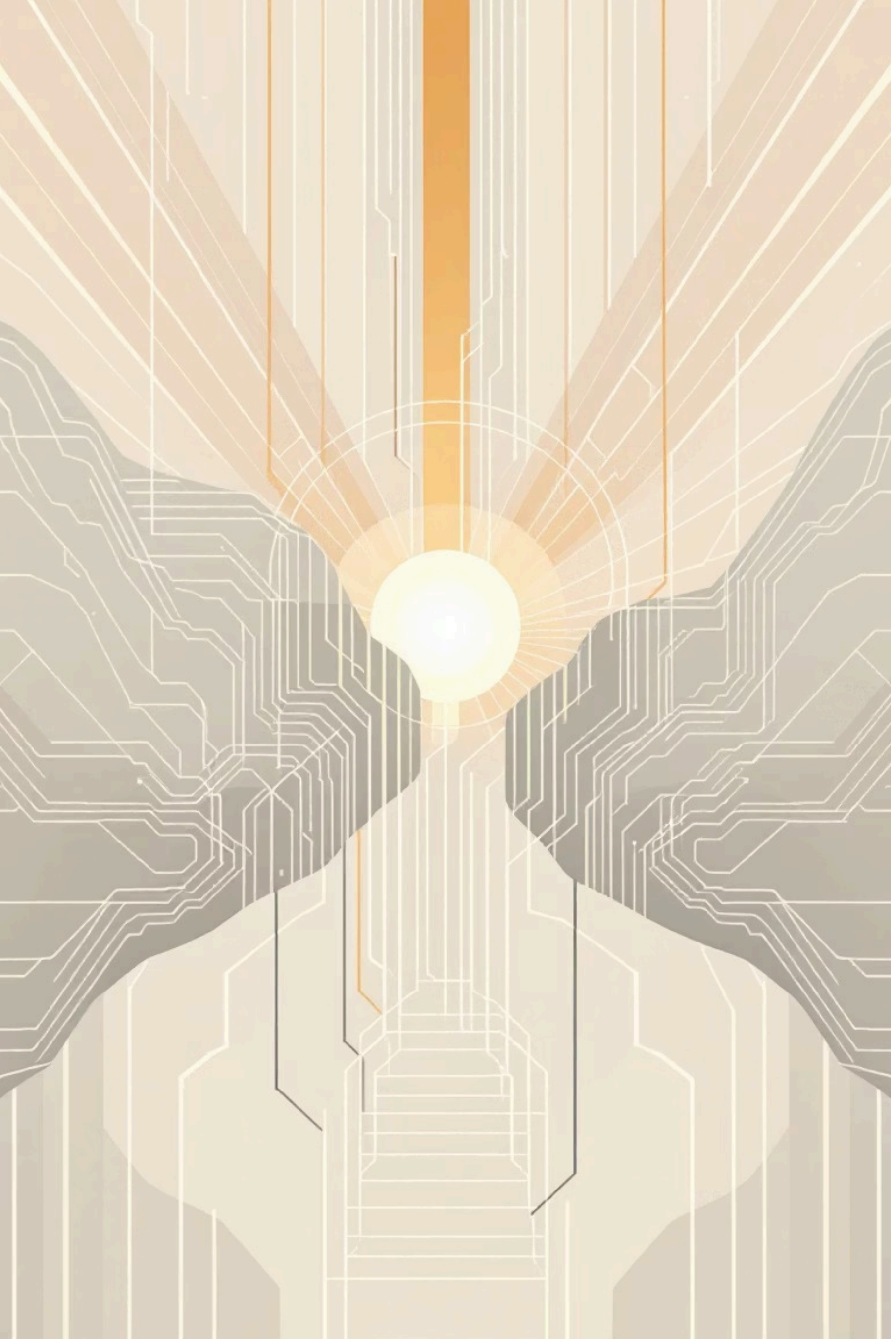

Strategic Data Analysis for Decision Making

Transforming Data into Insights and Insights into Action

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Institution: Institut Informatika dan Bisnis Darmajaya

Year: 2025

Presentation Roadmap

01

Introduction

From Gut Feeling to Data-Driven Decisions

02

Part 1

Data Analysis Techniques: Descriptive, Diagnostic, Predictive, Prescriptive

03

Part 2

The Art and Science of Interpreting Analysis Results

04

Part 3

Building a Data-Driven Decision-Making Culture

05

Part 4

Case Study: Real-World Application

06

Conclusion

Key Takeaways and Initial Steps

The Four Levels of Data Insights

Modern data analysis frameworks divide analytics into four progressive levels, each building deeper understanding for strategic decisions.

Descriptive Analytics: What Happened?

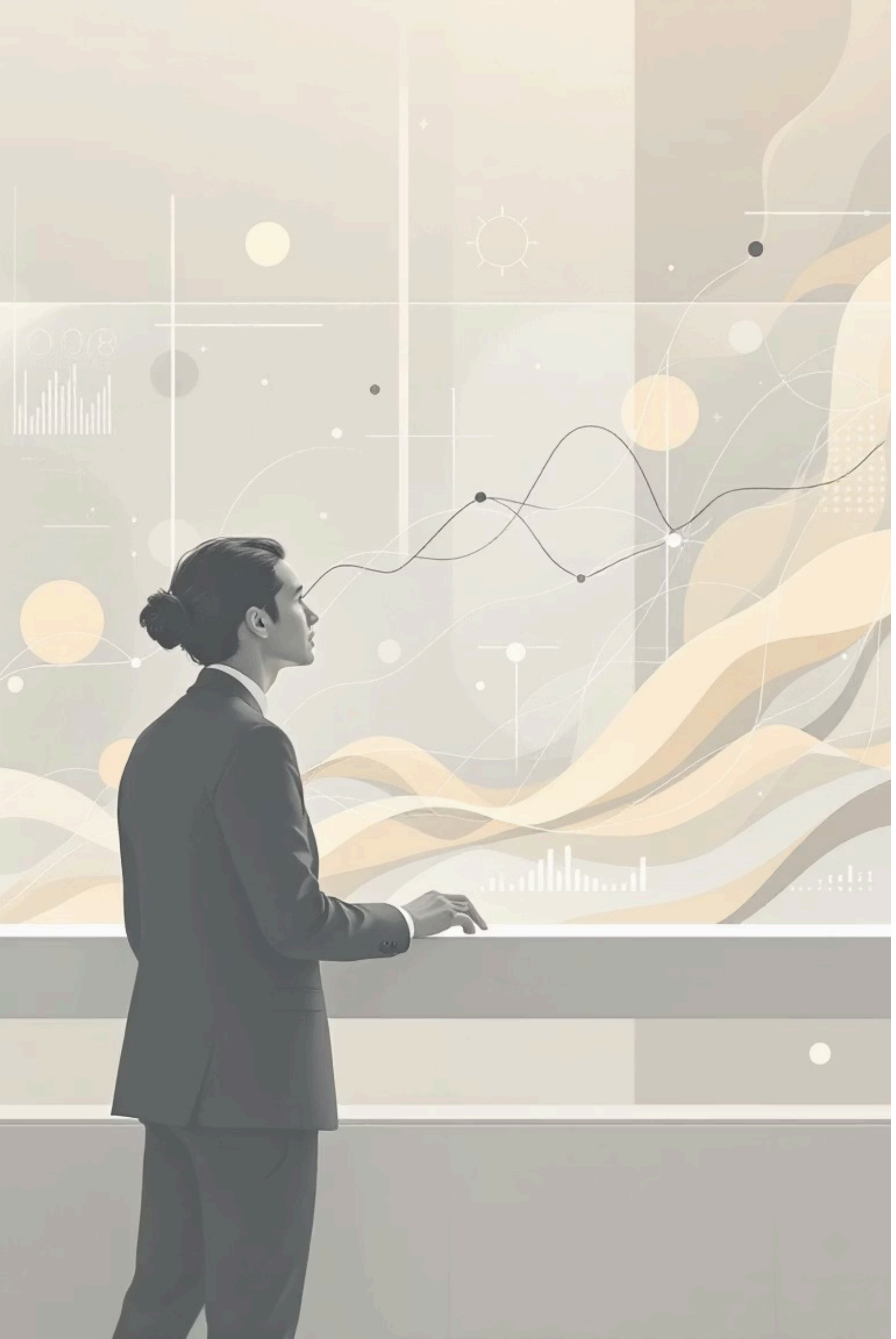
Focuses on historical data to understand past performance.

Techniques: Dashboards, summary reports (sums, averages, counts), visualizations like graphs and charts.

Example: "Q3 sales dropped 15% compared to Q2, revealing seasonal trends."

Key Benefits

Provides baseline metrics for tracking business health and identifying immediate issues.



Diagnostic and Predictive Analytics

Diagnostic: Why Did It Happen?

Investigates root causes behind events.

Techniques: Drill-down analysis, correlations, root cause investigations.

Example: "Sales decline correlates with reduced website traffic post-SEO algorithm update."

Predictive: What Will Happen?

Forecasts future outcomes using historical patterns.

Techniques: Regression models, machine learning, forecasting tools.

Example: "Seasonal data predicts 20% demand surge in December from marketing efforts."

Prescriptive Analytics: What Should We Do?

Recommends optimal actions based on predictions to maximize outcomes.

Techniques: Optimization algorithms, simulations, A/B testing.

Example: "Increase stock at Warehouse Y and launch promotions in Region Z to boost profits by 25%."

Actionable Recommendations

Guides resource allocation for competitive advantage.

Strategic Optimization

Simulates scenarios to test decision impacts before implementation.

Interpreting Results: Beyond the Numbers

Effective interpretation turns raw data into reliable business intelligence. Key principles ensure accuracy and relevance.

Context is Key

A 10% decline means little without benchmarks—compare to industry norms or competitors for true perspective.

Correlation vs. Causation

Ice cream sales correlate with drownings, but summer heat causes both. Beware spurious correlations in decision-making.

Statistical and Practical Significance

Findings may be statistically valid but lack business impact—prioritize what drives real value.

Right Visualization for the Story

Use line charts for trends, bars for comparisons, pies for proportions to communicate clearly and avoid misleading audiences.

Data-Driven Decision Making (DDDM)

Definition: A systematic process where decisions stem from data analysis rather than intuition alone, fostering objectivity in business leadership.

Why It Matters: Reduces biases like confirmation bias, enhances accuracy for accountable choices, and optimizes resources for maximum impact.

Identify Problem/Goal

Define clear business objectives.

Gather and Clean Data

Collect relevant, high-quality information.

Analyze and Interpret

Apply techniques to uncover insights.

Decide, Implement, Monitor

Act, evaluate, and iterate for continuous improvement.

Case Study: Boosting EduLearn App Engagement

Background: The "EduLearn" learning app faced declining course completion rates, prompting a data-driven turnaround.

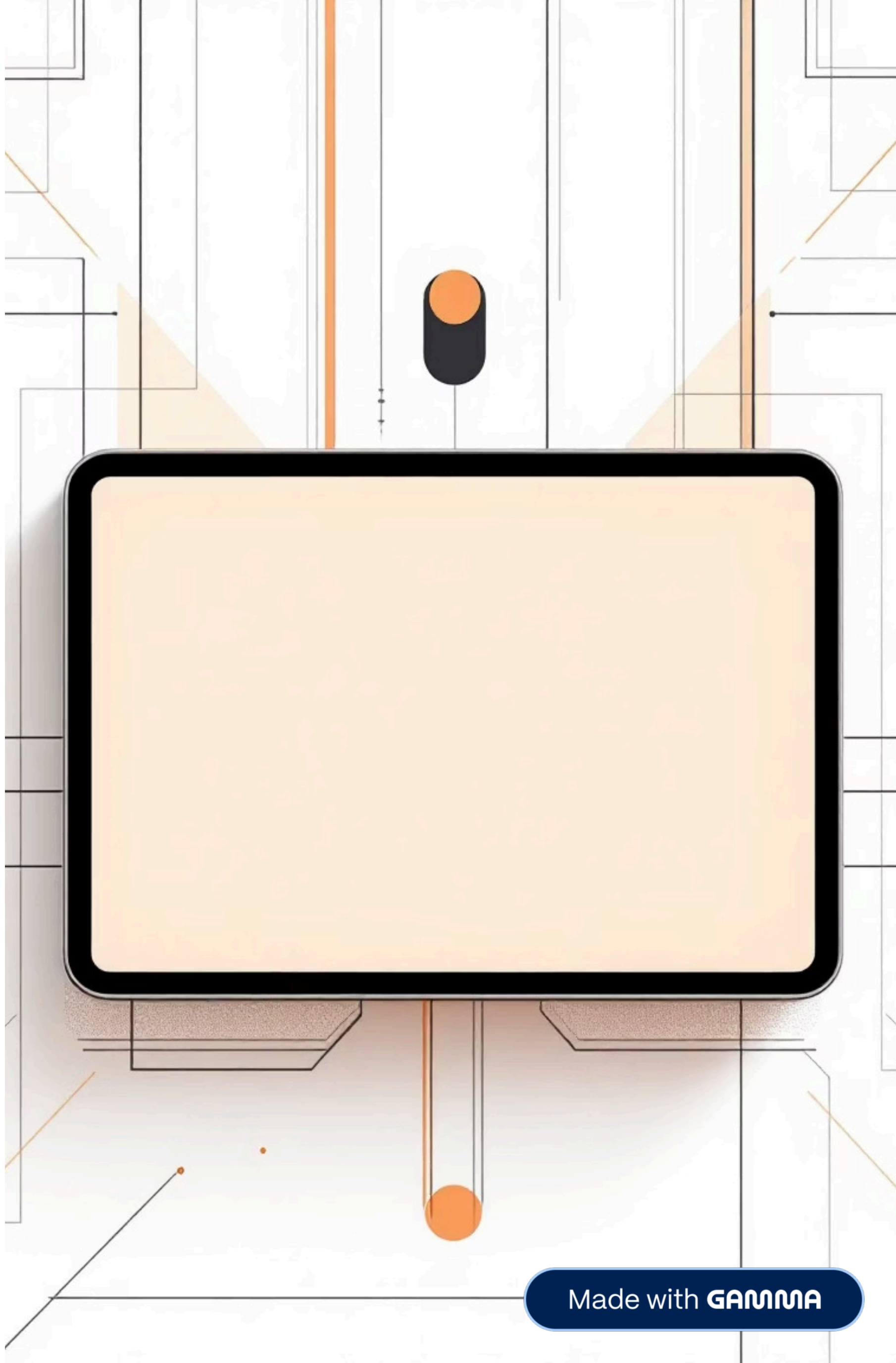
Descriptive & Diagnostic Steps

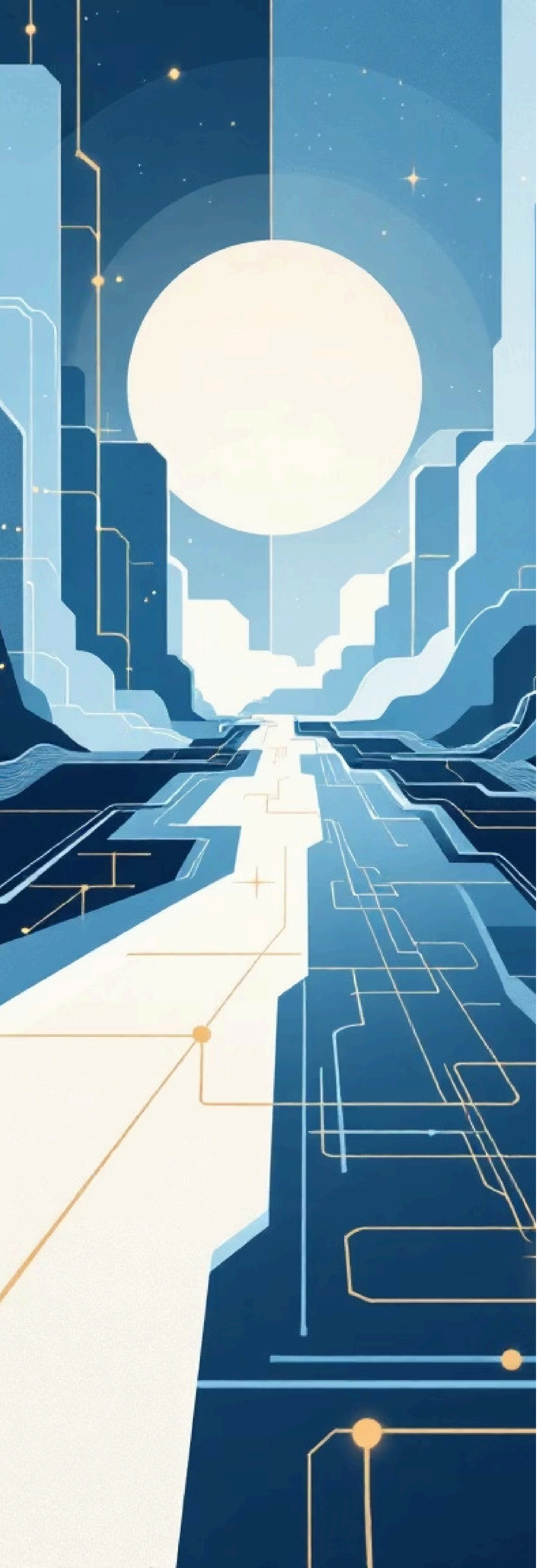
Dashboard revealed 60% dropout in "Basic Programming" Module 3. User behavior analysis linked it to a confusing OOP video, confirmed by surveys noting its fast pace and complexity.

Predictive & Prescriptive Actions

Forecasts warned of ongoing reputational damage. Recommendations: Split video into three simpler segments with interactive quizzes.

Implementation: A/B tested revisions; new version lifted Module 3 completion by 35% in one month, validating the approach.





Case Study Analysis: EduLearn App Engagement

The EduLearn case study exemplifies a systematic application of Data-Driven Decision Making (DDDM) through all analytical stages.

01

Descriptive: What Happened?

Dashboard tracking revealed a 60% dropout rate in "Basic Programming" Module 3, quantifying the problem.

02

Diagnostic: Why It Happened?

User behavior analysis and surveys linked dropouts to a confusing "OOP Concepts" video (too fast/complex).

03

Predictive: What Will Happen?

Forecasts indicated ongoing reputational damage and revenue decline if the issue remained unaddressed.

04

Prescriptive: What Should We Do?

Recommended splitting the video into three simpler segments with interactive quizzes to reduce cognitive load.

05

Implementation & Evaluation

A/B testing showed the new module boosted completion by 35% in one month, validating the data-driven solution.

06

Key Conclusions

This process highlights data-driven problem identification, root cause analysis, impact assessment, and validated solution design.

Conclusion: Integrate Data, Ethics, and Emotion

Data analysis empowers strategic decisions but must blend with leadership wisdom, ethical considerations, and emotional intelligence for humane, responsible outcomes.

Start with Business Questions

Frame inquiries first; let data answer them effectively.

Initial Steps for DDDM

1. Identify one data-solvable problem.
2. Use existing data sources.
3. Foster "why" questioning.
4. Run small A/B experiments.

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