From Business Goals to Data-Driven Engineering

Connecting Strategy, Analytics, and Software Engineering

The Core Challenge

Bridging the gap between business strategy and technical implementation to ensure software solves real-world problems.

1. Understand Business Problems

What is the Problem?

Understanding the business problem means identifying what needs to be solved and, more importantly, **why it matters** to the organization.

This critical first step ensures that the final solution aligns with actual business goals rather than just technical interests or symptoms.
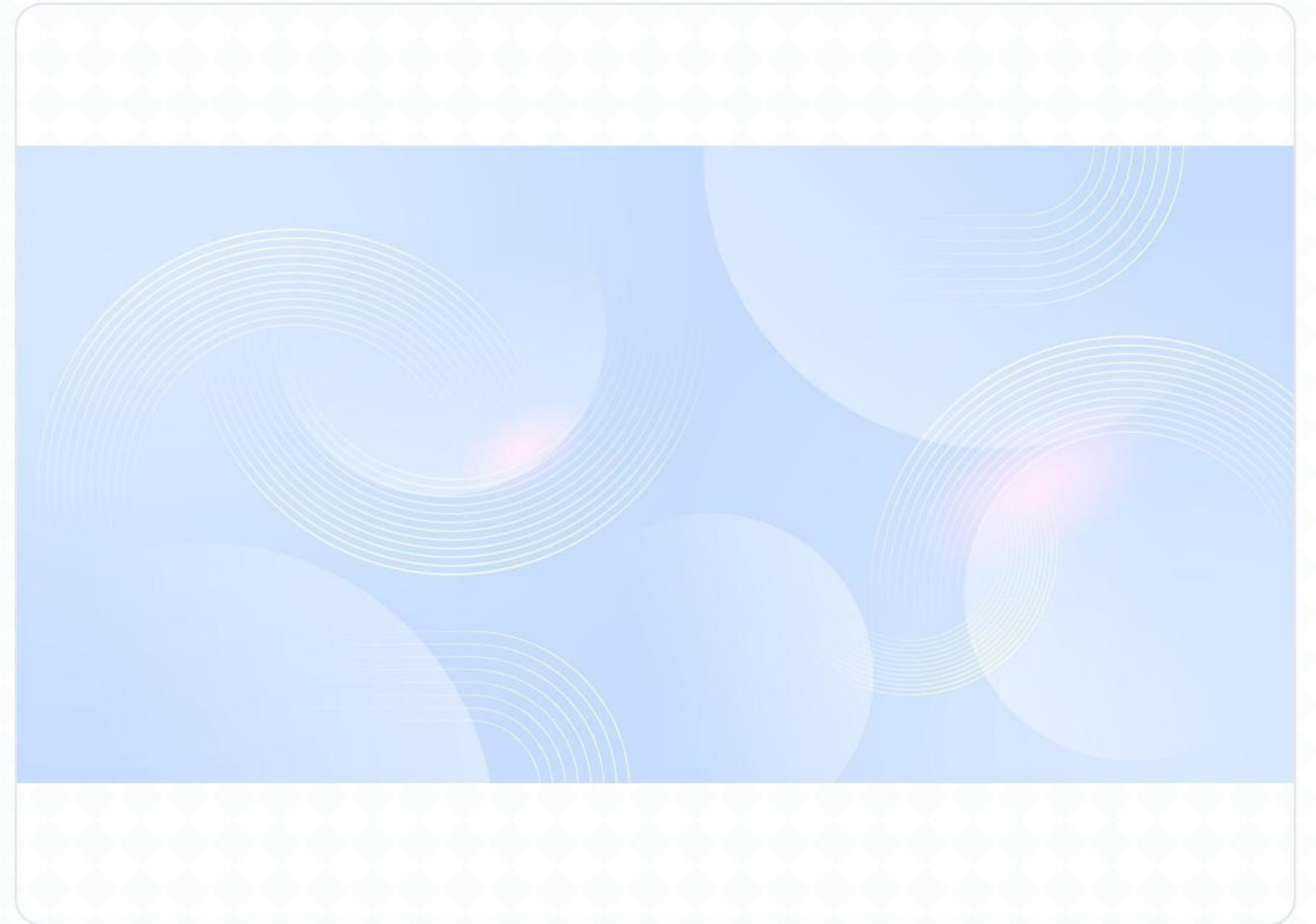
Key Aspects of Problem Definition

Business Context

Understand the industry, target customers, and critical pain points.

Stakeholder Goals

What does the business want? (e.g., improve retention, reduce latency, increase sales).

Root Cause vs. Symptom

Identify the real problem, not just the surface-level symptom.

Constraints

Time, budget, technical feasibility, and data availability.

2. Framing Hypotheses for Analytics

" If [independent variable] changes, then [dependent variable] will change because [rationale]. "

A hypothesis is an educated assumption that can be tested using data. It helps teams move from vague goals to measurable insights.

Hypothesis in Practice

10%
Decrease in Drop-off

Example Hypothesis

"**If** we reduce page load time by 30%, **then** the user drop-off rate during checkout will decrease by 10% **because** a faster experience reduces user-frustration."

This guides engineers to add performance monitoring, log user sessions, and analyze funnel metrics.

3. Defining Objectives & Metrics

Objectives (The "What")

These are the high-level goals. They state what you want to achieve.

Example:
"Improve user retention."

Success Metrics (The "How")

These are the quantifiable indicators (KPIs) that prove you've met the objective.

Example:
"Retention rate increases from 60% to 75% within 3 months."

Example: Engineering Success Metrics

Objective: Improve system reliability for payment processing.
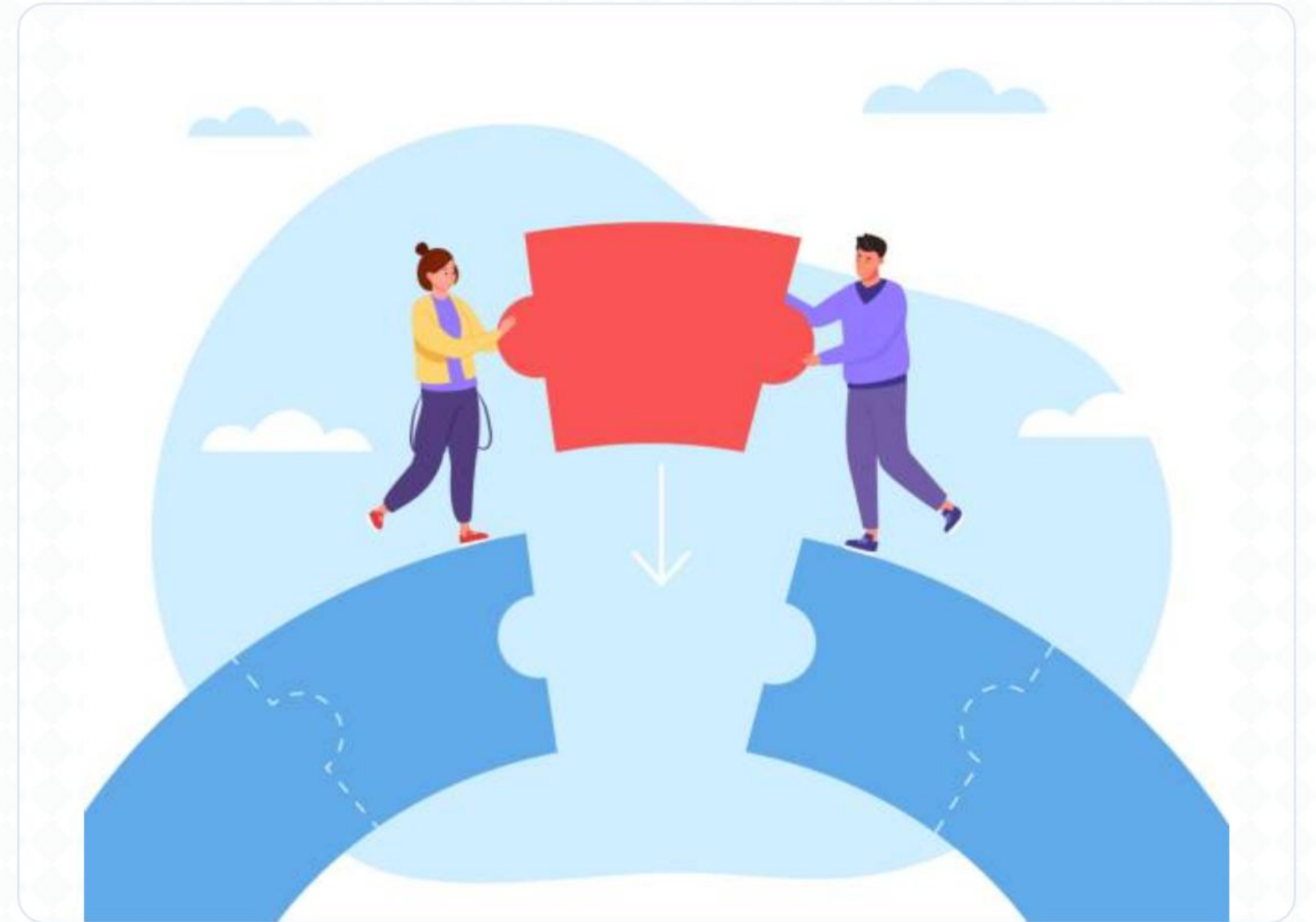
99.95% Uptime: Target for the Payment Service availability.

Error Rate < 0.1%: Target for failed transactions.

Average Latency < 500ms: Target for transaction response time.

Guided Decisions: These metrics directly guide design choices like load balancing, caching, and failover strategies.
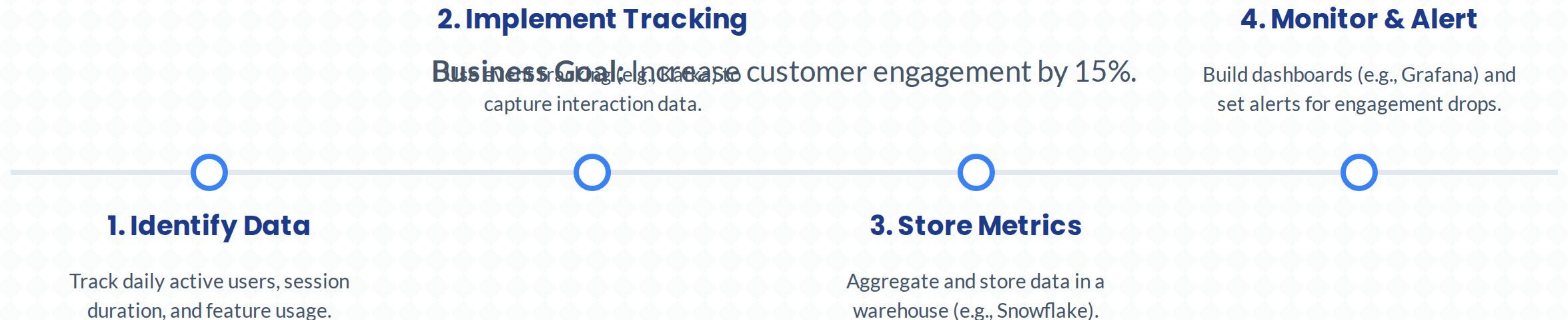
4. Mapping Data Needs to Goals

From Strategy to System

This is the process of translating business questions and goals into concrete data requirements and system-level solutions.

It connects **strategy** (business intent) with **implementation** (engineering).

From Business Goal to Engineering Action

Business Goal: Increase customer engagement by 15%.

2. Implement Tracking

Use event tracking (e.g., Kafka) to capture interaction data.

4. Monitor & Alert

Build dashboards (e.g., Grafana) and set alerts for engagement drops.

1. Identify Data

Track daily active users, session duration, and feature usage.

3. Store Metrics

Aggregate and store data in a warehouse (e.g., Snowflake).

Putting It All Together: End-to-End Flow

Step	Business Focus	Software Engineering Focus	Output
Understand Problem	Identify pain point or opportunity	Define the scope of system or feature	Problem Statement
Frame Hypothesis	Make assumptions testable with data	Design experiments, tracking, or logging	Experiment Plan
Define Objectives	Establish KPIs and expected outcomes	Translate into performance/reliability targets	Success Criteria
Map Data to Goals	Determine what data supports decisions	Build data pipelines, APIs, dashboards	Data-Driven Insights

Questions?

Thank you for your time.

Image Sources

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