Business School
UNIVERSITY OF COLORADO DENVER

Information Systems Program

Business Intelligence Concepts, Tools, and Applications

Week 2: Business Intelligence Concepts and Platform Capabilities

Lesson 1: BI Concepts

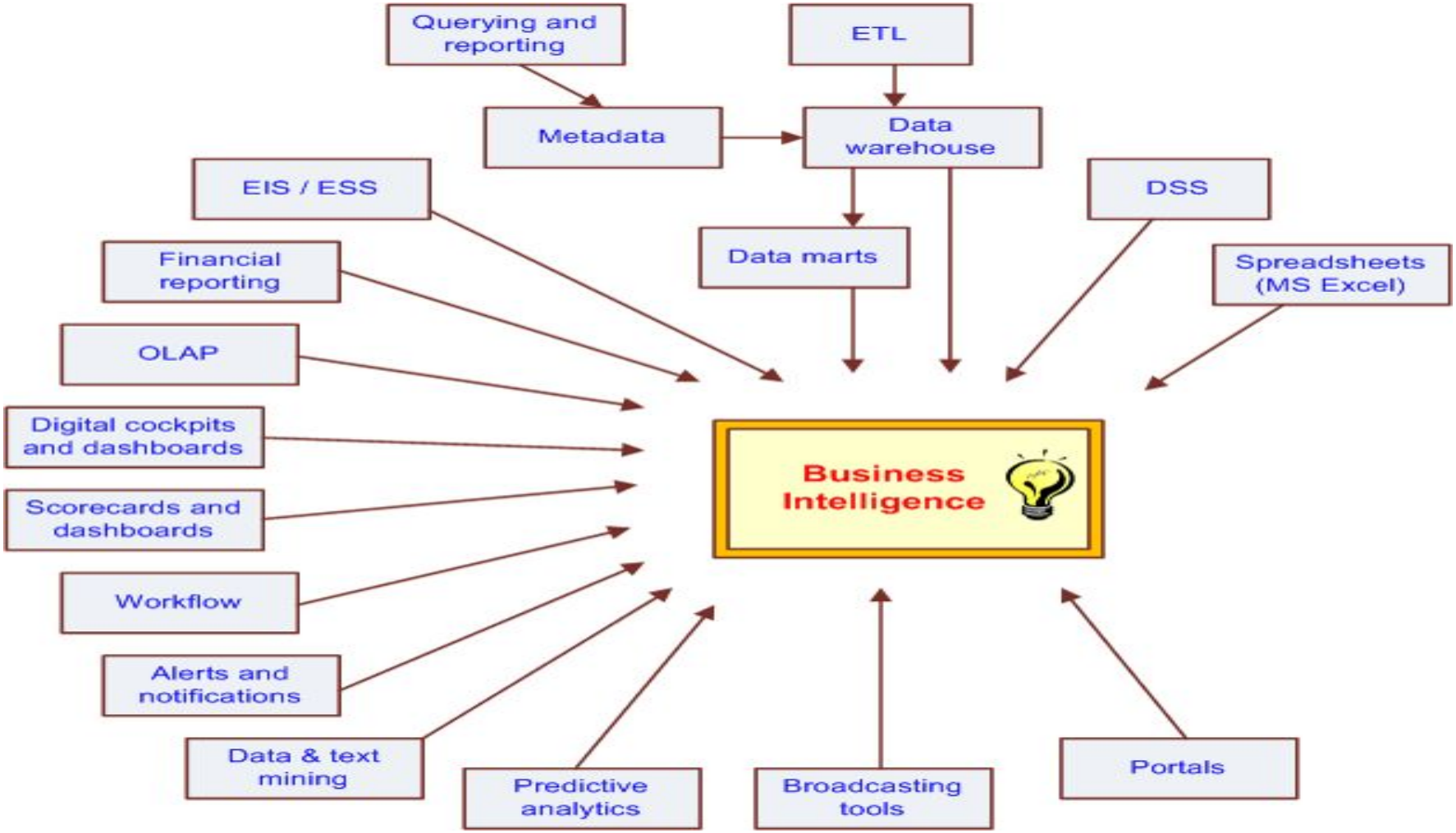
BI Concepts

- Learning Objectives
  - Define Business Intelligence
  - Learn Evolution of Business Intelligence Capabilities
  - Define BI architecture and its components
  - Summarize main applications and business value for BI

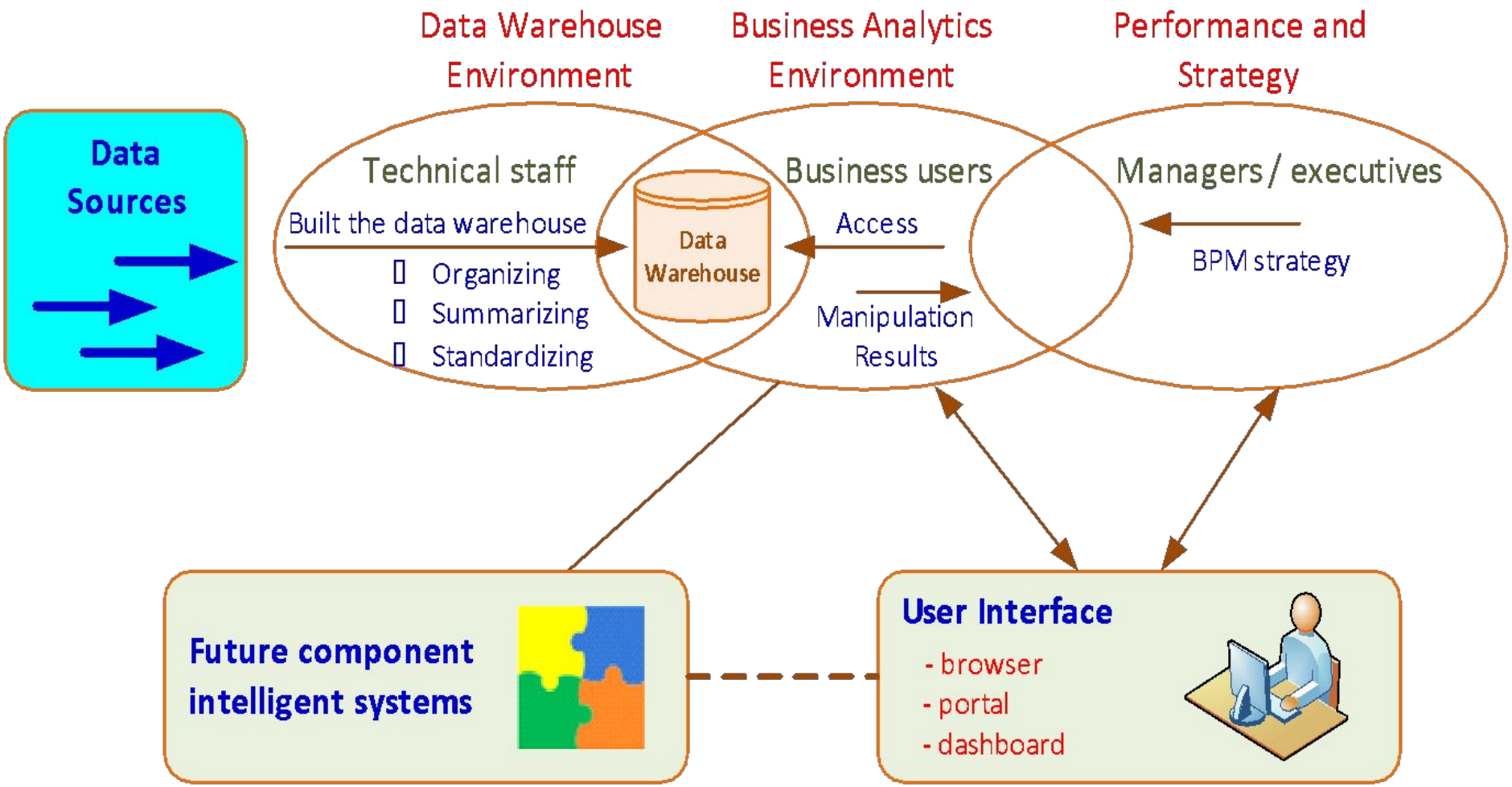
What is Business Intelligence

- *Business Intelligence* (BI) is an umbrella term that combines architectures, databases, analytical tools, applications, and methodologies.
- The Data Warehousing Institute (TDWI 2002) working definition of business intelligence:
  - "The processes, technologies, and tools needed to turn data into information, information into knowledge, and knowledge into plans that drive profitable business action. Business intelligence encompasses data warehousing, business analytic tools and content/knowledge management"

Evolution of BI Capabilities

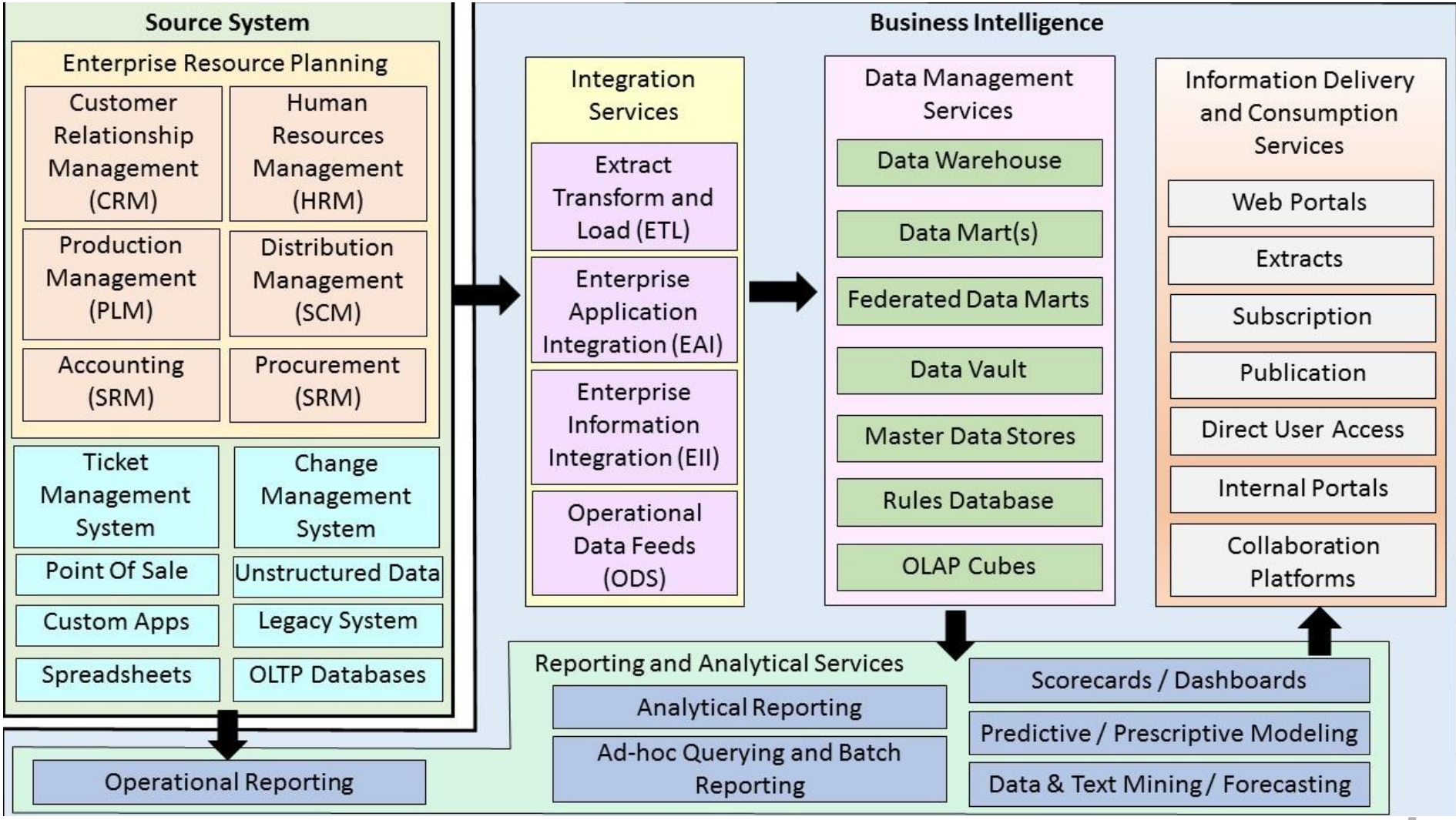


A High-Level BI Architecture



Source: Eckerson, W. Smart Companies in the 21st Century: The Secrets of Creating Successful Business Intelligent Solutions. The Data Warehousing Institute, Seattle, WA, 2003, p. 32

Detailed level BI Architecture



Based on: Pant, P. Business intelligence (BI): How to build successful BI Strategy, Deloitte Consulting LLP. 200**9.**

Source Systems

- **Many possible sources** – (ERP, Ticket and Change management system, point of sale, legacy system, unstructured data, etc.)
- **Many platforms** – IBM, Oracle, Microsoft, Sybase, SAS
- **Many formats** – Relational, Hierarchical, Columnar, Multi-dimensional, Big data MapReduce Databases, Unstructured text data

BI Services components

- ***Integration Services*** (ETL, Operational Data Feeds, Enterprise Application Integration, Enterprise Information Integration)
- ***Data Management Services*** (data warehouse, data marts, federated data marts, OLAP cubes, etc.)
- ***Reporting and Analytical Services*** (Analytical Reporting, ad-hoc query and batch reporting, dashboards/scorecards, predictive and prescriptive modeling, data & text mining/forecasting)
- ***Information Delivery and Consumption Services*** (Web portals, subscription, direct user access, internal portals

Types of BI users

- IT developers
- Analysts
- Information workers
- Managers and executives
- Front line workers
- Suppliers, customers, and regulators

Source Watson, H. J., "Tutorial: Business Intelligence –Past, Present, and Future," Communications of the Association for Information Systems: Vol. 25, Article 39, 2009.

BI Applications

- Business intelligence (BI) used for decision making can be broken into three main types of applications:
  - Strategic
  - Tactical
  - Operational

See White, C. Critical Agility: Operational BI Generates Faster and Smarter Decisions., TeraData Magazine Volume 9, No. 1, March 2009.

Strategic BI Applications

- Such applications help executives as well as business and financial analysts assess progress in achieving long-term, enterprise-wide goals such as increased revenue or market share, reduced costs, better customer retention and improved profitability.
  - For example, Strategic dashboards can reflect enterprise-wide strategic goals, as well as corresponding KPIs.
  - Features on this type of dashboard include global, external, trends and growth measures, all of which are related to or based on the Balanced Scorecard Methodology

Source White, C. Critical Agility: Operational BI Generates Faster and Smarter Decisions., TeraData Magazine Volume 9, No. 1, March 2009.

Tactical BI Applications

- These focus on analyzing short-term initiatives within specific line-of-business domains, such as marketing, sales, purchasing or customer service. Helping sales managers optimize their region-wide campaigns is an example of this type of BI application. For example:
  - Tactical (also called analytical) dashboards measure the business's progress according to related trends, in accordance with each strategic initiative. Progress is measured against a preset goal, such as a budget or a certain target.
  - Drilldowns reveal details and break down data for analysis. For example, they help determine why certain targets were not met and where a potential problem might be.

Source White, C. Critical Agility: Operational BI Generates Faster and Smarter Decisions., TeraData Magazine Volume 9, No. 1, March 2009.

Operational BI Applications

- This type features process-centric solutions for monitoring and optimizing specific business processes, such as call center operations, loan processing and inventory management.
- Operational applications are designed to help organizations manage their intra-day and daily business operations. For example:
  - Operational dashboards monitor specific business processes, such as order processing and shipping.
  - They are mainly used at the departmental level, where operations take place.
  - Updates are tracked daily or weekly using real time charts and reports, and detailed data is presented with strong analytical functionality in order to perform a root-cause analysis.

Source White, C. Critical Agility: Operational BI Generates Faster and Smarter Decisions., TeraData Magazine Volume 9, No. 1, March 2009.

BI Business Value

- According to Williams (2004), BI can add value to:
  - Management Processes:
    - Planning budgeting, performance monitoring/assessment, process improvement, cost analysis, optimization, etc.
  - Revenue Generating Processes:
    - Customer segmentation, campaign management, channel management, sales management, etc.
  - Resource Consumption Processes:
    - Product/service development, order management, manufacturing/operations, supply chain, purchasing, etc.

Adopted From Williams (2004) Assessing BI Readiness: A key to BI ROI. Business Intelligence Journal, Vol. 9, pp. 15-23, summer 2004