THE PARADOX AUDITOR

Metric Trees + Funnel Analysis + Simpson's Paradox

1. The Three Frameworks Used:

METRIC TREES	FUNNEL ANALYSIS	SIMPSON'S PARADOX
Break a top-line number into the sub-metrics that mathematically drive it, so you can see where a change came from.	Follow users step by step through a process, measuring drop-off at each stage.	A trap where a trend appears in the overall data but reverses when you split the data into groups.

How the Three Connect (Fusion Logic)

Metric trees and funnels take a big number apart. Simpson's Paradox is the warning that the aggregate number can point in exactly the wrong direction. Fused, they force you to check every conclusion at the segment level before acting on it.

2. Application: UC BERKELEY ADMISSIONS (THE CLASSIC CASE)

Background — What Happened and Why

- In the 1970s, UC Berkeley's overall admissions data appeared to show men were admitted at a higher rate than women.
- Taken at face value, the aggregate number suggested bias against women applicants.
- Acting on that headline number would have meant fixing the wrong problem entirely.
- The truth only appeared when the data was split by department.

What They Did

- Broke the aggregate admission rate down department by department instead of trusting the total.
- Found that within most individual departments, women were admitted at similar or *higher* rates.
- Discovered the real driver: women applied in greater numbers to departments that were more competitive for everyone.
- Recognised the aggregate had reversed the truth — a textbook Simpson's Paradox.

Applying the Fusion — Step by Step

1 **Question the overall number**

The overall figures suggested men were admitted more than women — but acting on that headline number would have meant fixing the wrong problem.

2 **Break the number down by group**

Instead of trusting the total, the data was split department by department to see what was really happening underneath.

3 **Find the real cause in the split**

Within most individual departments, women were admitted at similar or higher rates. The real driver was that women applied more to the most competitive departments.

4 **See the aggregate reversed the truth**

The overall number pointed the opposite way to the truth — a classic case where a total hides what the groups actually show.

The Result

The problem was not the admission decision at all — it was the distribution of applications across departments. Splitting the funnel changed the diagnosis completely, and with it the correct action.

3. Key Takeaways

- A blended metric can rise while every part of the business declines — mix shift is the silent editor.
- Put mix into the metric tree as a named node, or it will hide inside averages forever.
- Mix-adjusted comparisons should be standard in any fast-growing, multi-segment business.
- Use whenever growth changes your customer, city, or channel composition — which is always.