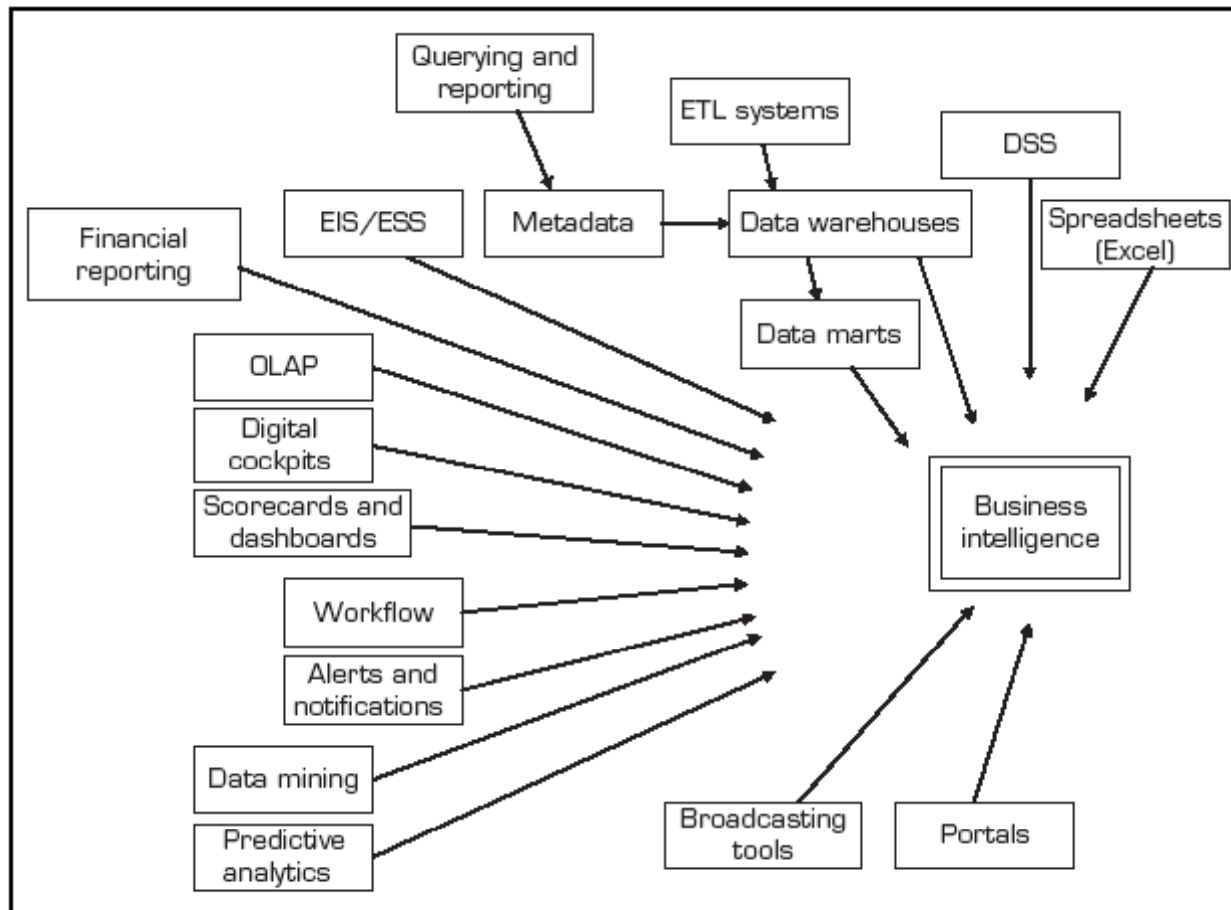# Lection 2

BUSINESS INTELLIGENCE

A Framework for Business Intelligence (BI)

- **Business intelligence (BI)**

  An umbrella term that combines architectures, tools, databases, applications, and methodologies

A Framework for Business Intelligence (BI)

FIGURE 1.6   Evolution of BI

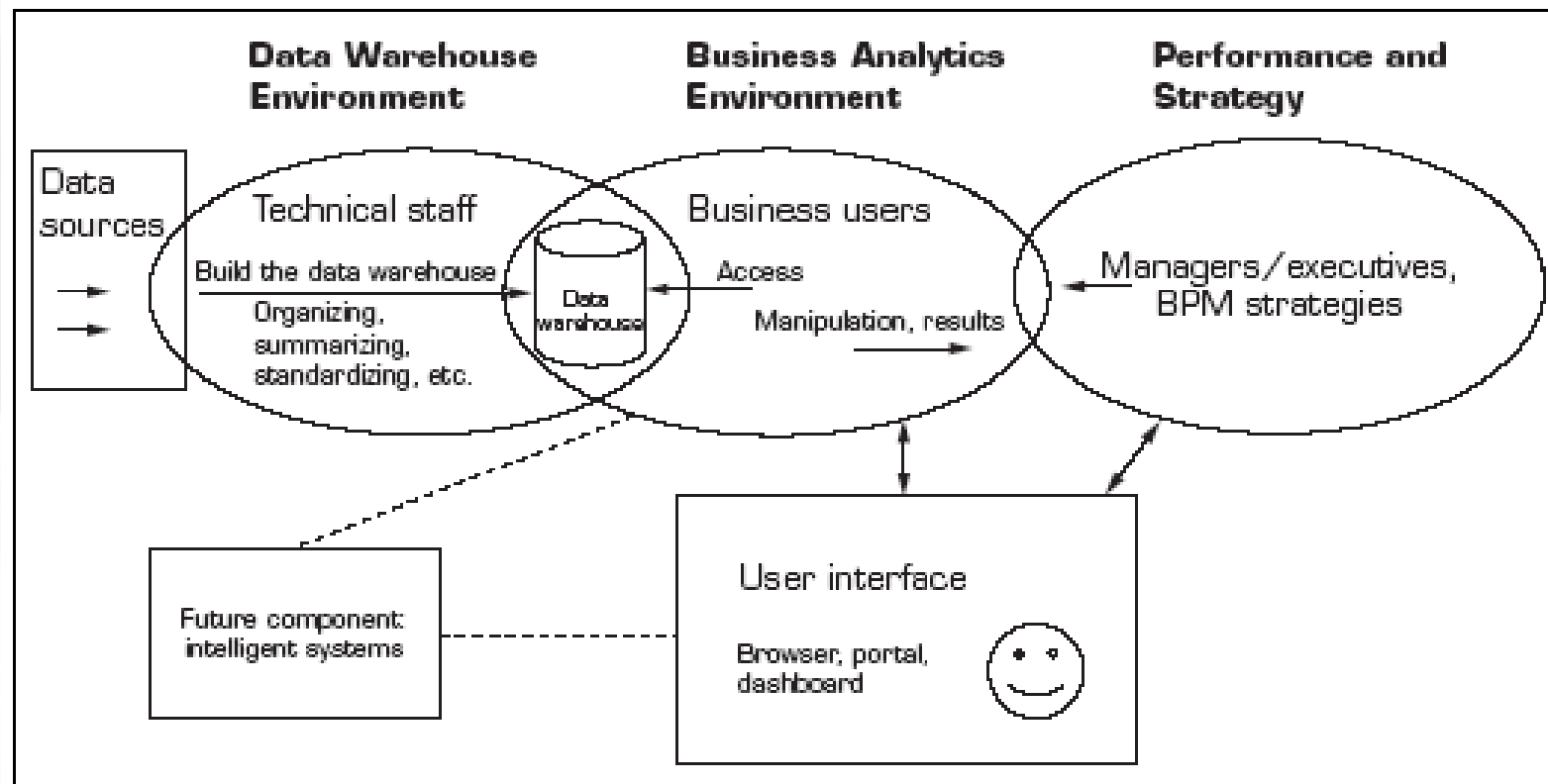# A Framework for Business Intelligence (BI)

Data Warehouse Environment

Business Analytics Environment

Performance and Strategy

Data sources

Technical staff

Build the data warehouse

Organizing, summarizing, standardizing, etc.

Data warehouse

Business users

Access

Manipulation, results

Managers/executives, BPM strategies

Future component: intelligent systems

User interface

Browser, portal, dashboard

FIGURE 1.7 A High-Level Architecture of BI

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Information Factory

An information factory has:

- *Inputs*
  - Data sources
  - Acquisition
- *Storage*
  - DW
  - Data marts

- *Processing of inputs*
  - Analysis
  - Data mining
- *Outputs*
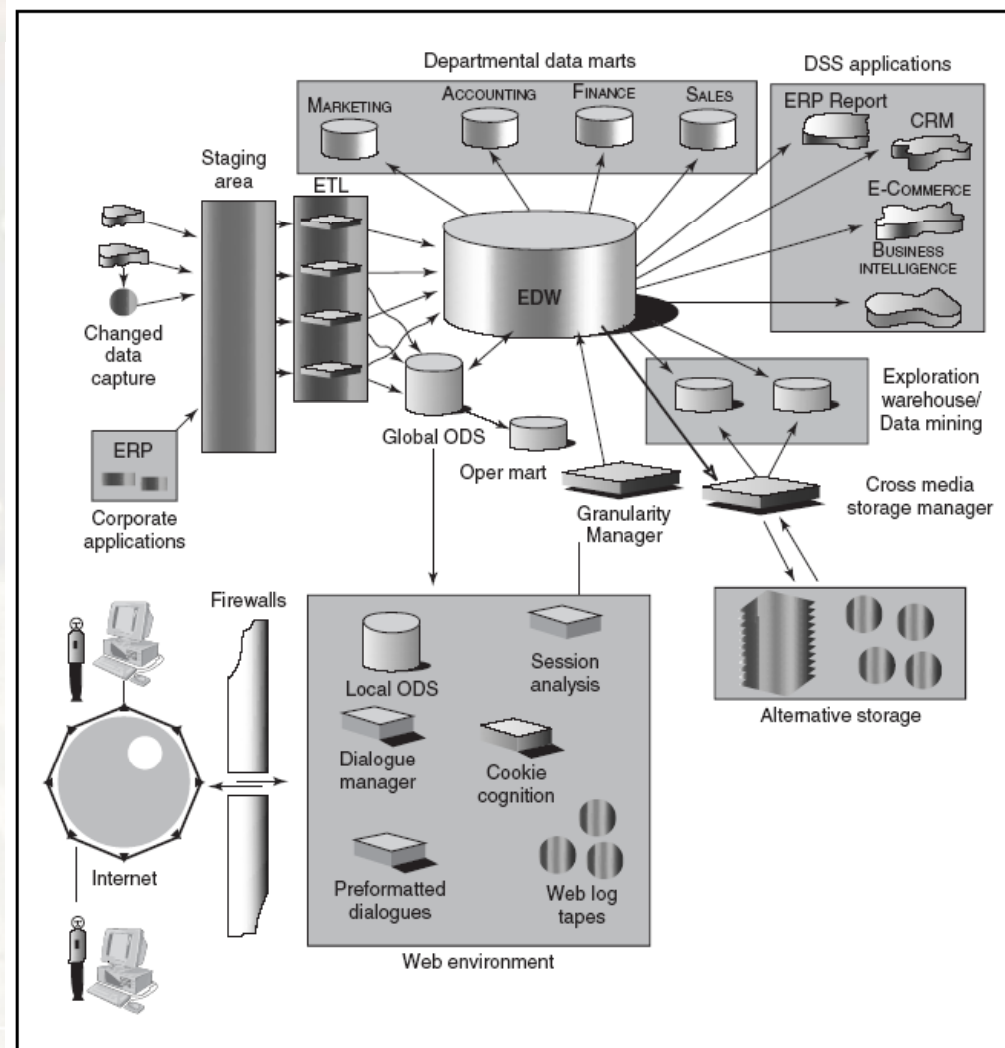 - Data delivery
  - BI applications

Information Factory

FIGURE S.2   The Corporate Information Factory

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BI: difference from OLTP

- Business intelligence is NOT transaction processing
  - **Online transaction processing (OTLP)**

    Each request is a transaction (computerized record of a discrete event)

    CRM, ERP are stored as OLTP

    "Black hole": information goes in but never comes back; hard for end-user ad-hoc queries, reports; everything should be programmed by IT staff
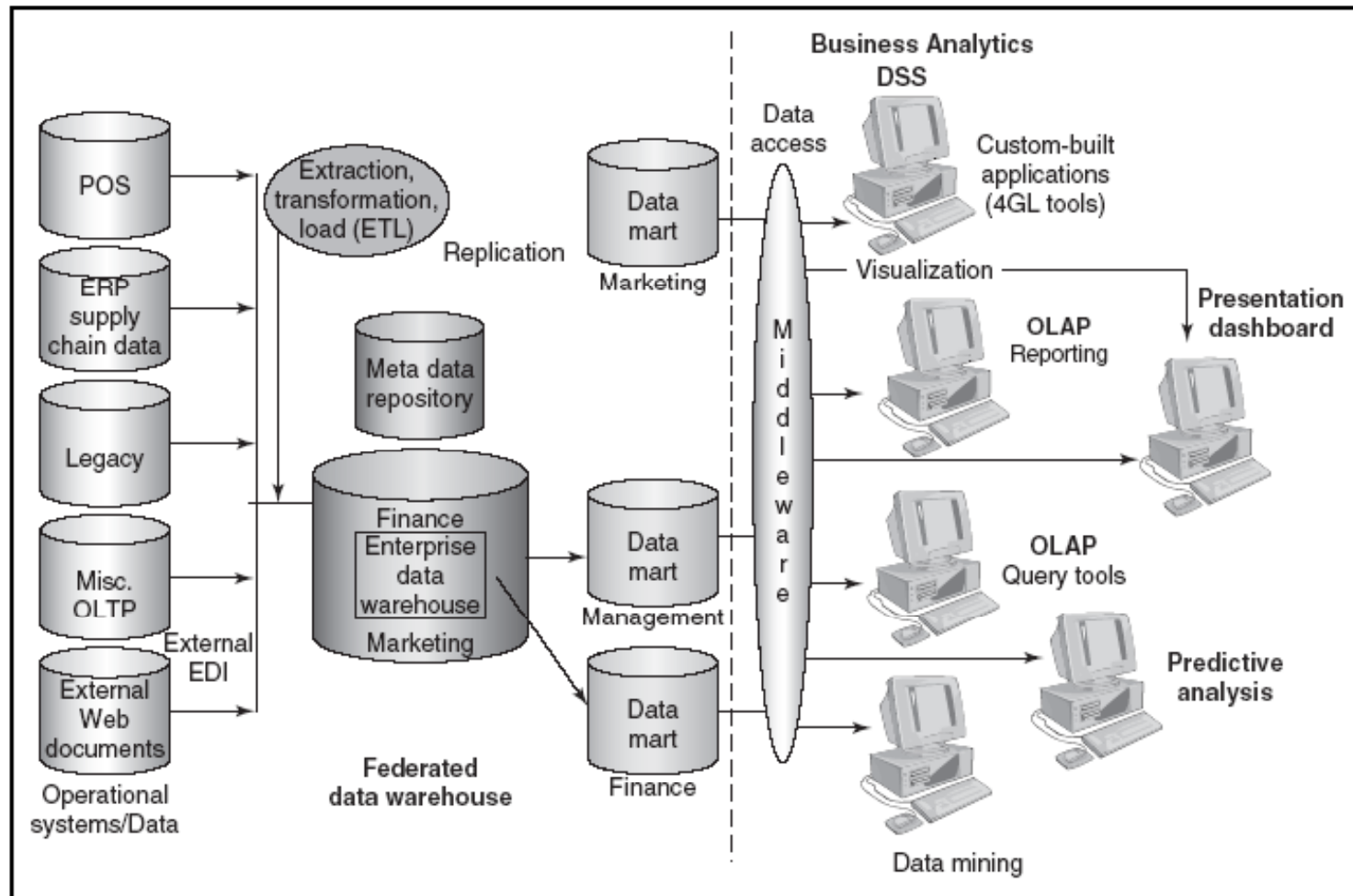
The role of DW

- Data warehouse
  - Data flows from operational systems (e.g., CRM, ERP) to a DW, which is a special database or repository of data that has been prepared to support decision-making applications ranging from those for simple reporting and querying to complex optimization

The role of DW

FIGURE S.4   The Major Components of Business Intelligence

OLAP

- To resolve the "black-hole" problem DW, OLAP, and BI were created
  - **Online analytical processing (OLAP)**

    Enables the user, while at a PC, to query the system, conduct an analysis, and so on. The result is generated in seconds

    http://www.dundas.com/Products/Chart/NET/OLAP/Multimedia/index.htm
    http://demos3.dundas.com/OlapDemo62/

Real-time DW

- Traditional BI systems use a large volume of *static* data

- Attaining real-time, on-demand BI
  - New data-generating technologies, e.g., RFID, is accelerating the need for real-time BI

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BI: Application Examples

TABLE S.1 Business Value of BI Analytical Applications

Analytic Application	Business Question	Business Value
Customer segmentation	What market segments do my customers fall into, and what are their characteristics?	Personalize customer relationships for higher satisfaction and retention.
Propensity to buy	Which customers are most likely to respond to my promotion?	Target customers based on their need to increase their loyalty to your product line. Also, increase campaign profitability by focusing on the most likely to buy.
Customer profitability	What is the lifetime profitability of my customer?	Make individual business interaction decisions based on the overall profitability of customers.
Fraud detection	How can I tell which transactions are likely to be fraudulent?	Quickly determine fraud and take immediate action to minimize cost.
Customer attrition	Which customer is at risk of leaving?	Prevent loss of high-value customers and let go of lower-value customers.
Channel optimization	What is the best channel to reach my customer in each segment?	Interact with customers based on their preference and your need to manage cost.

BI: who are the users?

Functionality	IT	Power Users	Executives	Functional Managers	Occasional Information Consumers	Extranet: Partners and Customers
						Types of Users
Number of users	Few	Dozens	Dozens	Dozens to hundreds	Hundreds to thousands	Hundreds to thousand
BI tools and functions	Developer, administrator, metadata, security, data management	Ad hoc query, OLAP reports, data mining, advanced analysis	Dashboard, scorecard, reports, CPM	Reports, spreadsheets, OLAP view, business activity monitoring (BAM), corporate performance management (CPM)	Reports, spreadsheets	Reports
Strategic value		High	High	Medium	Low	High

←···Intranet···→

←··
←Extranet→

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BI: why now?

- Organizations are being compelled to capture, understand, and harness their data to support decision making in order to improve business operations

- Business cycle times are now extremely compressed; faster, more informed, and better decision making is therefore a competitive imperative

- Managers need the *right information* at the *right time* and in the *right place*

Competitive Intelligence and Advantage

- Strategic imperative because:
  - Barriers to entry of a new competitor to an industry are being significantly diminished
  - An organization that has a strong position within its industry could easily face new competitors because the costs and other constraints to becoming a player in the market have decreased
  - Due to globalization:
    - Cheaper production
    - Cheaper delivery (FedEx, UPS, DHL)

Competitive Intelligence and Advantage

- Competitive intelligence (CI)
  - CI implies tracking what competitors are doing by gathering sources of materials on their recent and in-process activities
  - BI initiatives use some outside sources of data are included in the analysis process, but they are often available from third-party vendors
    - Demographic data

Competitive Intelligence and Advantage

- Competitive strategy in an industry
  - Focus on a particular *market niche*, perhaps through some form of product or service differentiation
  - BI applications in this context might include:
    - Making sure customer needs are met and loyalty is built
    - Tracking and remembering customer preferences in the next customer encounter

Developing a BI solution

- Developing or acquiring support systems
- Justification and cost-benefit analysis
  - Prioritizing the steps of BI
- Security and protection of privacy
  - BI handles critical information
- Integration of systems and applications
  - CRM, ERP, e-commerce, legacy
- The Web in DSS/BI implementation
  - Information portals and MSS
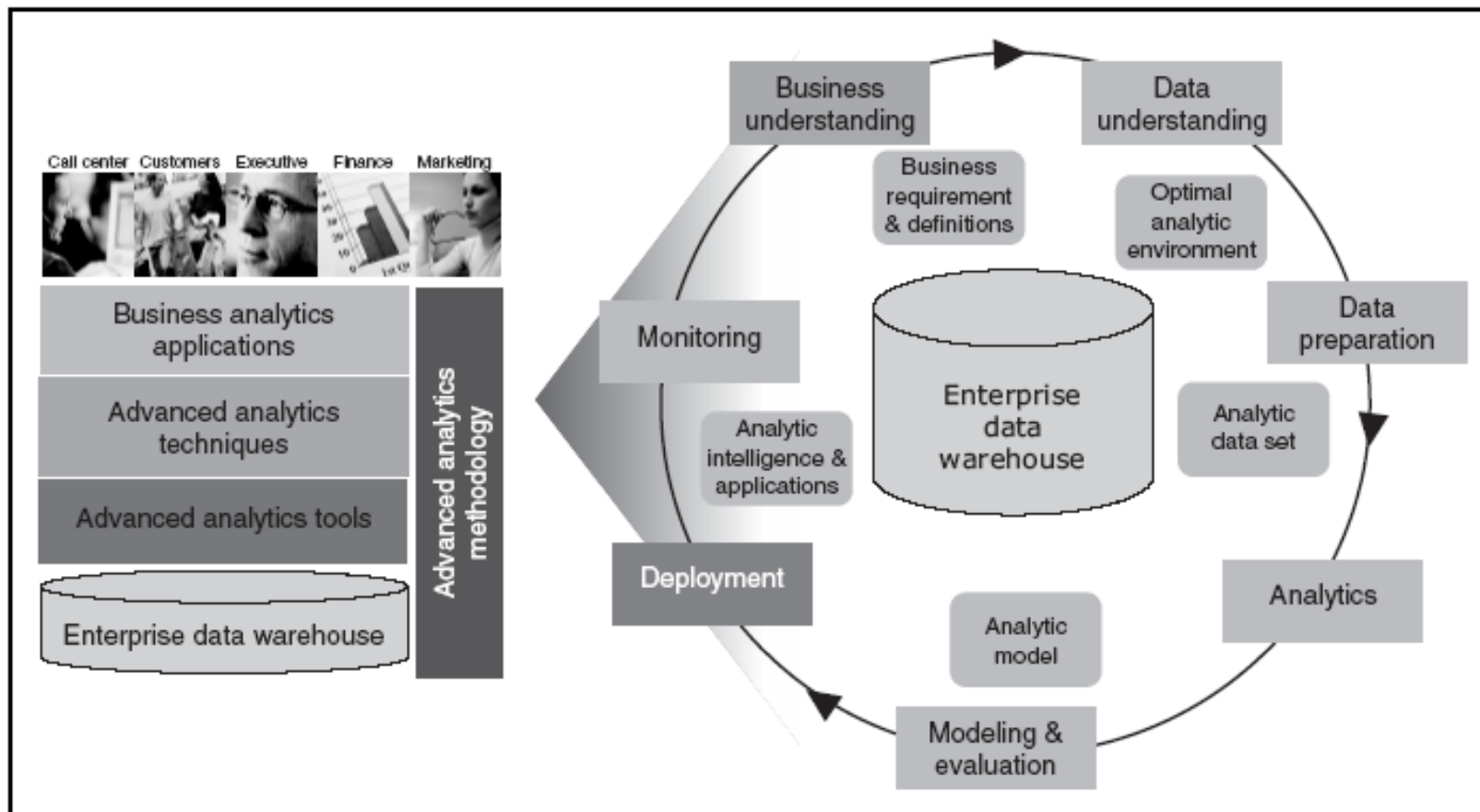
BI Development Cycle

FIGURE S.3   Teradata Advanced Analytics Methodology

General Process of Intelligence Creation and Use

- Intelligence creation and use and BI governance
  - **BI governance**

    Project prioritization process

  - Issues for the BI governance team is to address the following:
    - Creating categories of projects
    - Defining criteria for project selection
    - Determining and setting a framework for managing project risk
    - Managing and leveraging project interdependencies
    - Continually monitoring and adjusting the composition of the portfolio

Successful Business Intelligence Implementation

- The fundamental reasons for investing in BI must be aligned with the company's business strategy
  - Not a technical exercise for IT staff!

- BI must serve as a way to change the manner the company conducts business by improving its business processes and transforming decision-making processes to be more data driven

Successful Business Intelligence Implementation

- A framework for planning is a necessary precondition
  - At the business and organizational levels, it is important to define strategic and operational objectives while considering the available organizational skills to achieve those objectives
  - Upper managers must build enthusiasm for those initiatives and procedures for the intraorganizational sharing of BI best practices
  - Plans to prepare the organization for change must be in place

BI-how: Case study

- http://businessobjects.com/pdf/success/France_Telecom.pdf

Resources and links

- The Data Warehousing Institute
  - dw-institute.com
- DM Review
  - http://www.information-management.com/
- The OLAP Report
  - http://olapreport.com/
- DSS Resources
  - http://dssresources.com
- Information Technology Toolbox
  - http://businessintelligence.ittoolbox.com
- Business Intelligence Network
  - b-eye-network.com
- Kdnuggets
  - http://kdnuggets.com

Periodicals

- http://cioinsight.com
- http://technologyevaluation.com
- http://baselinemag.com
- http://tdwi.org
- http://advisor.com

BI Book's web site

- http://prenhall.com/turban