

Four Types of Business Analytics

- Business analytics: turning data into fact-based decisions
- Four types: descriptive, diagnostic, predictive, prescriptive
- Journey from hindsight to insight to foresight and action
- Foundation for analysts, data learners, and business leaders



DESCRIPTIVE



DIAGNOSTIC



PREDICTIVE



PRESCRIPTIVE



Why Analytics Has Shifted from Reporting to Action



- **Evolution:** static BI reporting → AI-driven, real-time analytics



- **Drivers:** competition, data volume, real-time decisions, digital transformation



- **Reporting** summarizes the past; analytics predicts and prescribes actions



- **Maturity:** from static dashboards to decision intelligence



Core Framework: Four Questions That Drive Every Business Decision

- What happened? Why?
What will happen? What should we do?
- Each type answers one question and builds on the previous
- Running example: retail sales decline and customer churn
- Use in sequence:
descriptive → diagnostic → predictive → prescriptive



Descriptive Analytics: What Happened



- Summarizes historical data into digestible snapshots



- Common outputs: KPI dashboards, summary reports, trend visualizations



- Strengths: clarity, speed, foundation for all other analytics



- Limitations: backward-looking, no causal insight, dashboard sprawl risk



Diagnostic Analytics: Why Did It Happen



- Moves from observation to explanation: uncovers root causes



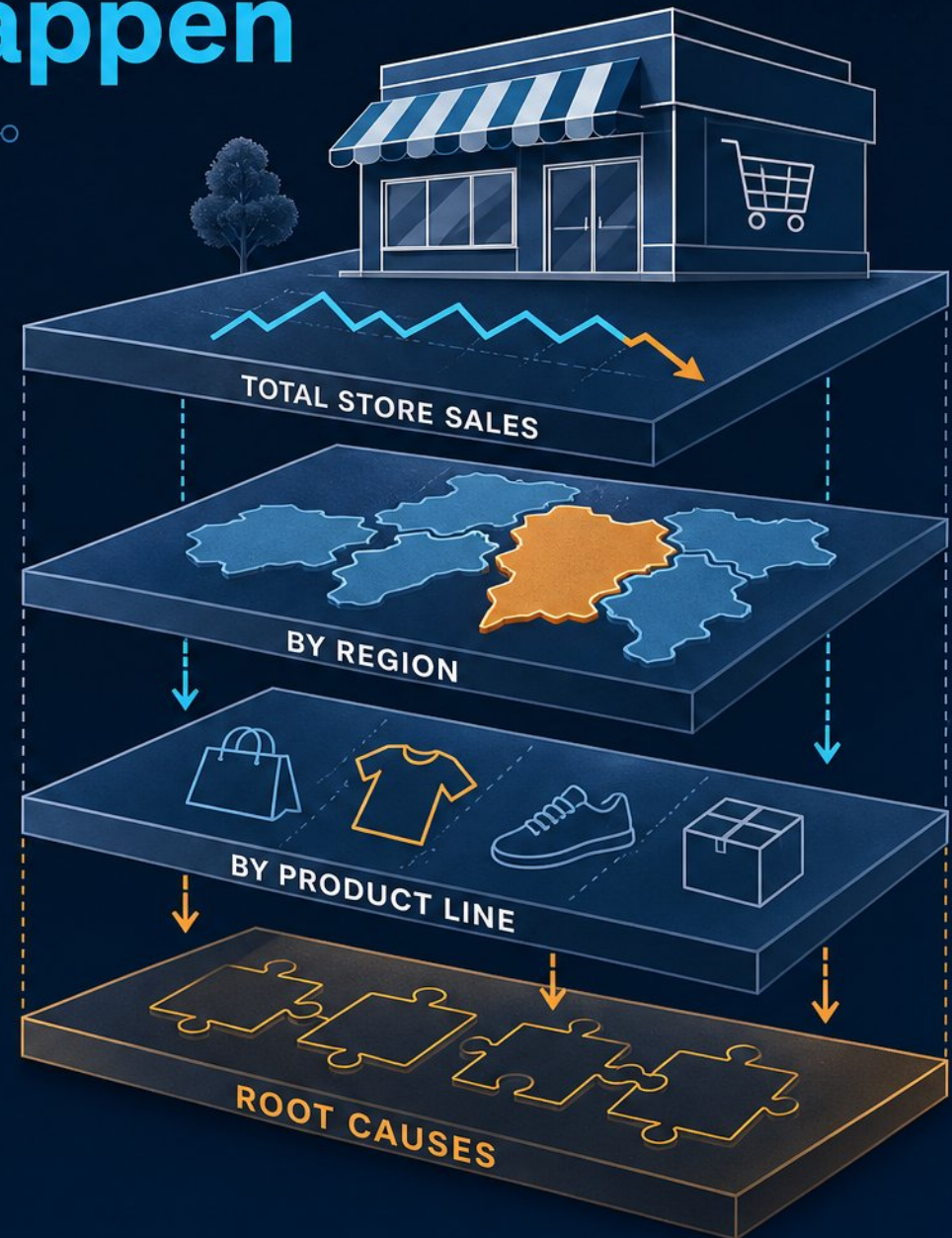
- Core techniques: drill-down, segmentation, correlation, anomaly detection



- Example: investigating why sales declined in a specific region



- Turns symptoms into actionable drivers





Predictive Analytics: What Is Likely to Happen



- Forecasts the future based on historical patterns and data



- Common techniques: regression, classification, time series, machine learning



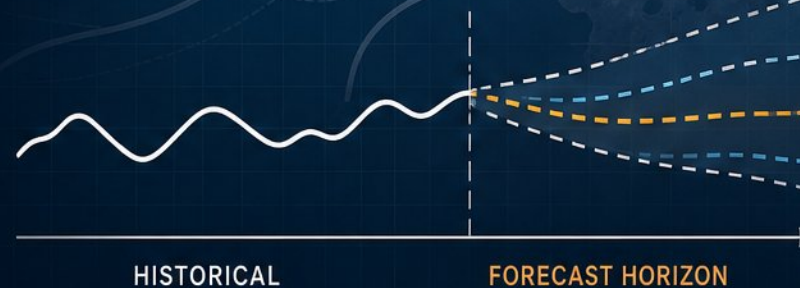
- Requires clean historical data, labeled outcomes, and model governance



- Business uses: demand forecasting, churn prediction, lead scoring



- Forecasts are probabilities, not certainties



Prescriptive Analytics: What Should We Do



- **Recommends optimal actions:**
“What should we do?”



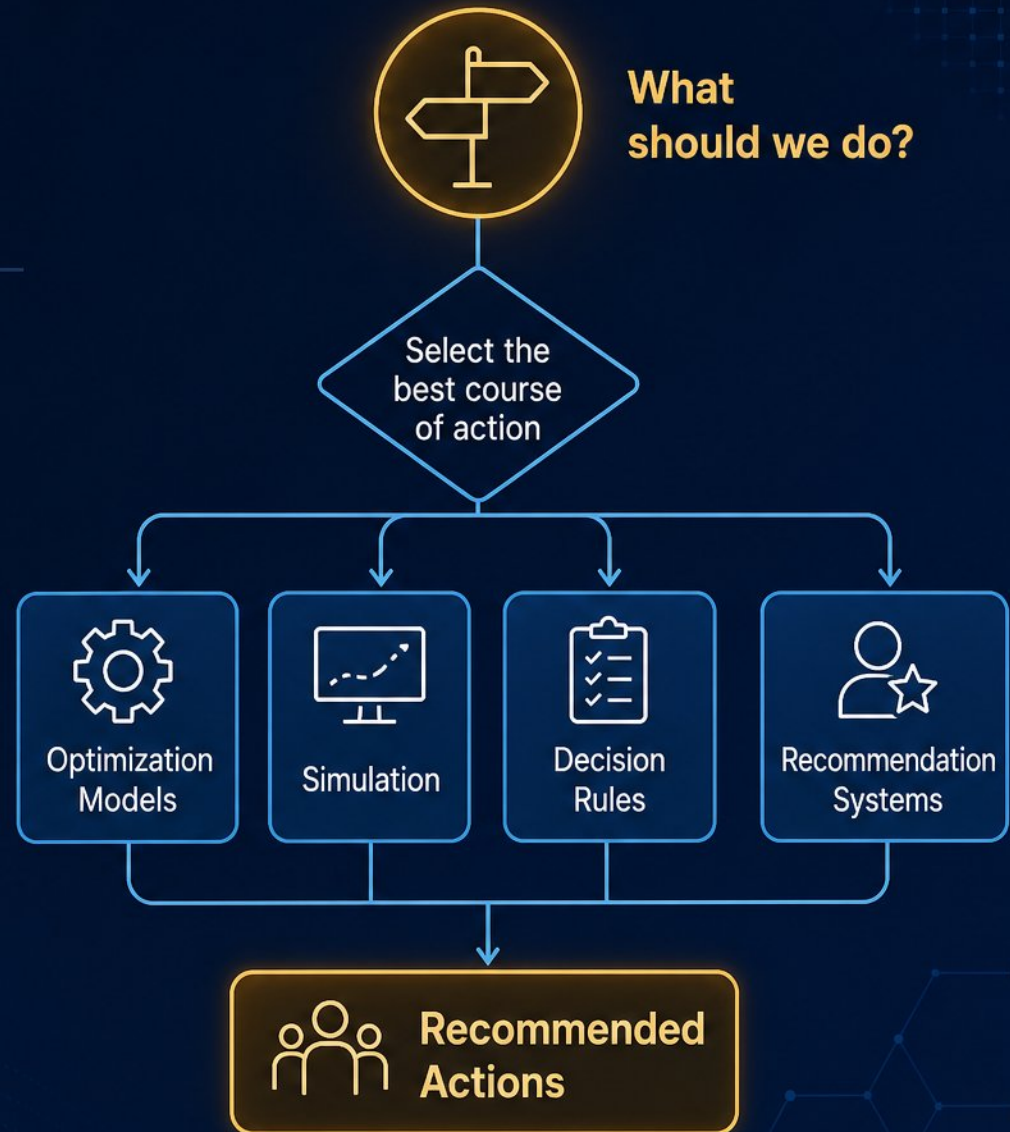
- **Core approaches:** optimization models, simulation, decision rules, recommendation systems



- **Goes beyond predicting:**
forecasting informs, prescriptive recommends

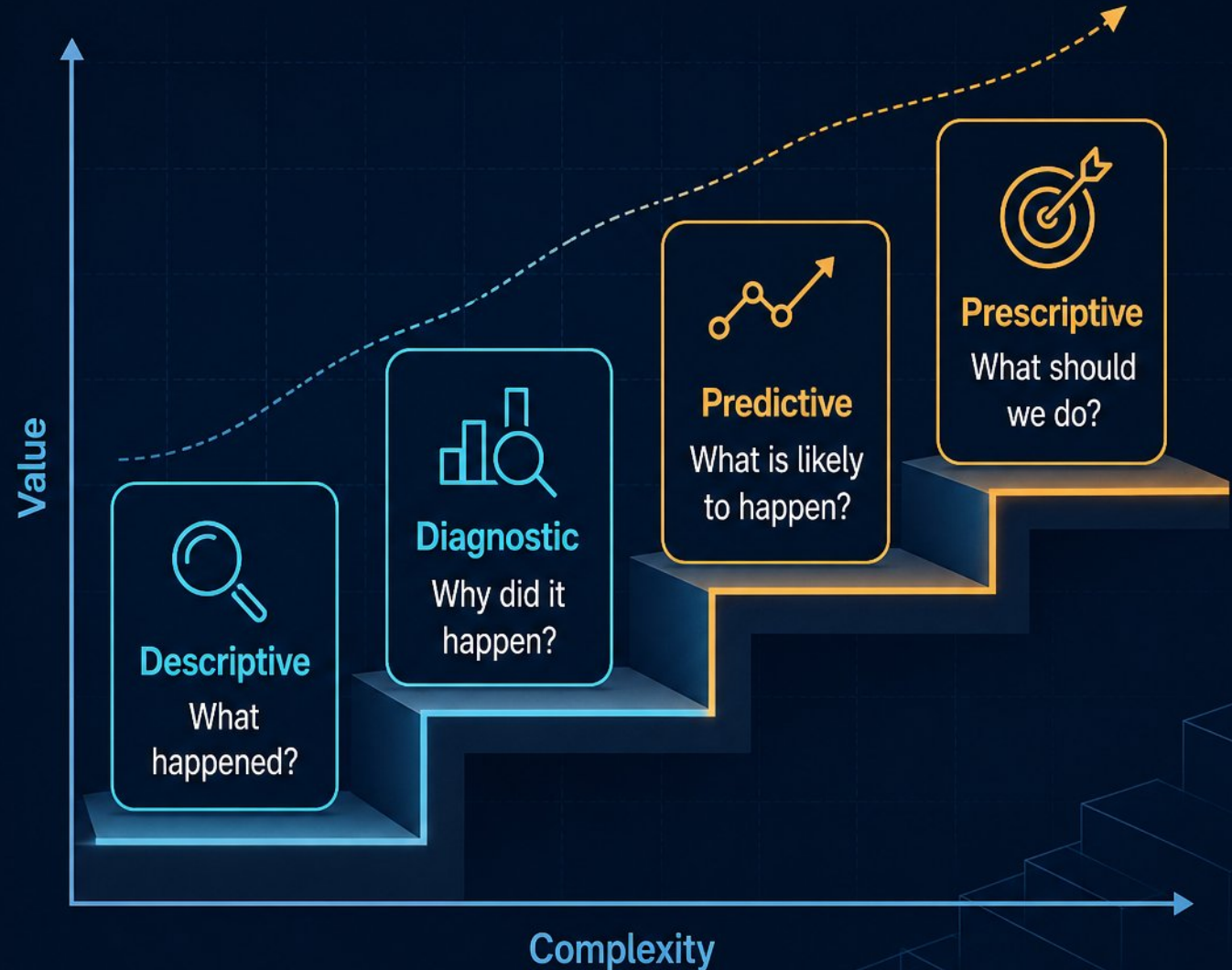


- **Adoption challenges:**
data quality, model complexity, explainability, and human trust



Comparing the Four Types: Value vs. Complexity

- Each type answers a distinct business question; higher maturity does not automatically mean higher value
- Complexity, data needs, and skills increase from descriptive to prescriptive
- Most organizations build value at descriptive and diagnostic stages first
- Choose the type that matches your question and organizational readiness
- Avoid skipping foundations: advanced models on untrusted data will fail



From Maturity Model to Real-World Application



- Analytics maturity: from basic reporting to AI-driven decision-making



- Maturity stages build sequentially: descriptive → diagnostic → predictive → prescriptive



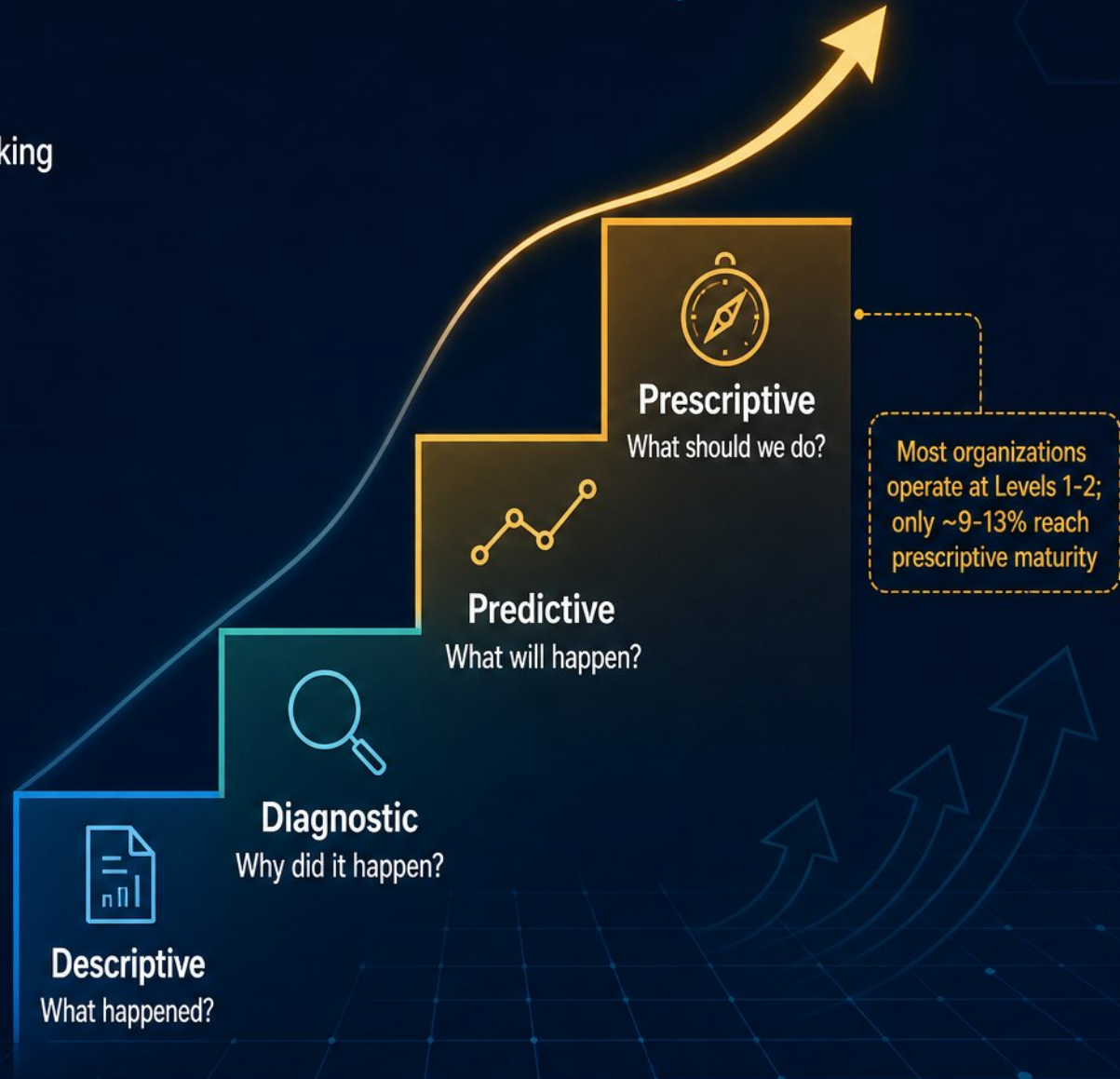
- Most organizations operate at Levels 1-2; only ~9-13% reach prescriptive maturity



- Highest business value often comes from mastering descriptive and diagnostic first



- Readiness checklist: data quality, governance, cross-functional collaboration, executive sponsorship



Practical Adoption Roadmap for Your Organization



- Start with an honest assessment: data quality, tools, skills, trust



- Prioritize high-value, low-complexity use cases first



- Build a cross-functional team: business owners co-own outcomes



- Define success metrics: adoption rates and business outcomes



Building Data Foundations Before Advanced Models



- Governance, lineage, and one source of truth must precede advanced models



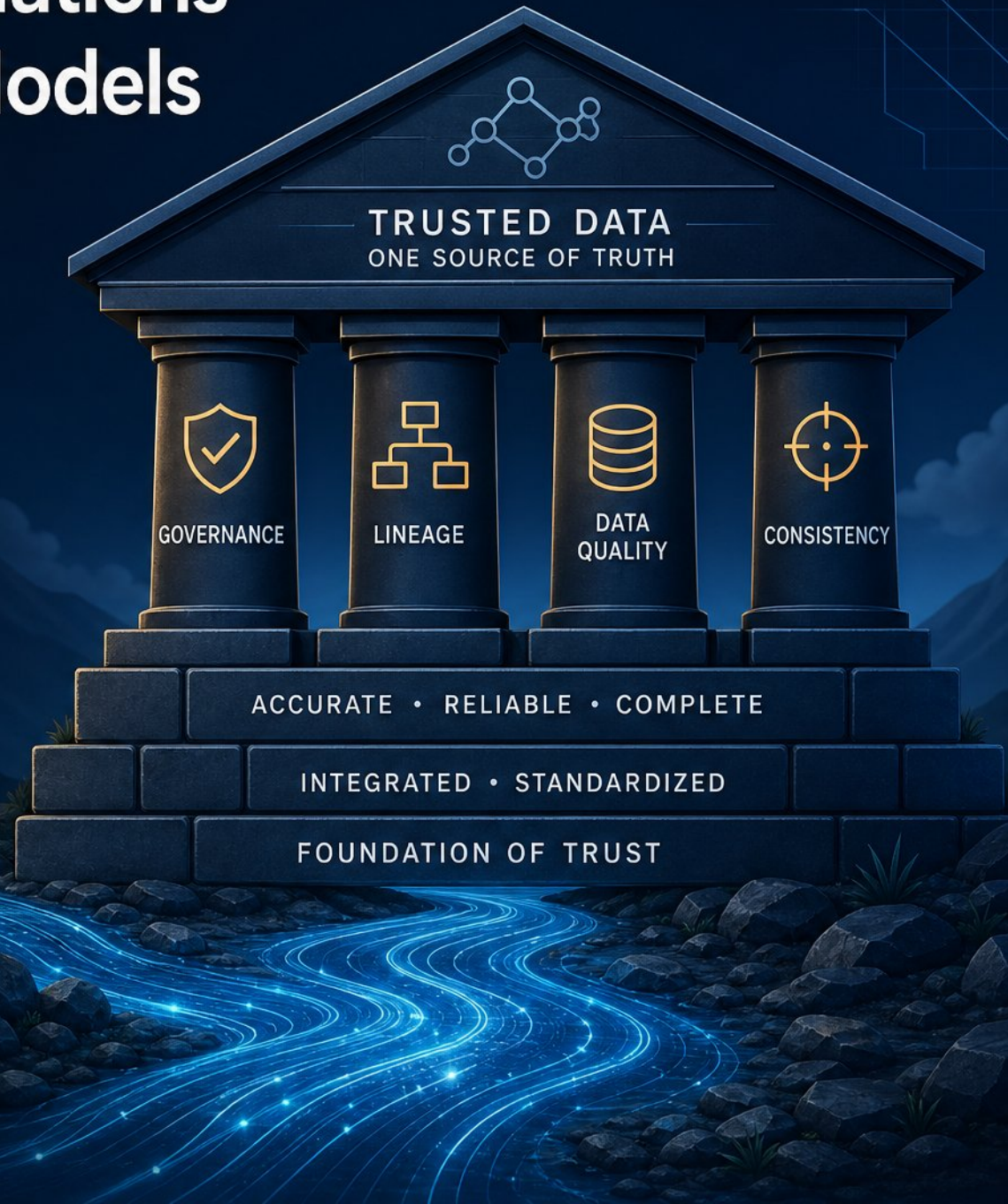
- Common failures: models on untrusted data, IT-only projects, tool-first approaches



- Iterate in short cycles: build, get feedback, refine, then expand



- The three-people test: different teams, same metric, same number?



Case Study Spotlight: Predictive Analytics in Demand Forecasting



FORECAST
ACCURACY
61% → 94%



STOCKOUT
LOSSES
ELIMINATED:
\$4M annually



EXTERNAL
SIGNALS



AUTOMATED
REPLENISHMENT



Stockout losses eliminated:
**\$4M annually (61% → 94%
forecast accuracy)**



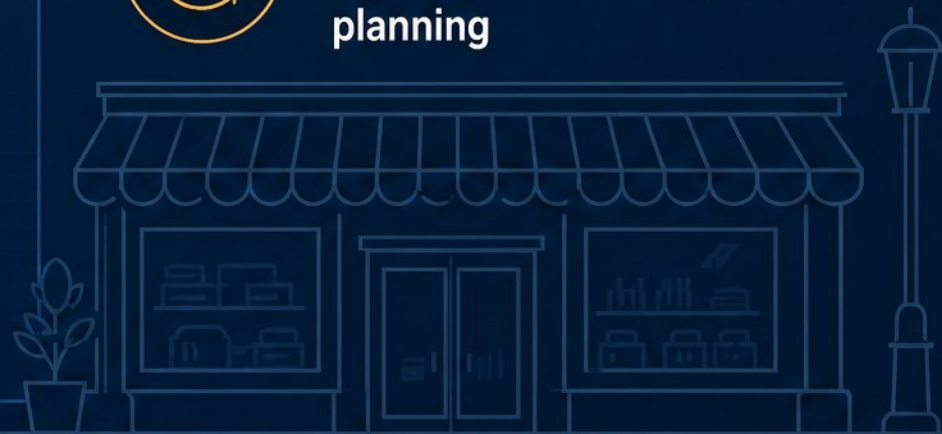
Churn reduced by 22% with
personalized interventions



External signals boost
accuracy; explainability
builds trust



Forecasts trigger automated
replenishment and optimized
planning



Key Takeaways and the Four Questions to Remember



- Four questions: what happened, why, what will happen, what should we do?



- Types build on each other: descriptive → diagnostic → predictive → prescriptive



- Self-assess: your organization's current analytics stage?



- Next step: pick one metric, define it clearly, run a small pilot

Next Steps and Quick Wins



- Clean one core metric;
build one trusted dashboard



- Run one root-cause
analysis for quick wins



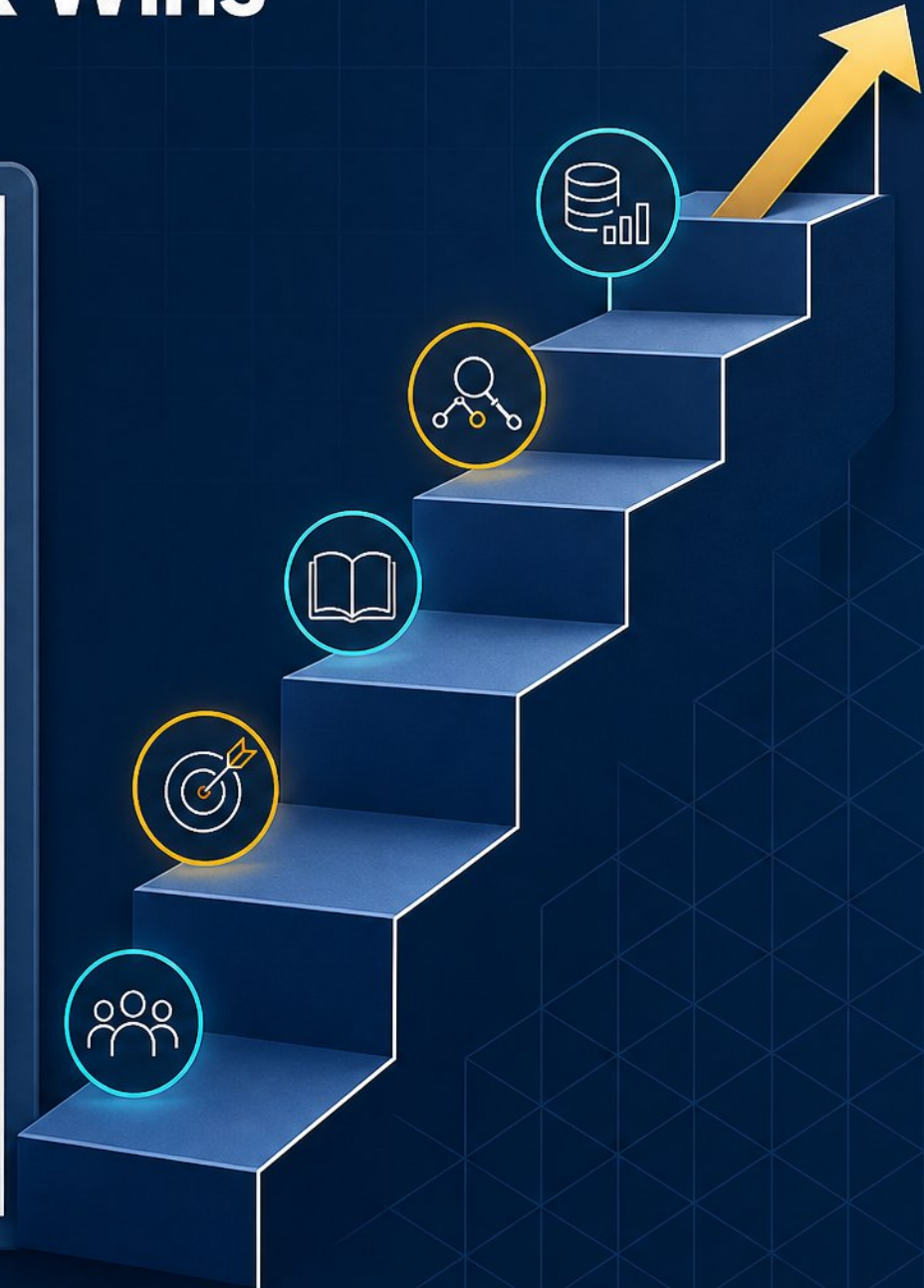
- Learn SQL, statistics,
ML basics, optimization



- 90-day pilot: pick a decision,
start small, measure



- Secure executive sponsorship
and cross-functional collaboration



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