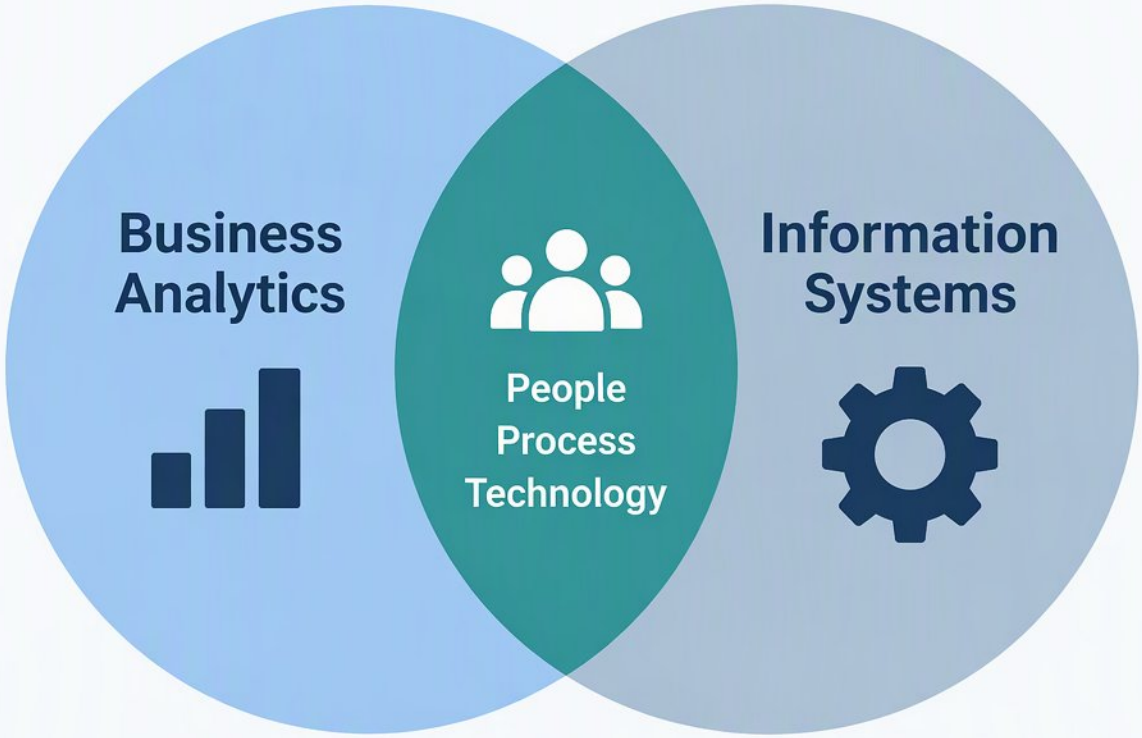
Business Analytics and Information Systems:
Concepts, Purpose, and Examples

- **Objective:** build a shared vocabulary and decision framework linking analytics to information systems.
- **One delivery chain:** business analysts, IS owners, and data/product teams, from question to system to decision.
- **Roadmap:** concepts, value, architecture, use cases, roles and governance, risks and ethics, 90-day plan.
- **Working definitions:** analytics converts data into decisions; information systems capture, store, move, and control that data.



Why Analytics and Information Systems Belong Together

- Analytics applies statistics, predictive modeling, and visualization to improve decisions
- Information systems provide the technology, people, and processes that collect and distribute data
- Analysts extract insight; IS professionals build the infrastructure for trusted data
- Analytics builds on decision support systems and operations research, now extended to self-service BI
- Socio-technical view: people, structure, and incentives plus hardware, software, data, procedures
- Handoffs between analysts, IS owners, and product teams decide whether insight becomes action





The Case for Investment:
Purpose and Business Value

Decision quality:
mature data strategies mean faster, more confident decisions

Operational value:
integrated systems cut reconciliation effort, latency, and error rates

Strategic value:
data as an asset fuels new products, pricing, and risk management

Current signal:
analytics use cases deliver top AI ROI, up to about 42% impact

43% now run AI-powered analytics in production, but value needs quality, adoption, ownership



Core Concepts: Analytics Types, Data Platforms, and IS Building Blocks

Key ideas that connect data, technology, and people

Analytics Types

- Four analytics types: descriptive, diagnostic, predictive, prescriptive



Data Platforms

- Warehouse: structured, schema-on-write, BI-optimized
- Lake: raw data, schema-on-read, flexible, ML-oriented
- Lakehouse: ACID transactions and governance on open storage



Integration Patterns

- Integration: ETL vs. ELT, batch vs. streaming, CDC, APIs



IS Building Blocks and Vocabulary

- IS building blocks: hardware, software, data, procedures, people, networks
- Key vocabulary: KPIs, master data, lineage, semantic layer, system of record



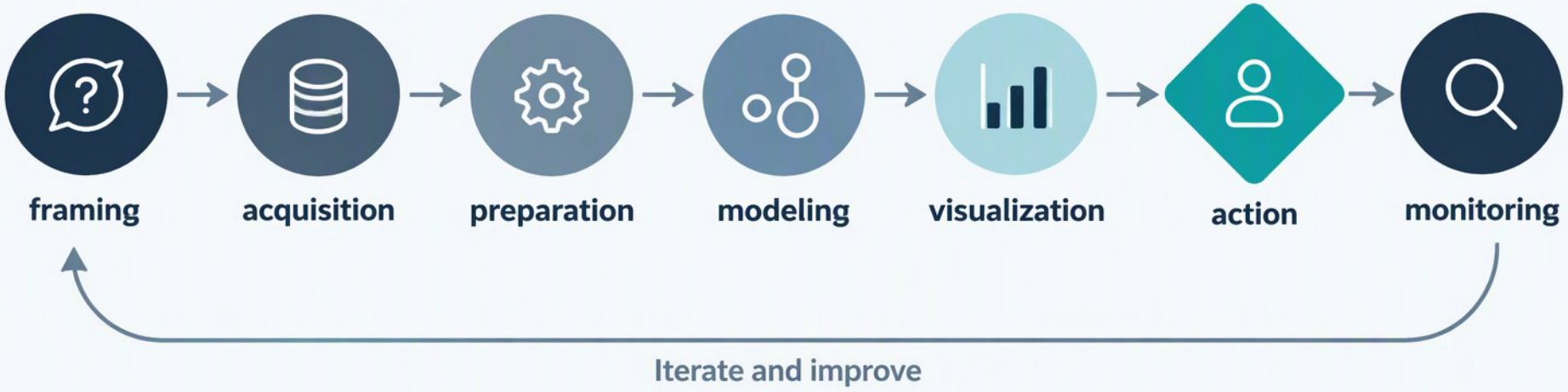
From Sources to Insights

A layered view of a modern data and analytics architecture



From Data to Decisions: The Analytics Workflow

QUESTIONS
INSIGHTS
ACTIONS
BETTER OUTCOMES



Lifecycle: framing → acquisition → preparation → modeling → visualization → action → monitoring

Translate each business question into a metric, data requirement, and refresh cadence

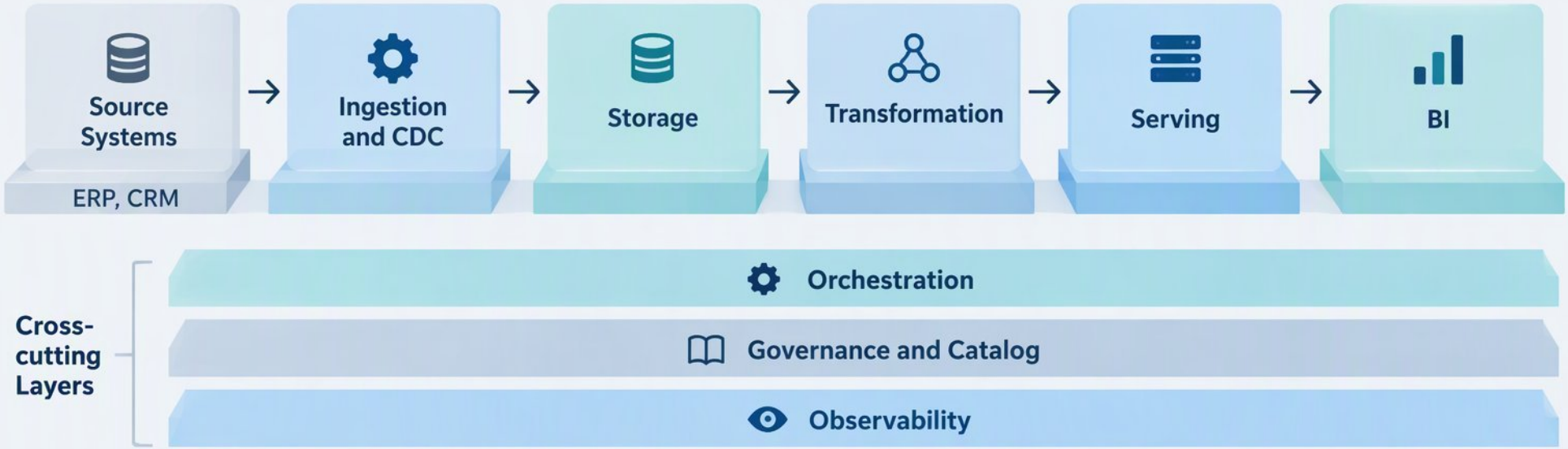
Iterate: analysis reshapes the question; document changes to speed the next cycle

Common failures: ambiguous questions, poor data quality, no action owner

Design principle: start with the decision and decision-maker, then work backward to data

Information Systems Architecture and Data Flow

FROM SOURCES TO INSIGHTS, ENABLED BY A STRONG INFORMATION SYSTEMS FOUNDATION



Functional layers: source systems → ingestion and CDC → storage → transformation → serving → BI

Integration patterns: batch versus streaming, APIs, event-driven, zero-copy federation

Analytics depends on IS for availability, latency, trusted definitions, clean system-of-record boundaries

Cross-cutting layers decide success: orchestration, governance and catalog, observability

Modern components: cloud platforms, open table formats (Iceberg, Delta, Hudi), semantic layers

Sequencing: query and federation first, then catalog and governance, then storage, transformation, orchestration

Use Cases Across Business Functions

FROM DATA
TO BETTER DECISIONS

Marketing and sales

segmentation, churn prediction, campaign attribution, pipeline coverage

- Business question
- Data and systems
- Method
- Expected decision

Operations and supply chain

demand forecasting, inventory optimization, OTIF tracking, downtime root cause

- Business question
- Data and systems
- Method
- Expected decision

Finance and risk

fraud detection, credit scoring, rolling forecasts, variance analysis, regulatory reporting

- Business question
- Data and systems
- Method
- Expected decision

Product and customer

usage analytics, experimentation, service dashboards, NPS, churn, CLV

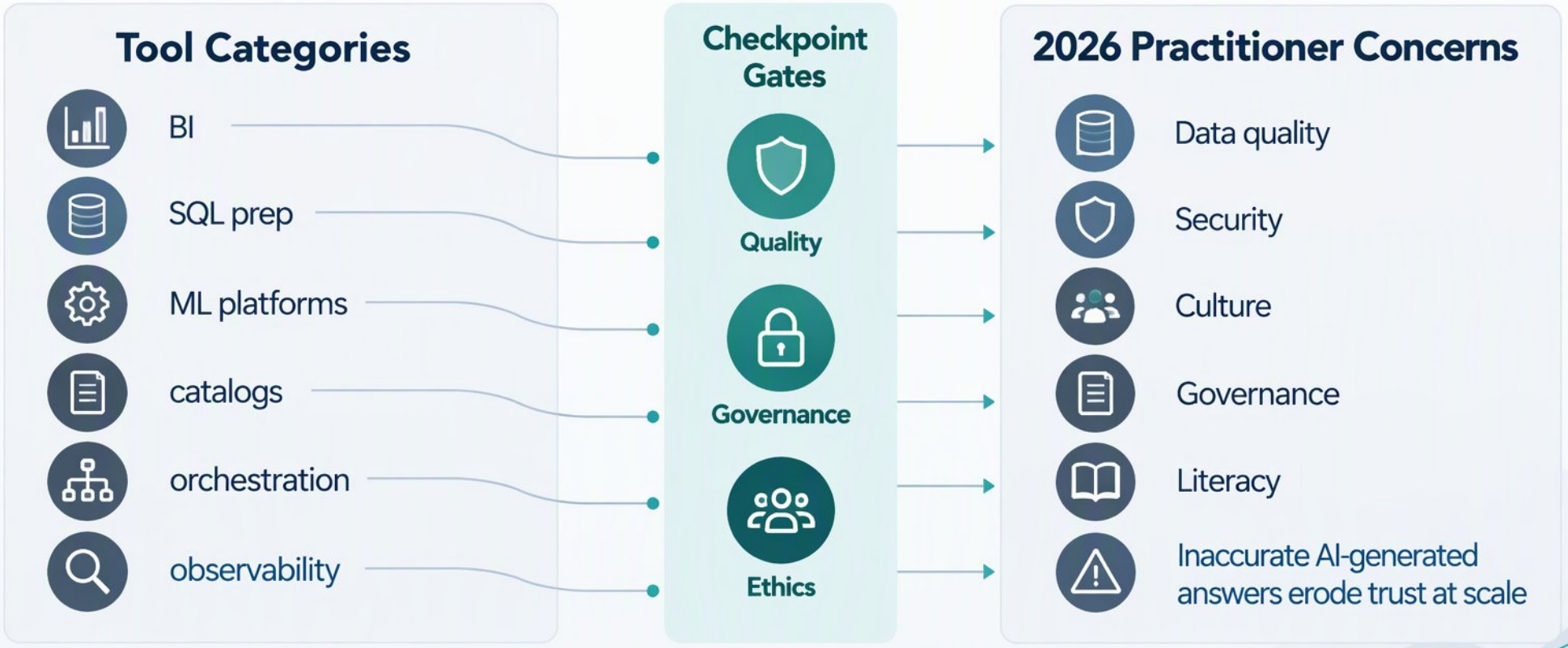
- Business question
- Data and systems
- Method
- Expected decision

Prioritize: a small share of use cases drives most value

Tools, Data Quality, and the Current Analytics Landscape

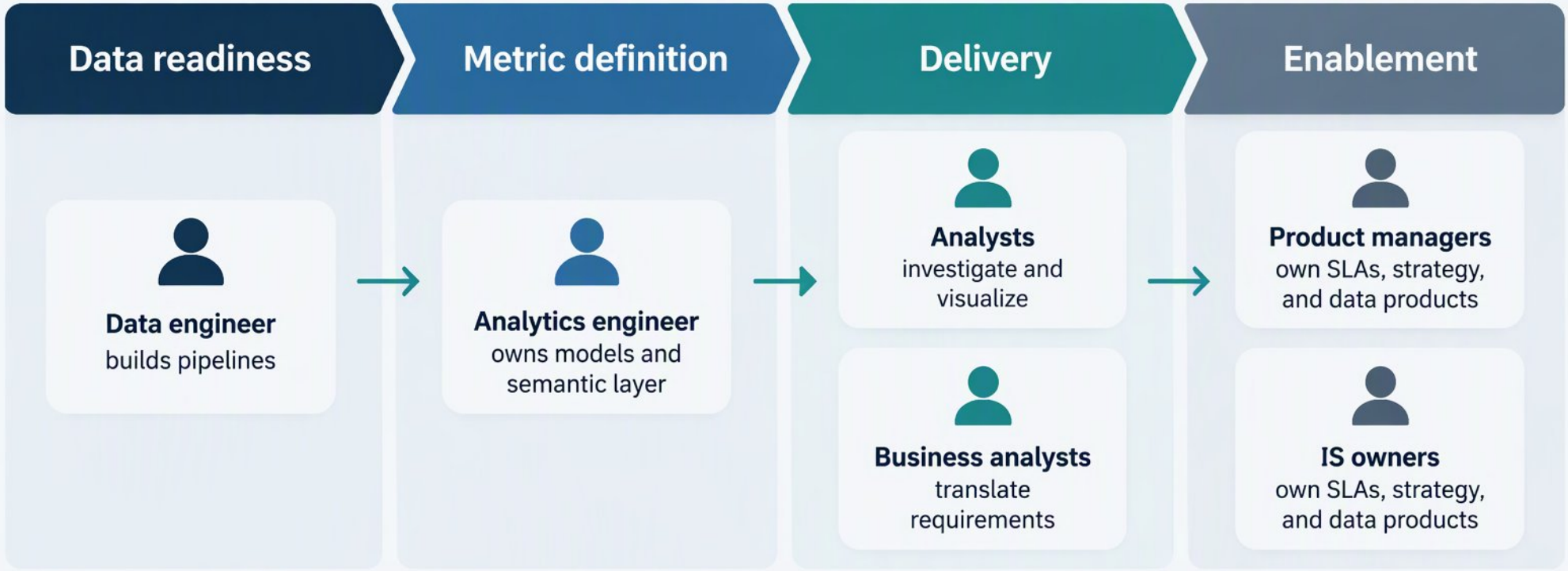
PEOPLE
DATA
BETTER DECISIONS

- Tool categories: BI, SQL prep, ML platforms, catalogs, orchestration, observability
- 2026 stack is leaner: three or four tools tied to clear use cases
- Data quality back on top in 2026, then security and governance
- Foundational trends still matter: quality, culture, governance, literacy
- Top concern: inaccurate AI-generated answers erode trust at scale



Roles, Responsibilities, and Ways of Working

PEOPLE
DATA
IMPACT



Key takeaways

- Four work areas: data readiness, metric definition, delivery, enablement
- Data engineer builds pipelines; analytics engineer owns models and semantic layer
- Analysts investigate and visualize; business analysts translate requirements
- Product managers and IS owners own SLAs, strategy, and data products
- Unclear roles leak prep work into one-off SQL and duplicate metrics
- Build versus buy: weigh use case, reversibility, and long-term operators

CLEAR ROLES
BETTER DATA
BRIGHTER OUTCOMES

Governance, Security, and Data Quality

PEOPLE
POLICY
DATA
TRUST

Data governance: ownership, stewardship, glossary, classification, policy, retention

Security and privacy: access control, PII masking, GDPR-style rules, EU AI Act documentation

Data quality: completeness, accuracy, consistency, timeliness, validity — monitored continuously

Trust controls: lineage, audit trails, automated validation checks, evidence bundles

Readiness gap: only 43% have formal governance frameworks; 88% say AI demands new approaches





GOVERN
PROTECT
IMPROVE
ENABLE

A STRONGER, TRUSTED TOMORROW

Risks, Pitfalls, and Ethical Considerations

HIGHER STANDARDS BRIGHTER OUTCOMES

- Biased data and models scale disparities once AI enters decisions
- Fallacies: correlation/causation confusion, survivorship bias, misleading visuals, forecasts without feedback
- Over-automation risk: predictions shipped without monitoring, escalation paths, or human oversight
- Governance gap: principles are shared, but lifecycle controls remain scarce in 2026
- Embedded transparency: interpretable by design, documented uncertainty, stakeholder-relative explanations
- Accountability: a named owner for each model-driven decision, able to explain and contest it



Common Failure Patterns and How to Avoid Them

FROM CHALLENGES TO BETTER OUTCOMES

Data foundation failure:
incomplete or poor-quality data blocks data-driven maturity; 26% of organizational data is untrustworthy



Translation failure:
63% of D&A leaders say turning business questions into queries is error-prone; use a semantic layer with guardrails



Ownership failure:
analysis without an action owner stalls—assign a decision owner and review cadence upfront



Over-building failure:
assembling an enterprise stack for small workloads; right-size to team size and use case



Adoption failure:
only 8% of employees use advanced analytics today; 24% plan to triple that in 12 months



Applying This in Your Organization: A 90-Day Action Plan

Days 1–30

Assess:
inventory use cases, data assets, systems, and gaps; classify maturity

Prioritize:
two or three high-value use cases, each with a decision owner

Days 31–60

Stabitize:
standard metrics in a semantic layer, documented flows and lineage

Sequence platform work:
query and federation, then catalog and governance

Days 61–90

Assign by role:
analysts define metrics; IS owners document system boundaries

Track success:
time-to-insight, reconciliation incidents, adoption, decision velocity



Key Takeaways and Discussion

FROM INSIGHT TO ACTION

Analytics converts data into decisions; IS makes it available, consistent, controlled

Start from the decision, then design metric, data, and system

Analytics use cases deliver top AI ROI; quality, security, and governance still gate success

Governance and ethics are design requirements: lineage, transparency, oversight, accountability

Discussion: Which use case next quarter? Who owns the metric? Which system boundary blocks you?



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