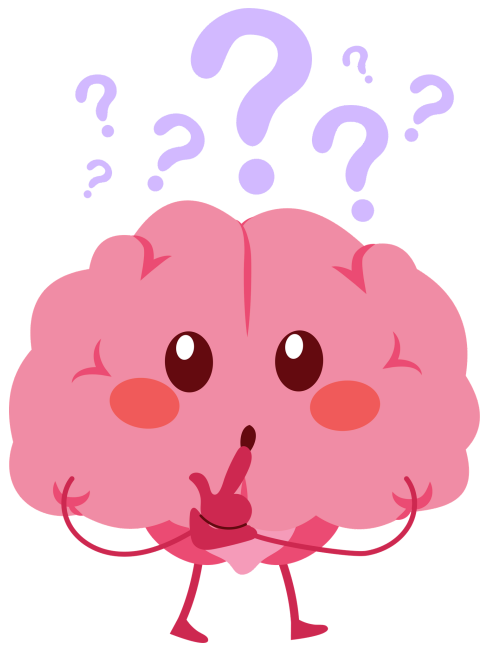
The problem defines the analysis — the tool never should.

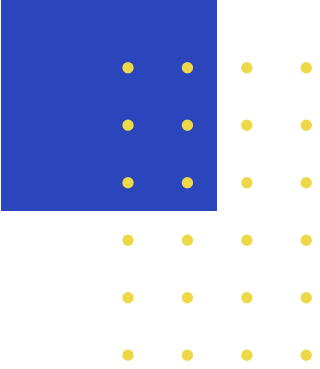


TRAP #1 – STARTING WITH THE TOOL, NOT THE PROBLEM

Request: "We need a new Tableau report on course fill rates."

What 3 questions do you
ask before building?"





TRAP #1 – STARTING WITH THE TOOL, NOT THE PROBLEM

Three core tips

Clarify business intelligence report requests before building



1. Understand the Purpose and Impact

- Ask what business problem the requester is trying to solve.
- Clarify what decision or action could change as a result of the report.
- Find out which specific metrics or insights are most valuable to the requester.



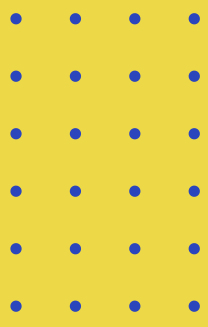
2. Define the Audience and Usage

- Identify who will use the dashboard or report, and their level of data expertise.
- Ask how the report will help their daily work or broader goals.
- Ensure any technical details match user needs (visualization types, interactivity).

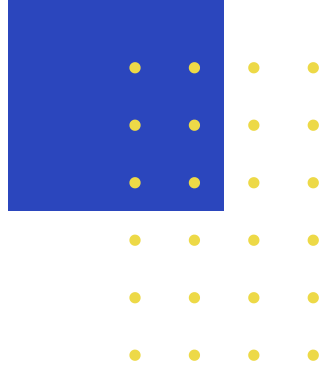


3. Specify Data Details and Scope

- Clarify time periods, data sources, and relevant filters for analysis.
- Ask if the data is reliable, up-to-date, and structured for the analysis.
- Use benchmarks or comparisons, when appropriate, to make results actionable.



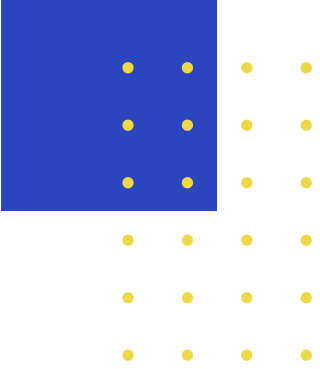
TRAP #2 – ONE-SIZE-FITS-ALL EXPLANATIONS



TRAP #2 – ONE-SIZE-FITS-ALL EXPLANATIONS

"Tailoring Data to the Person, Not Just the Problem"

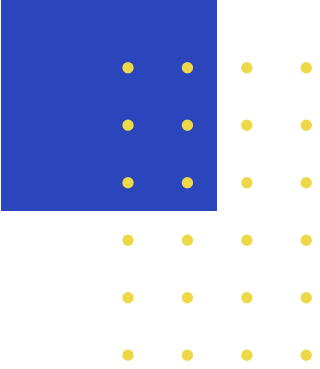




TRAP #2 – ONE-SIZE-FITS-ALL EXPLANATIONS

Why do tailored solutions matter?

- Executives, directors, and front-liners don't think the same way



TRAP #2 – ONE-SIZE-FITS-ALL EXPLANATIONS

Your audience... Ultimately,
everything you do when you
plan, create and deliver content
is for them.

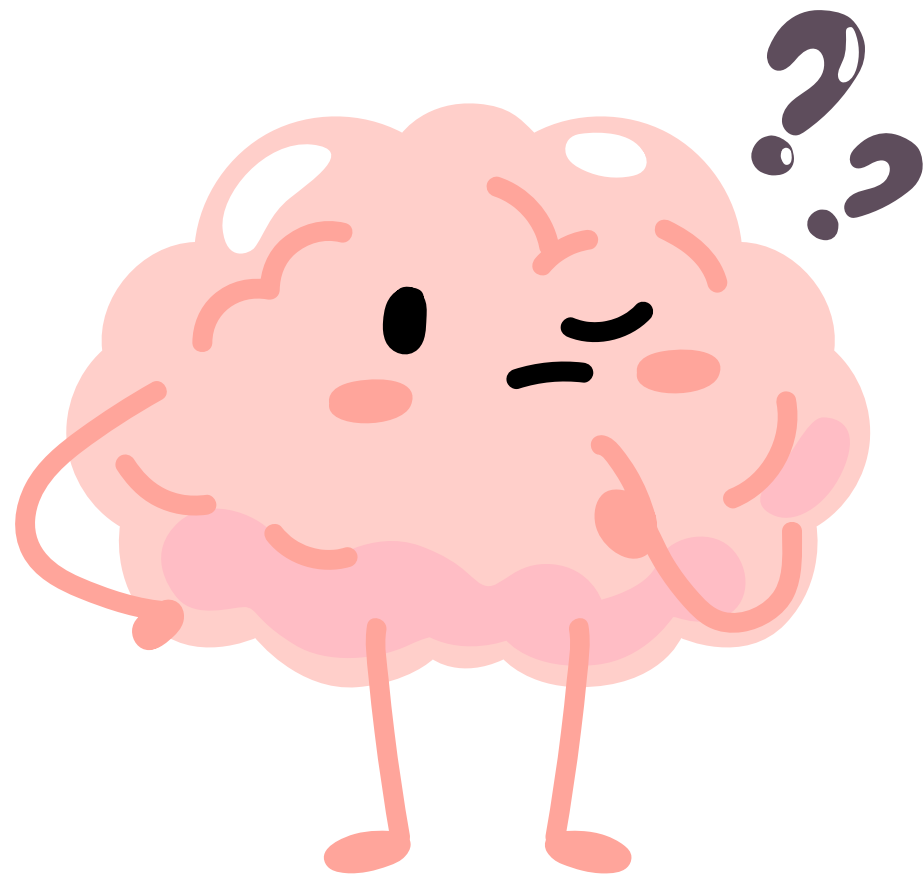
Cole Nussbaumer Knaflie
Storytelling with You

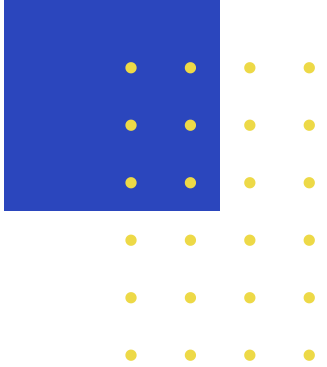


TRAP #2 – ONE-SIZE-FITS-ALL EXPLANATIONS

Scenario Mapping:

- First-year retention is down 3% YoY





TRAP #2 – ONE-SIZE-FITS-ALL EXPLANATIONS



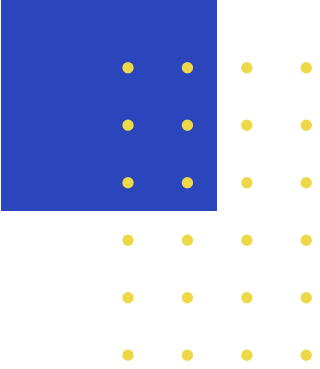
Provost:

First-year retention has dropped 3 percentage points compared to last year, which likely means fewer students progressing toward graduation. I recommend we dig into whether the decline is concentrated in specific colleges, student groups, or course patterns

Advisor:

Retention for your first-year advisees is down 3% compared to last year, meaning more of your students are stopping out or transferring after year one. Let's identify which students are at higher risk so you can prioritize proactive outreach, check-ins around critical milestones, and referrals to campus resources.





TRAP #2 – ONE-SIZE-FITS-ALL EXPLANATIONS

Three-step guide

Help prioritize your audience and tailor solutions.



1. Start With Who and Why

- Ask: Who is my audience, and what do they care about most right now?
- Capture their role, goals, and what's at stake for them if nothing changes.
- Write a one-line “audience goal” (for example: “Help program directors spot at-risk courses before enrollment closes”).



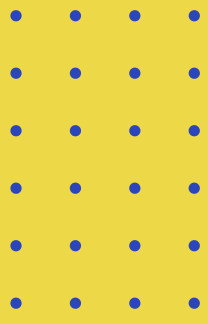
2. Clarify Decisions and Actions

- Ask: What specific decision should this help you make, or what action should it enable?
- Push past vague answers like “visibility” to concrete ones like “decide which courses to cancel, cap, or promote.”
- Turn that into a clear call to action you design toward (for example: “By the end, you should know which 10 courses need intervention this week”).



3. Design to Reduce Audience Effort

- Choose only the views, filters, and metrics that directly support that decision; hide everything else.
- Make the “so what?” obvious: highlight key signals, annotate important insights, and place recommendations up front.
- Do a quick check: Can a typical audience member understand what matters and what to do in under 1 minute? If not, simplify.



TRAP #3 – WHY TECHNICAL DETAIL ISN'T ENOUGH

**TRAP #3 – WHY TECHNICAL
DETAIL ISN'T ENOUGH**

"From 'How' to 'Why and So What'"





TRAP #3 – WHY TECHNICAL
DETAIL ISN'T ENOUGH

30 • HUMANIZING DATA SYSTEMS

all team members when they're required to act in a certain way but don't know how yet.

"Hat to wear"	Situation (examples)	Objective (examples)	Skills to apply (examples)
Therapist	Requirements clarification	Understanding and quantifying the pain points of stakeholders	Empathy, Active listening, Interviewing, Data communication
Project Manager	Scoping and execution of the project	Ensuring project success	Project management, stakeholder management
Negotiator	Agreeing on collaboration	Define operating model	Empathy, conflict management
Detective	Investigation of data problems	Identify root causes and define sustainable solutions	Critical thinking, structured working, SQL, Python
Communicator	Townhall presentation	Getting wider stakeholder buy-in	Presentation, public speaking, data visualization
Developer	Writing a SQL query	Define technical business rules	SQL, Tool navigation, DataOps
Mediator	Navigating conflict between different data parties	Reach agreement for policy	Conflict management, empathy, active listening



These “hats” help analysts prepare for the interactions they have with different collaborators.

TRAP #3 – WHY TECHNICAL DETAIL ISN'T ENOUGH

Collaboration is more important than ever in data because despite how the data team was seen in the past, we realize that data is everyone's responsibility and that people who don't have data in their job title might have much more impact and influence on data than those that have official data roles.

- Feng (2024, p. 33)



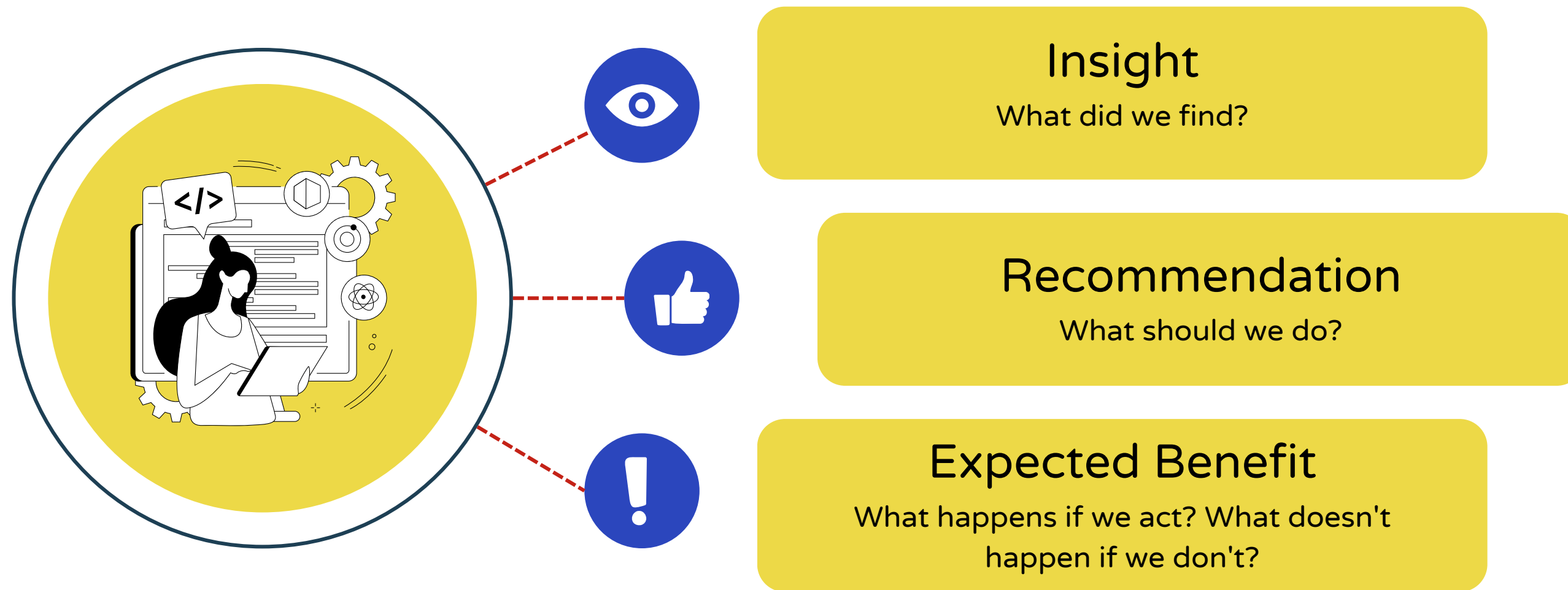
Data Team

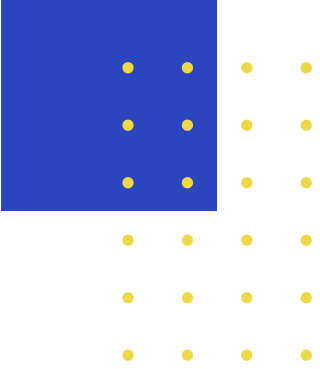


Collaborators

TRAP #3 – WHY TECHNICAL DETAIL ISN'T ENOUGH

What stakeholders actually want: Meaning, impact, the "so what"

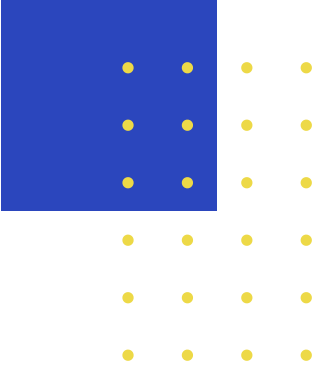




TRAP #3 – WHY TECHNICAL DETAIL ISN'T ENOUGH

What stakeholders actually want: Meaning, impact, the "so what"

- “What changes if we act on this?”
- “What stays the same if we ignore this?”



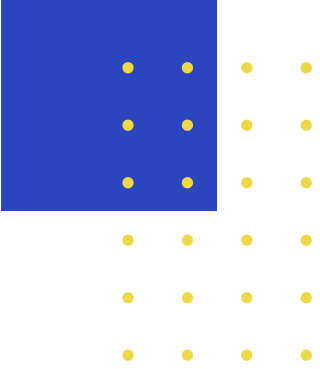
TRAP #3 – WHY TECHNICAL DETAIL ISN'T ENOUGH

Example

"We have 500 missing prerequisite codes"

VS

"This is causing 15% of registration holds, delaying student enrollment by 2 weeks"



TRAP #3 – WHY TECHNICAL DETAIL ISN'T ENOUGH

Insight → Recommendation → Expected Benefit

A framework



1. Start with the Insight

- Clearly state the key finding in plain language (for example: “First-year retention is down 3% YoY”).
- Add just enough context (who, where, when) so someone new could understand it without the full report.



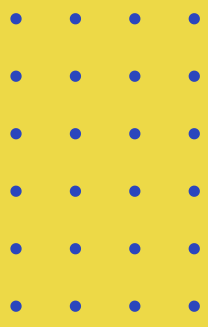
2. Add a Concrete Recommendation

- Translate the insight into a specific next step (for example: “Prioritize outreach to first-year students with low credits and missing advising appointments”).
- Make the recommendation something a real person or team can actually do in the next week or month.



3. Spell Out the Expected Benefit

- Describe what improves if they follow the recommendation (for example: “We expect to recover 1–2 percentage points of retention among this at-risk group”).
- Also check: what cost or risk do we accept if we ignore this insight and change nothing?



TRAP #4 – NOT DEFINING THE REAL PROBLEM

TRAP #4 – NOT DEFINING
THE REAL PROBLEM

"Ask 'Why' Before You Query:
The 5 Whys & How Might We"

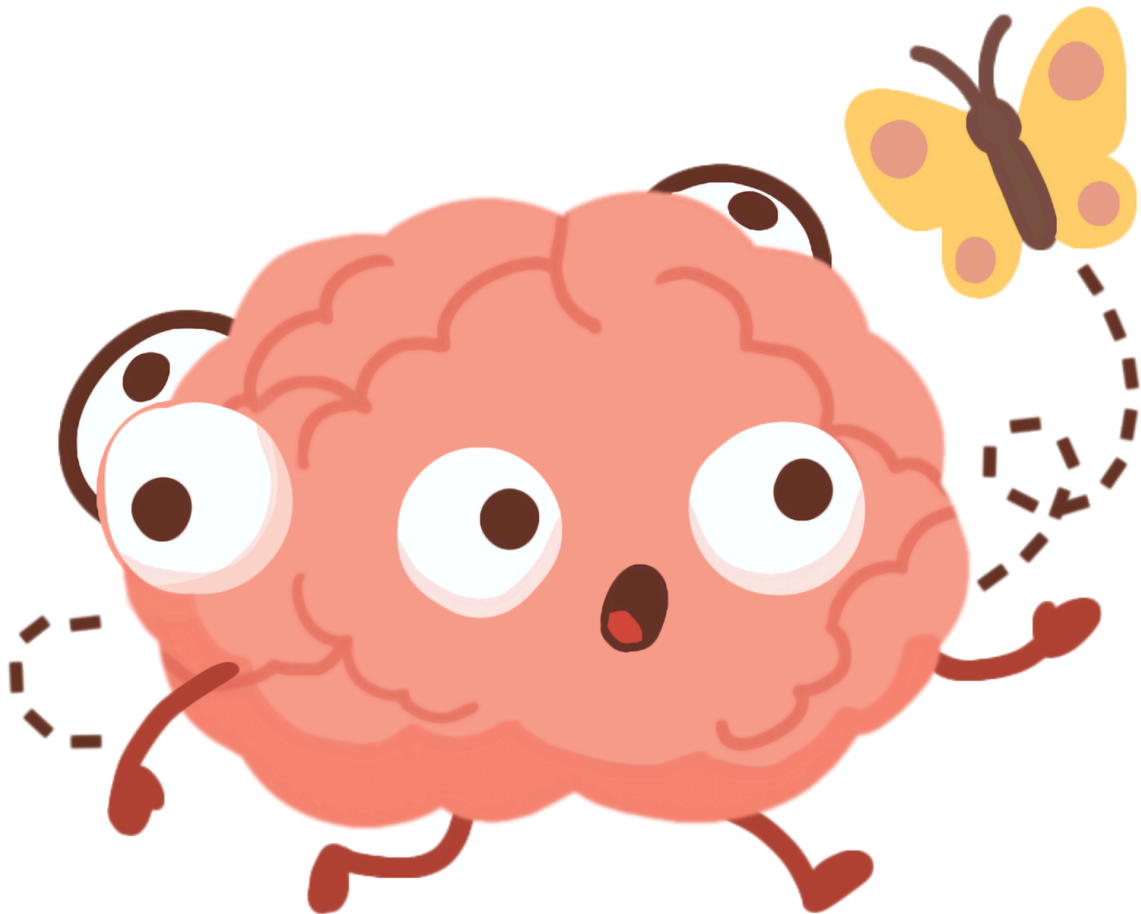


TRAP #4 – NOT DEFINING THE REAL PROBLEM

Design for the “Big Eyeball Brain”

Stakeholders process information
visually first—the story lands
before words or numbers.

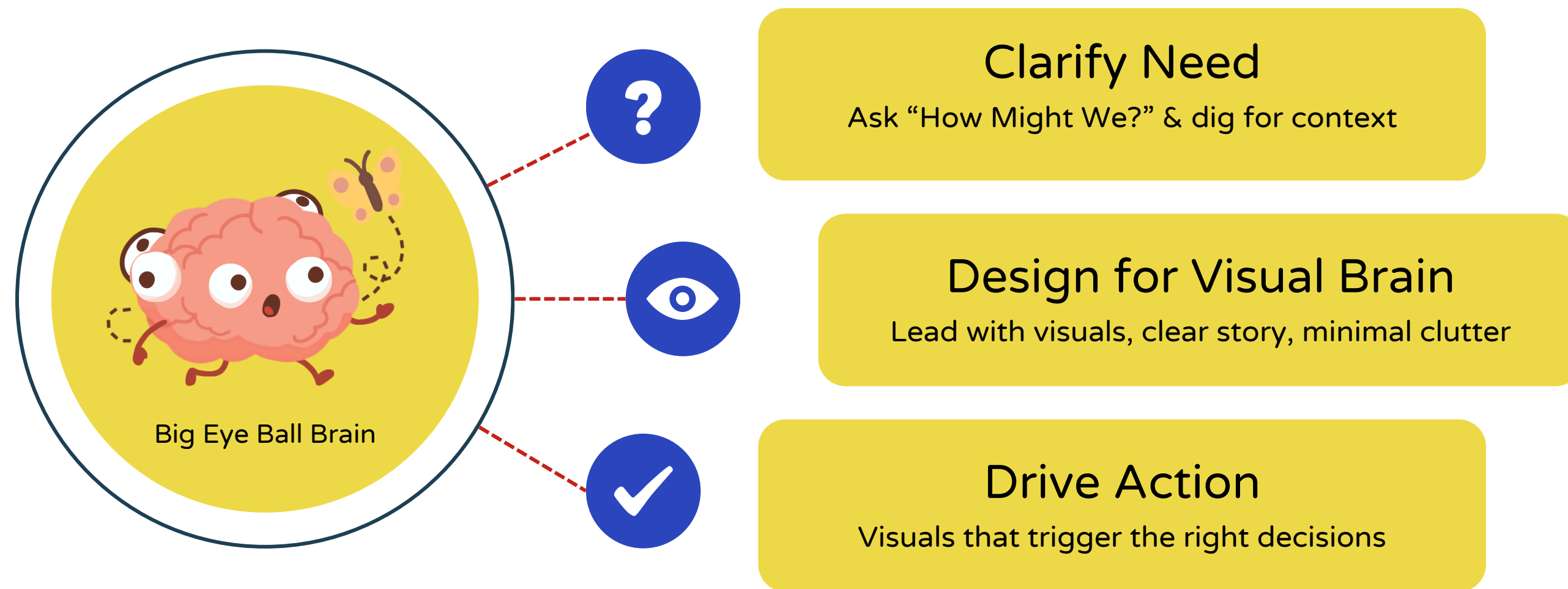
Credit goes to Stephanie Green

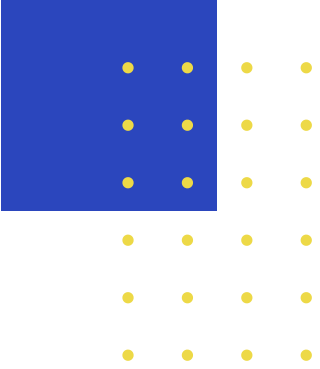


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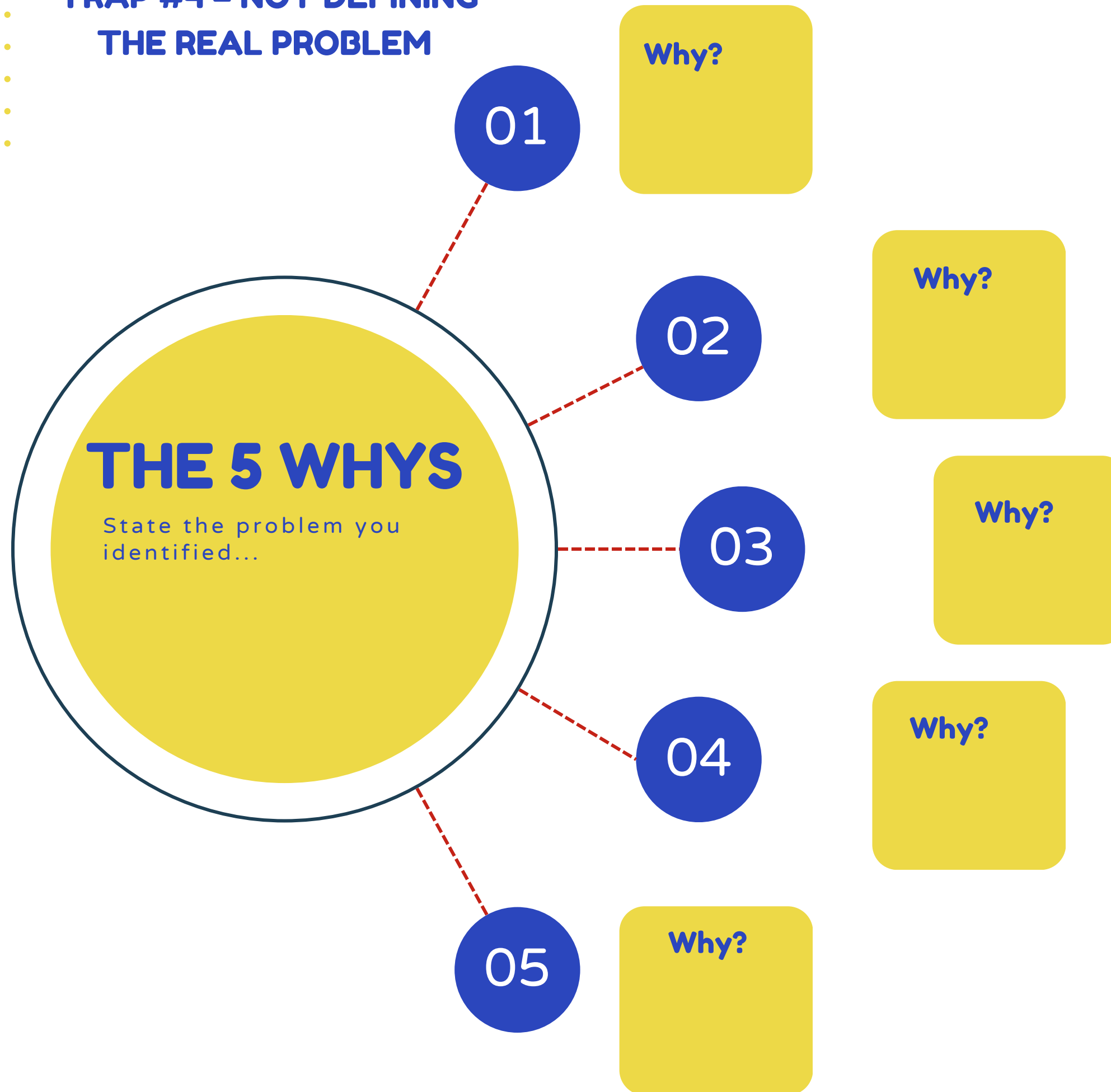


TRAP #4 – NOT DEFINING THE REAL PROBLEM

Why does this matter?

- You have a better chance at solving the real problem.
- Save time by figuring it out early on.

TRAP #4 – NOT DEFINING THE REAL PROBLEM



Keep asking "Why?"
until you hit root
cause.

TRAP #4 – NOT DEFINING THE REAL PROBLEM



TRAP #4 – NOT DEFINING THE REAL PROBLEM

How do the 5 Whys shapes your data response?

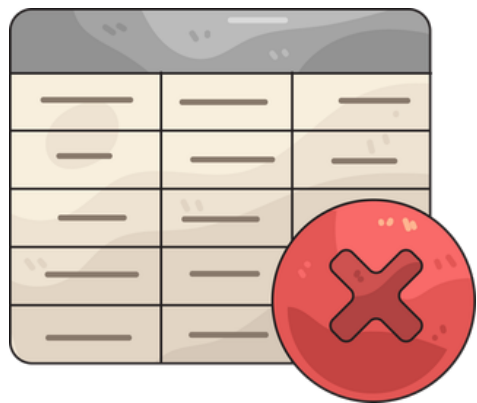
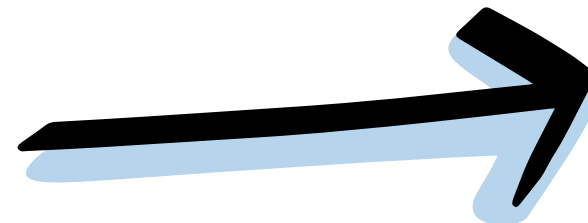
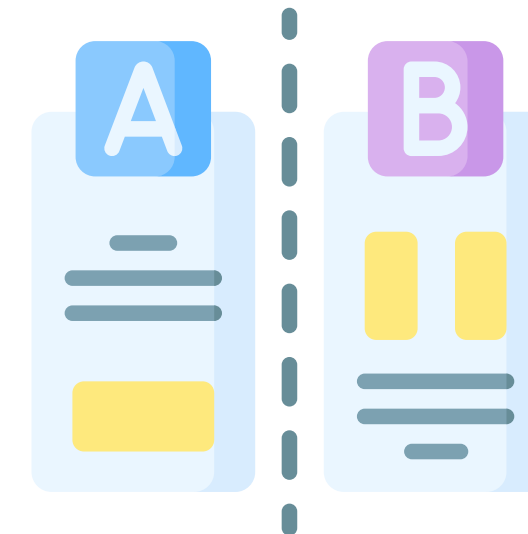


Table of Headcounts



Enrollment Trends
(majors and courses)

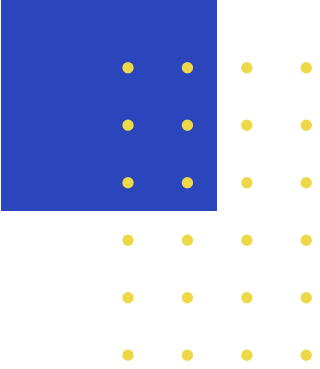


Comparisons with
similar-sized programs

TRAP #4 – NOT DEFINING THE REAL PROBLEM

Clarifying the problem and tailoring the data leads to...





TRAP #4 – NOT DEFINING THE REAL PROBLEM

Clarifying the problem with 5 Whys and tailoring the data can shift the department from anxiety to action.

- ✓ More control, less fear
- ✓ Better conversations with leadership
- ✓ Clear priorities and alignment

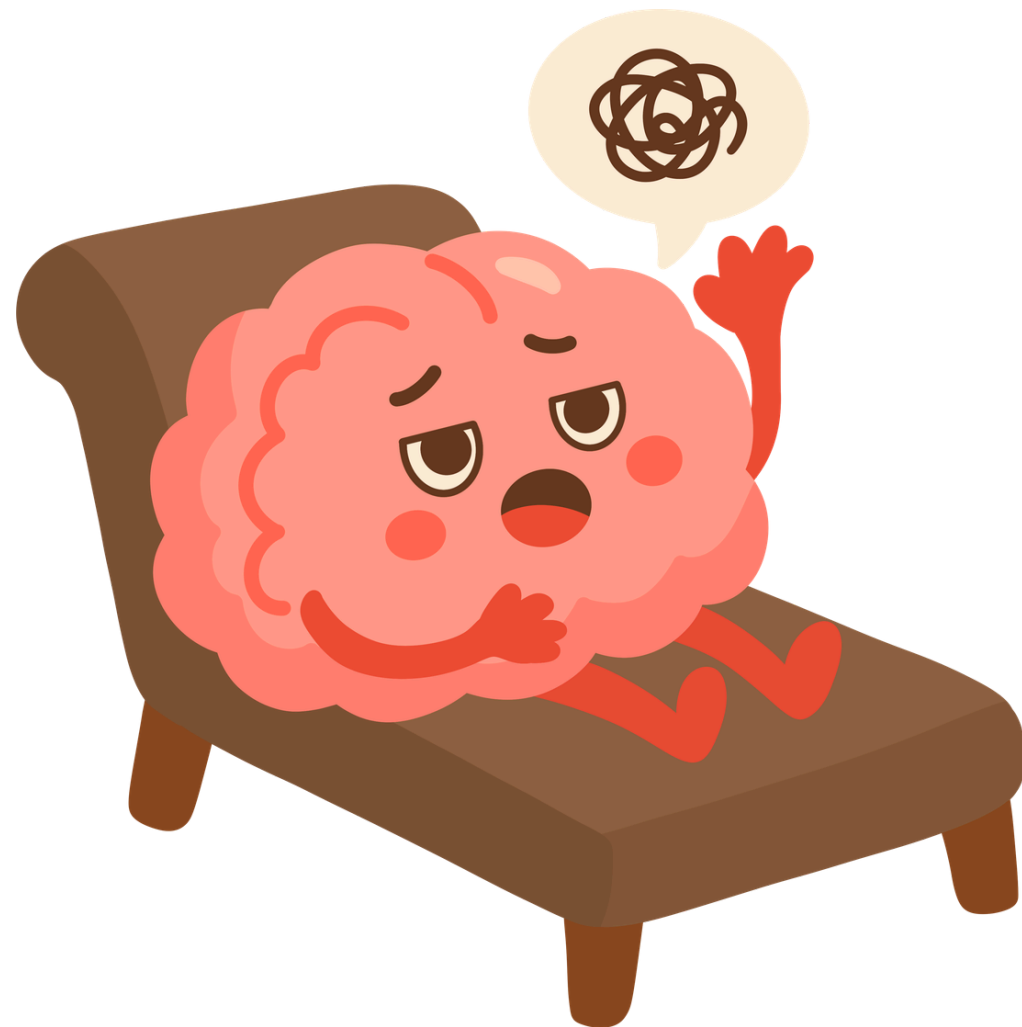
How Might We (HMW)

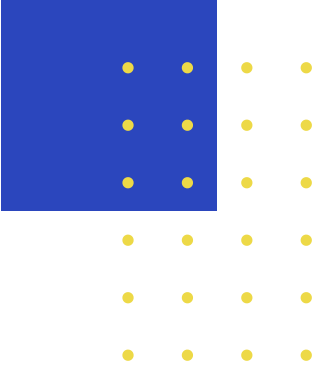
Reframe problems as collaborative questions

- HMW surface insights for advisors w/o overwhelming dashboards?
- HMW involve stakeholders earlier in BI design?
- HMW make conversations, not visuals, the driver of decisions?

Discovery Interviews

- Run short discovery interviews with users to validate the real problem.





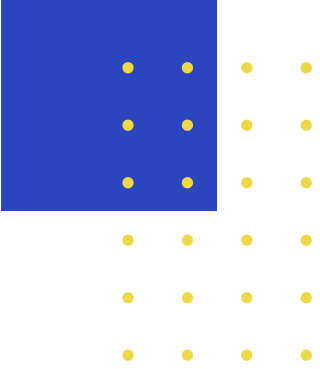
TRAP #4 – NOT DEFINING THE REAL PROBLEM

Discovery Interviews are important for...

- Understanding people's goals, pain points, workarounds, and environment in their own words.
- Revealing assumptions, edge cases, and constraints you would miss in surveys alone.

Using HMW with discovery

- Run discovery interviews with broad, non-leading questions
 - “Tell me about...”, “Walk me through...”, “What’s hardest about...?”
- Cluster what you learn into user needs and opportunity areas.
- Translate those into HMW questions
 - “How might we help advisors see the full student picture at a glance?”



TRAP #4 – NOT DEFINING THE REAL PROBLEM

Ask “Why” Before You Query

A guide



1) Why this matters

- Jumping straight into SQL or dashboards often answers the request, not the real problem.
- Slowing down to ask “why” helps you design solutions that change decisions and outcomes, not just create prettier reports.



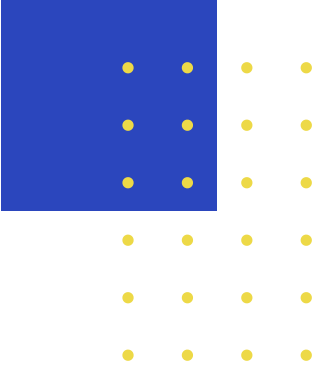
2) Two tools to get past the surface

- The 5 Whys: Start with the request (“We need enrollment data”) and keep asking “Why?” until you uncover the root cause (for example, unclear goals, missing process, or lack of accountability).
- How Might We (HMW): Turn problems into collaborative questions, such as: “How might we surface insights for advisors without overwhelming dashboards?”



3) Discovery interviews: your secret weapon

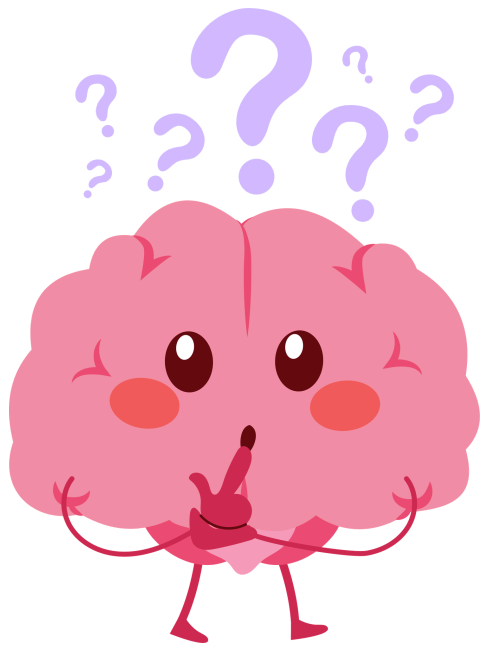
- Before you build, have 2–3 short conversations with different stakeholders to hear their goals, pain points, and definitions of success in their own words.
- Use what you learn to refine your 5 Whys and HMW questions, so your queries and reports are clearly tied to real needs rather than assumptions.

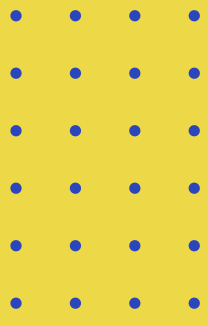


TRAP #4 – NOT DEFINING THE REAL PROBLEM

Request: “I need a dashboard on financial aid disbursements.”

What “Whys” of HMWs would you ask?





TRAP #5 – WORKING IN ISOLATION

"Show Your Work: Why Collaboration Changes Everything"



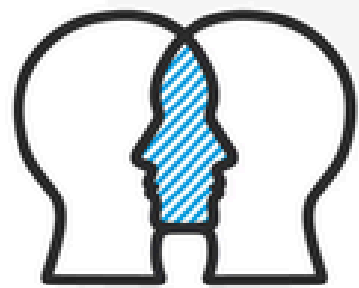






The Better Way

Design Thinking



Empathize



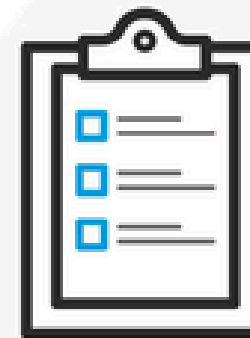
Define



Ideate



Prototype



Test



Interaction Design Foundation
interaction-design.org

The Tactics



1. Share ugly drafts early
2. Conduct peer reviews with other analysts
3. Check in with stakeholders regularly and early
4. Iterate!

TRAP #5 – WORKING IN ISOLATION

Learn Design From the Best

IxDF – Global Leader
in Design Education
Founded in 2002



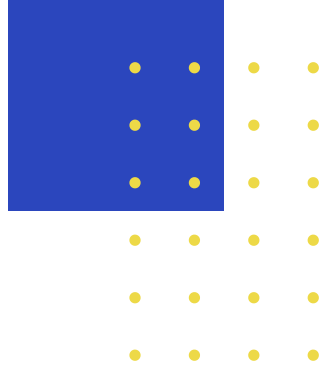
UX / UI Design Blog: Expert Trends, AI Tools & Career Guides

The world's most trusted UX / UI design blog. Expert insights on AI-augmented design, spatial UI, and career growth from design leaders.



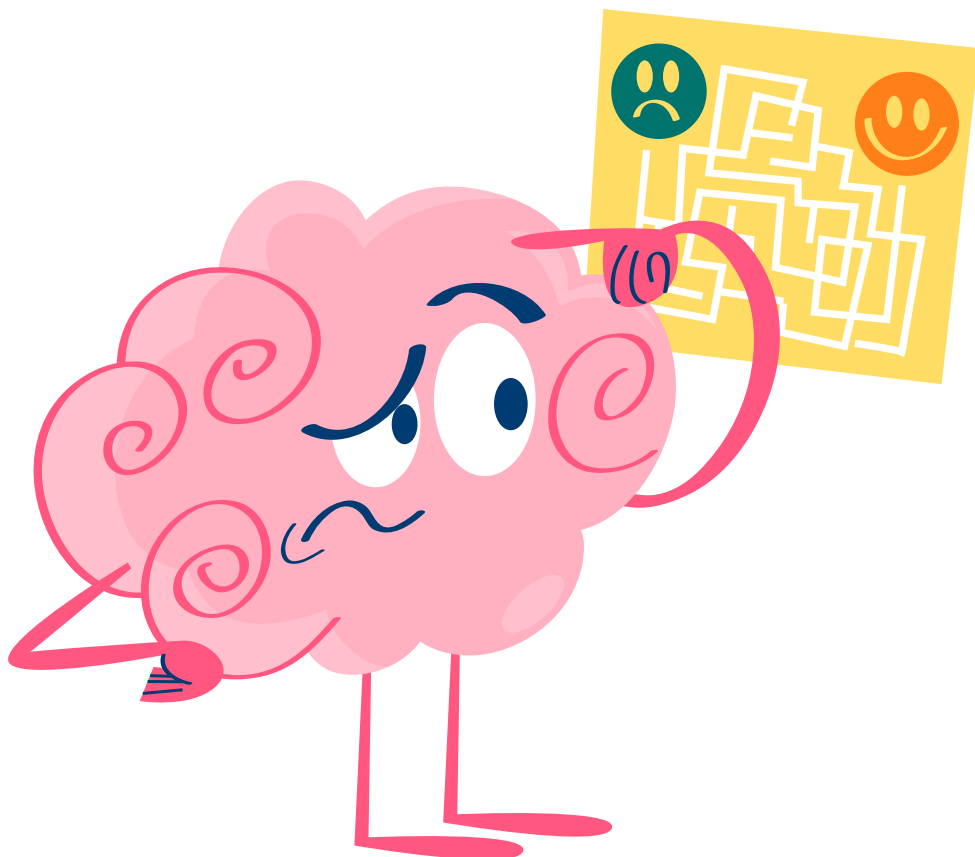
IxDF

<https://www.interaction-design.org/literature/article/free-ux-design-courses>



TRAP #5 – WORKING IN ISOLATION

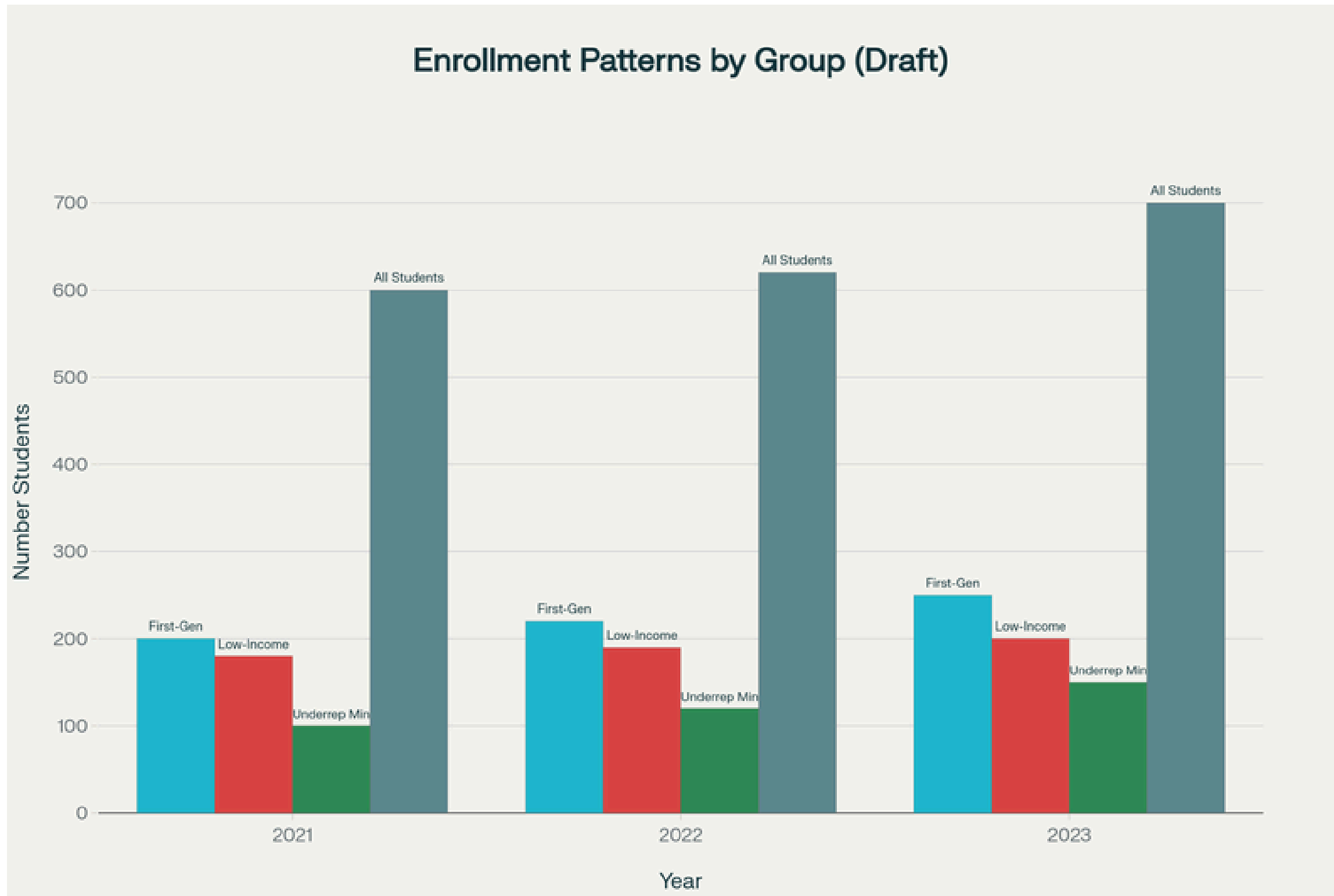
Rapid Engagement Activity: "Real-Time Feedback Poll"



TRAP #5 – WORKING IN ISOLATION

3 MIN

1. What's working in this draft?
2. What's confusing or unclear?
3. What's one change that would make this better ?



TRAP #5 – WORKING IN ISOLATION

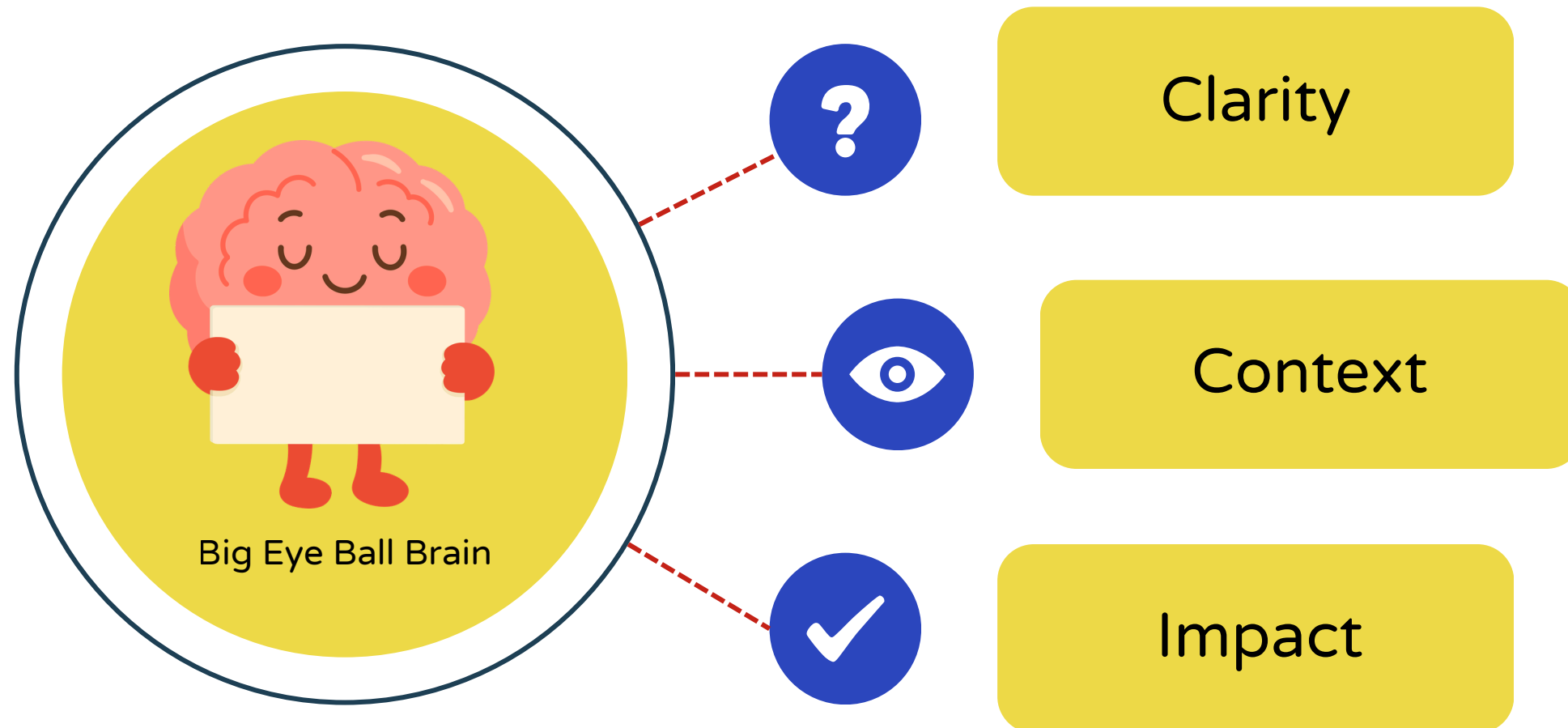
1. What's working in this draft?
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Enrollment is increasing consistently amongst all three student groups

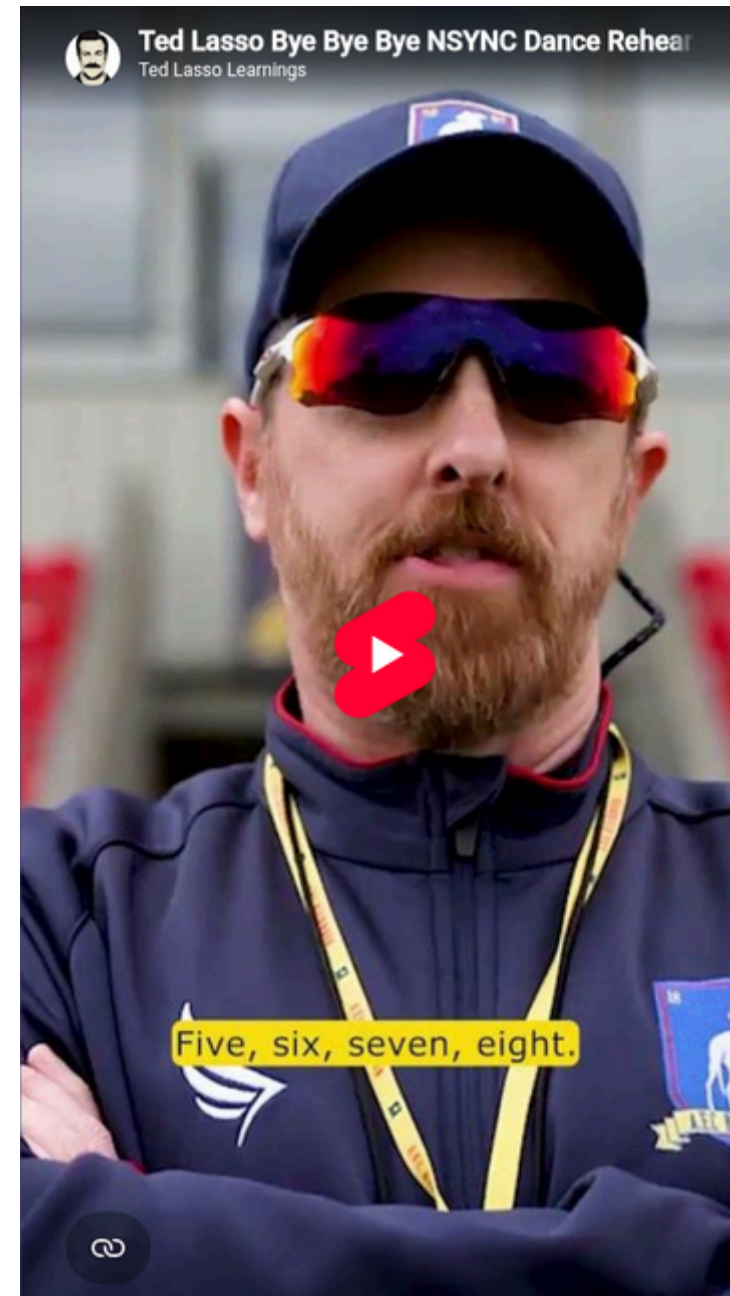


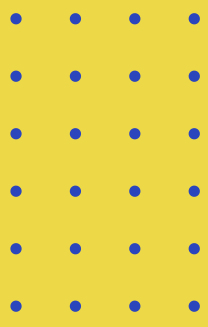
TRAP #5 – WORKING IN ISOLATION

Not working in isolation results in...

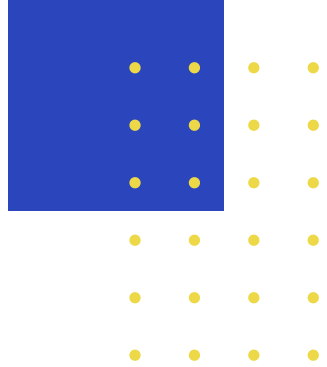


TRAP #5 – WORKING IN ISOLATION



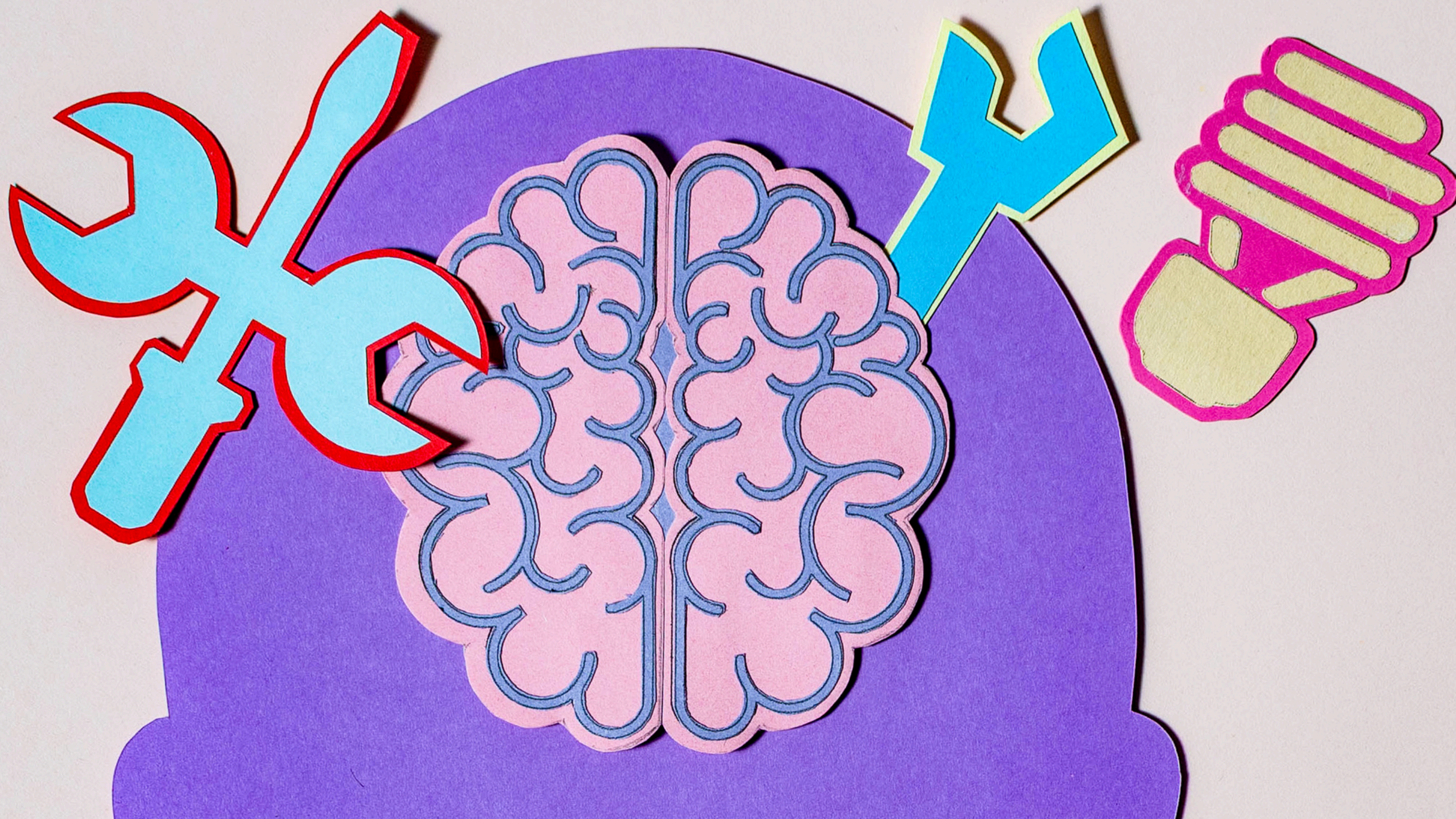


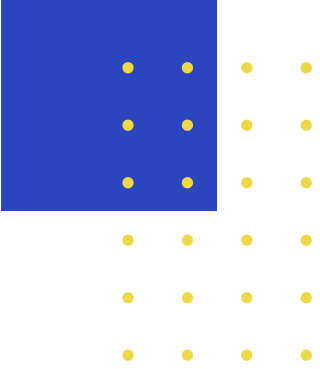
PUTTING IT TOGETHER – THE HUMAN-CENTERED FRAMEWORK



PUTTING IT TOGETHER

"Five Principles, One Simple Mindset"





HUMANIZING DATA ANALYSIS

5 Common Traps

01

Trap #1 – Starting with the Tool, Not the Problem

02

Trap #2 – One-Size-Fits-All Explanations

03

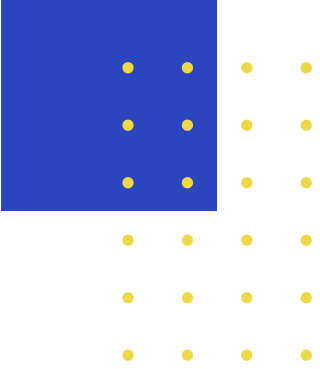
Trap #3 – Why Technical Detail Isn't Enough

04

Trap #4 – Not Defining the Real Problem

05

Trap #5 – Working in Isolation



HUMANIZING DATA ANALYSIS

5 Fixes

01

Stop Chasing Shiny—Start Asking Better Questions

Ask “what decision stuck?” before opening Tableau or Power BI.
Match to tool to the need (sometimes Excel will do just fine).

02

Tailor the Data to the Person, Not Just the Problem

VPs and Program Coordinators don’t think the same.
Share the same data but in different ways.

03

From 'How' to 'Why and So What'

The Insight → Recommendation → Expected Benefit
What did we find? What should we do? What happens if we act?

04

Ask “Why” before you query or visualize

Keep asking “Why?” until you hit root cause.
Reframe problems as collaborative questions (HMW).

05

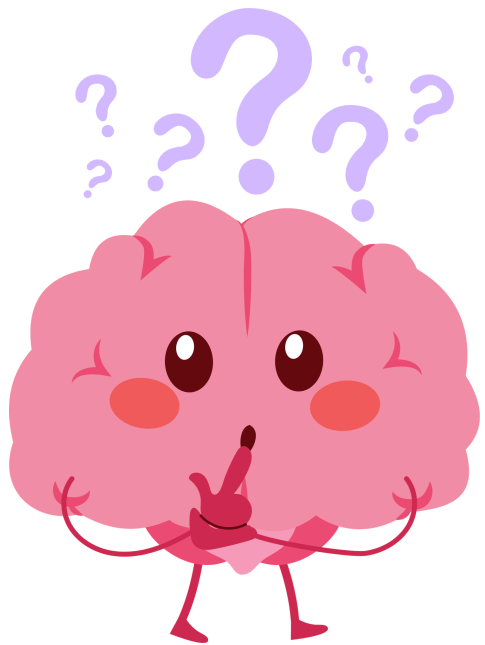
Show Your Work: Collaboration Changes Everything

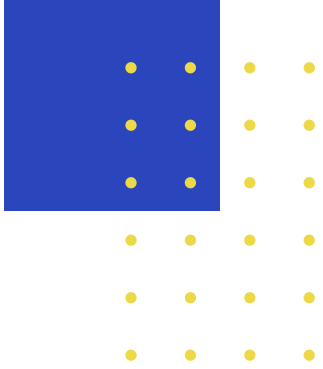
Discovery → Define → Design → Deliver
Share ugly drafts, conduct peer reviews, check in with stakeholders,
and iterate.





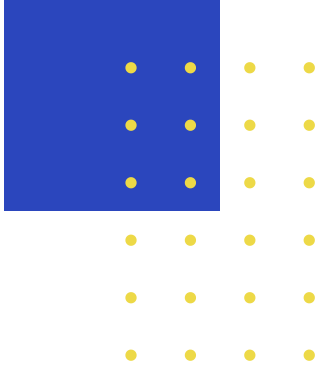
How might you define Data Analysis?





"Your Questions, Your Stories"





Stay
Connected
& Keep
Learning



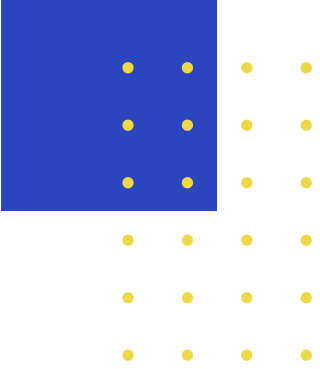
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[@https://www.linkedin.com/in/anna-kourouniotis](https://www.linkedin.com/in/anna-kourouniotis)



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