Turning Raw Data into Strategic Decisions

Business Analytics - Chapter 11

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Agenda

1. The Executive's Dilemma: Why data alone is not enough.
2. The Art of Storytelling: Context, Narrative, and Visuals.
3. Analytical Frameworks: KPI Trees, Funnel, Cohort.
4. Dashboard Design: Principles & Layouts.
5. The Metric Layer: The modern architecture.

The Executive's Dilemma

The Reality: Executives are 'Data Rich' but 'Insight Poor'.

Pain Points:

- Information Overload: Too many reports.
- Analysis Paralysis: Data without direction.
- Trust Issues: Conflicting numbers across departments.

Your Role: Not a 'Report Generator' but a 'Decision Catalyst'.

The Data Storytelling Triangle

1. Data: The evidence (Accurate).
2. Visuals: The lens (Accessible).
3. Narrative: The context (Meaning).

The Intersections:

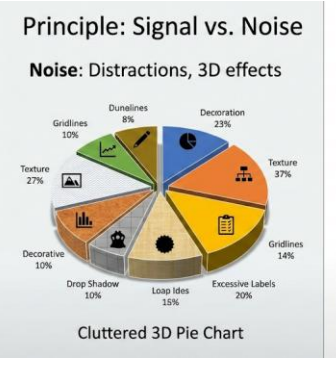
- Data + Visuals = Enlighten.
- Data + Narrative = Explain.
- Visuals + Narrative = Engage.
- Data + Visuals + Narrative = CHANGE (Actionable Insight).

Structure of a Data Story

1. Context (The Setup): Where are we? (e.g., Q3 Target: $5M).
2. Conflict (The Analysis): What changed? (e.g., Missed target by 15% due to Mobile App drop).
3. Resolution (The Action): What now? (e.g., Fix UI bug, expect +$500k recovery).

Principle: Signal vs. Noise

- Signal: Info that aids decision-making.
- Noise: Clutter (3D effects, excessive gridlines).
- Data-Ink Ratio (Edward Tufte):
- Maximize ink for data, minimize ink for decoration.
- Rule: If it doesn't support the story, remove it.



Know Your Audience

C-Level (CEO/CFO):

- Focus: Strategy, ROI, Trends.
- Tool: Executive Summary Dashboard.

Managers:

- Focus: Operations, Tactics.
- Tool: Operational Dashboard (Drill-down).

Analysts:

- Focus: Root cause, Granular data.
- Tool: Exploratory Reports.

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From 'What' to 'So What?'

Level 1: Descriptive (What happened?) -> Revenue down 5%.

Level 2: Diagnostic (Why?) -> East Region underperformed.

Level 3: Predictive (Future?) -> Will miss yearly goal.

Level 4: Prescriptive (Action?) -> Allocate budget to West Region.

Takeaway: Executives pay for Level 4.

The Analyst's Toolkit

Before visualization, we need Mental Models.

4 Core Frameworks:

1. KPI vs. Metrics.
2. KPI Driver Trees.
3. Funnel Analysis.
4. Cohort Analysis.

Metrics vs. KPIs

Metric: Anything measurable (e.g., Page views, Likes).

KPI: Strictly tied to strategic objectives (e.g., CAC, Net Profit).

Quote: 'If everything is important, nothing is important.'

Limit KPIs to 3-5 per dashboard.

The KPI Driver Tree

Concept: Deconstructing a primary goal into mathematical components.

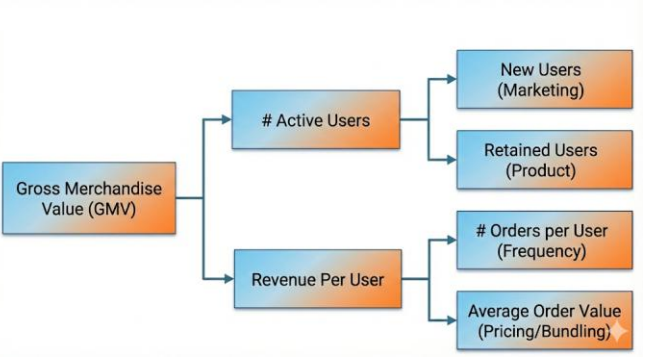
Purpose: Root Cause Analysis.

Logic:

- Additive (+): Total Cost = Fixed + Variable.
- Multiplicative (x): Revenue = Traffic x Conversion x Price.

Example: E-Commerce Driver Tree

- Top Level: Gross Merchandise Value (GMV).
- Branch 1: # Active Users (Drivers: New vs Retained).
- Branch 2: Revenue Per User (Drivers: Frequency, AOV).
- Use this to isolate which branch is underperforming.



Using the Driver Tree for Storytelling

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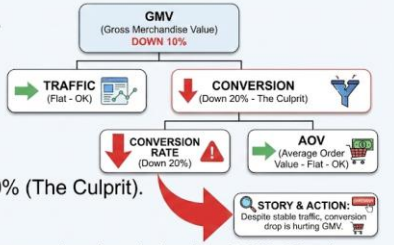
Scenario: GMV is down 10%.



Analysis:

- Traffic is flat (OK).
- AOV is flat (OK).
- Conversion Rate is down 20% (The Culprit).

Story: Despite stable traffic, conversion drop is hurting GMV. Check the checkout process.

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Funnel Analysis

Concept: Mapping customer journey (AIDA Model).

Goal: Identify Bottlenecks (Drop-off points).

'Leaky Bucket' Theory: Don't pour marketing budget into a leaky product funnel.

Funnel Metrics

Conversion Rate (CR): % moving Step A to B.

Drop-off Rate: % lost at a step.

Case Study:

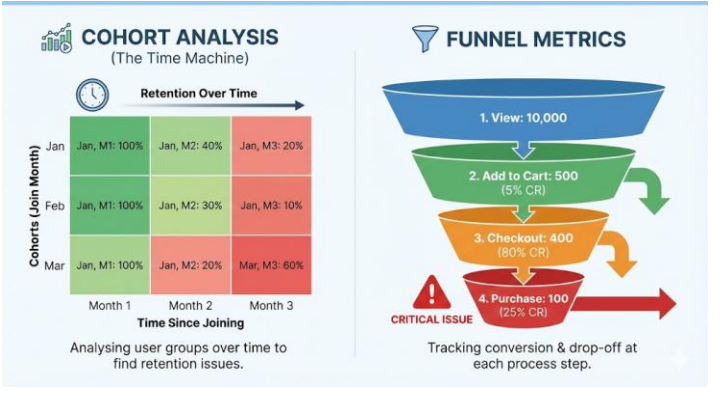
1. View: 10,000
2. Add to Cart: 500 (5% CR)
3. Checkout: 400 (80% CR)
4. Purchase: 100 (25% CR -> CRITICAL ISSUE).

Visualizing Funnels

- Chart Type: Bar chart (horizontal) or Funnel Chart.
- Best Practice: Always display both the Absolute Number (N) and the Conversion % between steps.

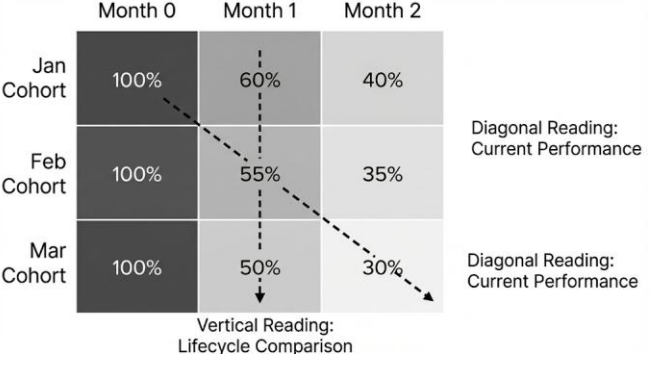
Cohort Analysis (The Time Machine)

- Definition: Analyzing a group of users sharing a characteristic (e.g., join date) over time.
- Why? Aggregate metrics hide retention issues.
- Application: Measuring Retention, Churn, and LTV.



How to Read a Cohort Heatmap

- Rows (Y): Cohorts (Jan, Feb, Mar).
- Columns (X): Time elapsed (Month 0, 1, 2).
- Values: Retention Rate (%).
- Diagonal Reading: Current performance.
- Vertical Reading: Lifecycle comparison.



Interpreting Cohort Data

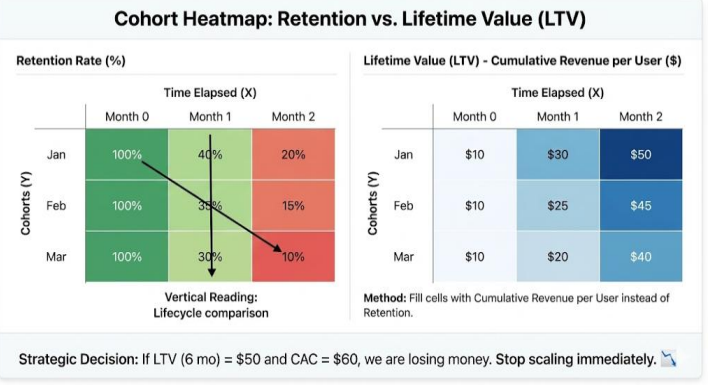
Example:

- Jan Cohort: Month 1 Retention = 40%
- Feb Cohort: Month 1 Retention = 20%

Story: Feb users are half as likely to return. Did we change marketing channels? Is user quality lower?

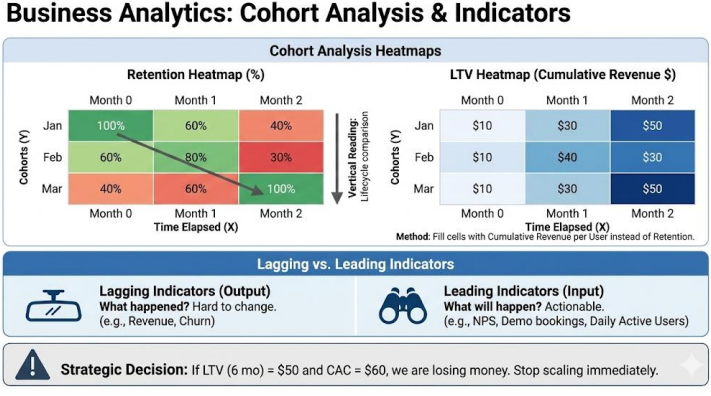
Cohorts & Lifetime Value (LTV)

- Method: Fill cells with Cumulative Revenue per User instead of Retention.
- Strategic Decision: If LTV (6 mo) = $50 and CAC = $60, we are losing money. Stop scaling immediately.



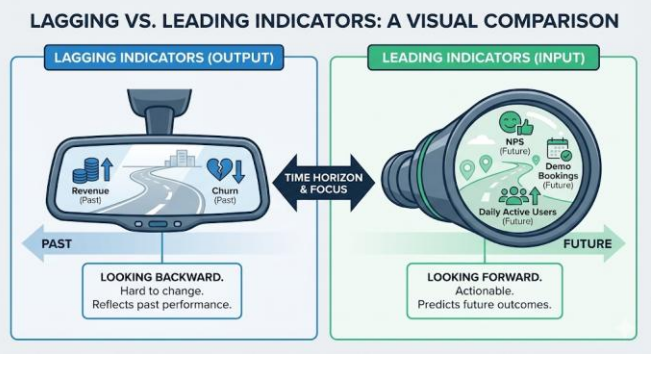
Lagging vs. Leading Indicators

- Lagging (Output): What happened? Hard to change. (e.g., Revenue, Churn).
- Leading (Input): What will happen? Actionable. (e.g., NPS, Demo bookings, Daily Active Users).



The Dashboard Balance

- Lagging tells you the score.
- Leading tells you how to win the next game.
- Recommended Ratio: 60% Lagging / 40% Leading for Executive Dashboards.



Class Activity

Scenario: Data Lead for a SaaS Company.

Task: Define 1 Lagging Metric and 2 Leading Metrics for 'Increase Revenue'.

Example Answers:

- Lagging: MRR.
- Leading: # of Demos, Feature Usage %.

Framework Summary

- KPI Trees: Diagnose WHY.
- Funnels: Optimize PROCESS.
- Cohorts: Understand BEHAVIOR over time.
- Leading Indicators: PREDICT future.

Types of Dashboards

1. Strategic: Executives (Monthly, High-level KPIs).
2. Operational: Managers (Daily, Monitoring).
3. Analytical: Analysts (Ad-hoc, Granular).

The 5-Second Rule

Can a user answer these in 5 seconds?

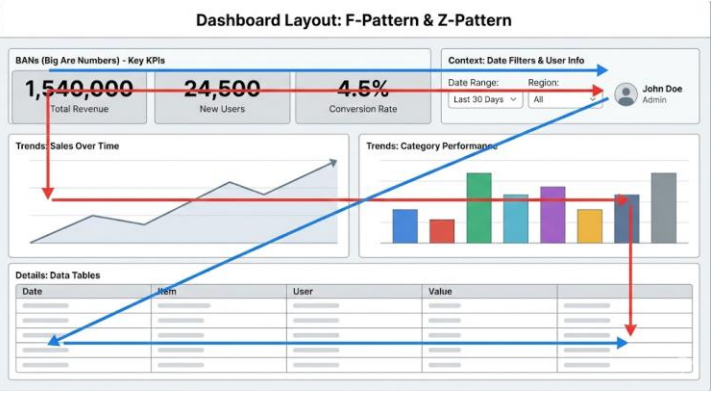
1. Is the business doing well or badly?
2. Where is the problem?

If they have to 'read' the dashboard, the design failed. It must be scannable.

Dashboard Layout

- Top Left: Key KPIs (BANs) - Most valuable space.
- Top Right: Context (Filters).
- Center: Trends (Charts).
- Bottom: Details (Tables).

- Follow F-Pattern or Z-Pattern scanning.



Color Semantics

- Green: Good / On Track.
- Red: Bad / Alert.
- Grey: Context / Neutral.
- Blue: Primary Data.
- Tip: Use color sparingly to highlight anomalies, not for decoration.

Common Design Pitfalls

1. One-Size-Fits-All: Trying to satisfy everyone.
2. Lack of Context: Numbers without targets/comparisons.
3. Wrong Charts: Pie charts for >5 categories.
4. Scroll Fatigue: Keep exec dashboards to one screen.

The Metric Layer

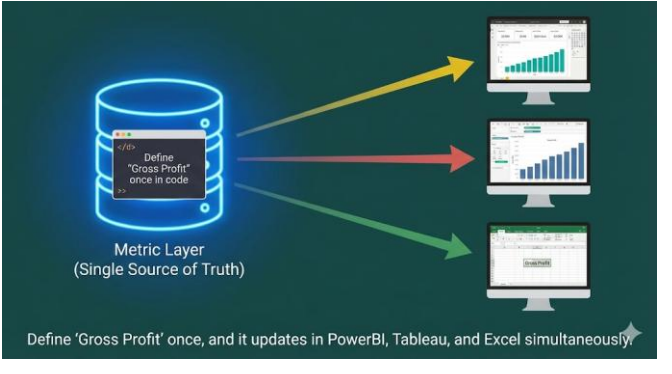
Problem: 'Metric Chaos' (Different logic in Marketing vs Finance).

Solution: A centralized layer between Data Warehouse and BI Tool.

Concept: Define metrics as code (e.g., LookML, dbt).

Metric Layer: What is it?

- A Single Source of Truth.
- Define 'Gross Profit' once in code, and it updates in PowerBI, Tableau, and Excel simultaneously.

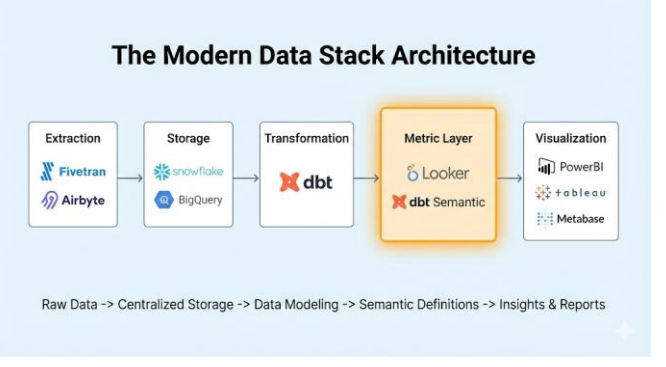


Benefits for Leadership

1. Consistency: Trust in numbers.
2. Self-Service: Executives can build reports safely.
3. Governance: Clear ownership.

The Modern Data Stack

- Extraction (Fivetran) -> Storage (Snowflake) -> Transformation (dbt) -> METRIC LAYER -> Visualization (PowerBI).
- The Metric Layer ensures governance.

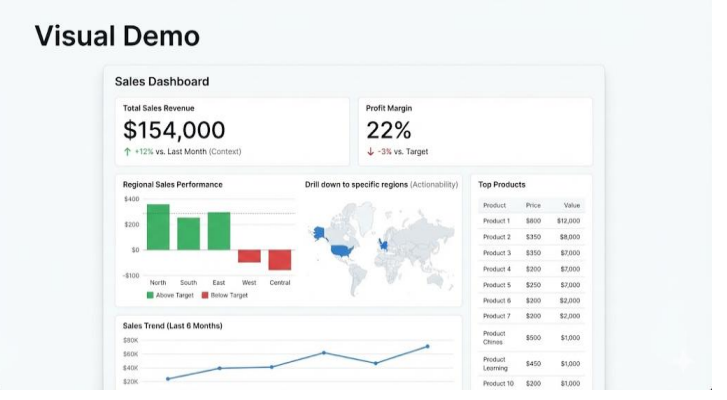


Case Study: The CSO Dashboard

- User: Chief Sales Officer (Quarterly Review).
- Metrics: Revenue, % Quota, Pipeline.
- Visuals:
  - BANs for top metrics.
  - Line chart for Trends.
  - Heatmap for Rep Performance.

Visual Demo

- Note the Context (vs Last Year) and Actionability (Drill-downs).



Key Takeaways

1. Storytelling: Context + Conflict + Resolution.
2. Tools: KPI Tree, Funnel, Cohort.
3. Design: Simplicity, 5-second rule.
4. Architecture: Metric Layer for trust.

Q&A & Homework

Homework:

- Choose an app (Grab/Shopee).
- Draw a KPI Driver Tree for 'Net Profit'.
- Identify a Leading Indicator.

Questions?