# BIT 3231 BUSINESS INTELLIGENCE AND INNOVATION

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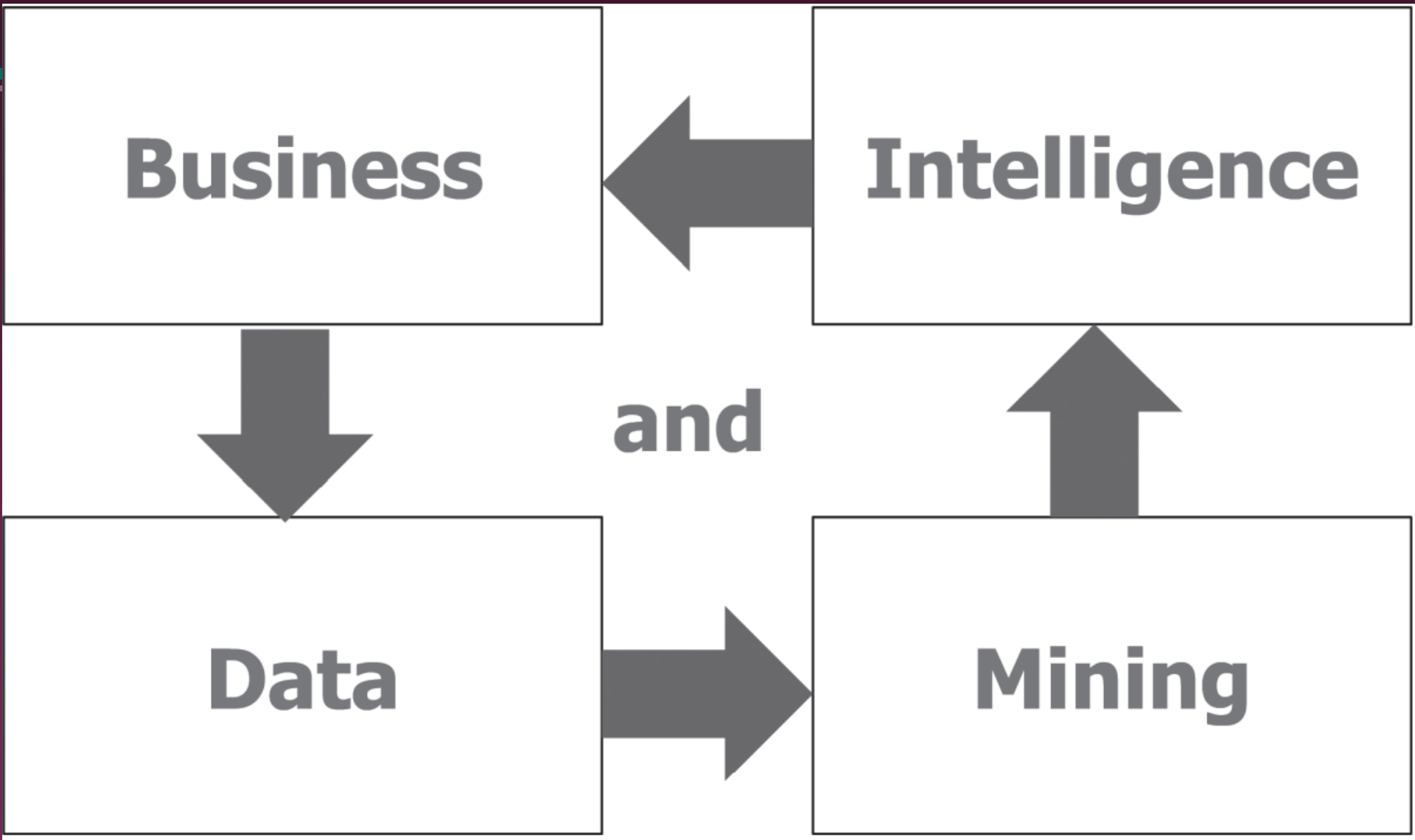
# Prologue

- Business: act of doing something productive to serve someone's needs, and thus earn a living, and make the world a better place.
- Business activities are recorded on paper or using electronic media, and then these records become data.
- The data is analyzed and mined using special tools and techniques to generate patterns and intelligence, which reflect how the business is functioning.
- These ideas can then be fed back into the business so that it can evolve to become more effective and efficient in serving customer needs.




*Business intelligence and data mining cycle*

# Introduction to Business Intelligence

# Business Intelligence

## Alternative definitions

- BI : set of information technology (IT) solutions that includes tools for gathering, analyzing, and reporting information to the users about performance of the organization and its environment.
- BI: set of techniques which assist in spotting, digging out and investigating best data from the large amount of data to improve conclusion making. Let us understand the concept better with help of an example.
- BI: umbrella term that includes a variety of IT applications that are used to analyze an organization’s data and communicate the information to relevant users.

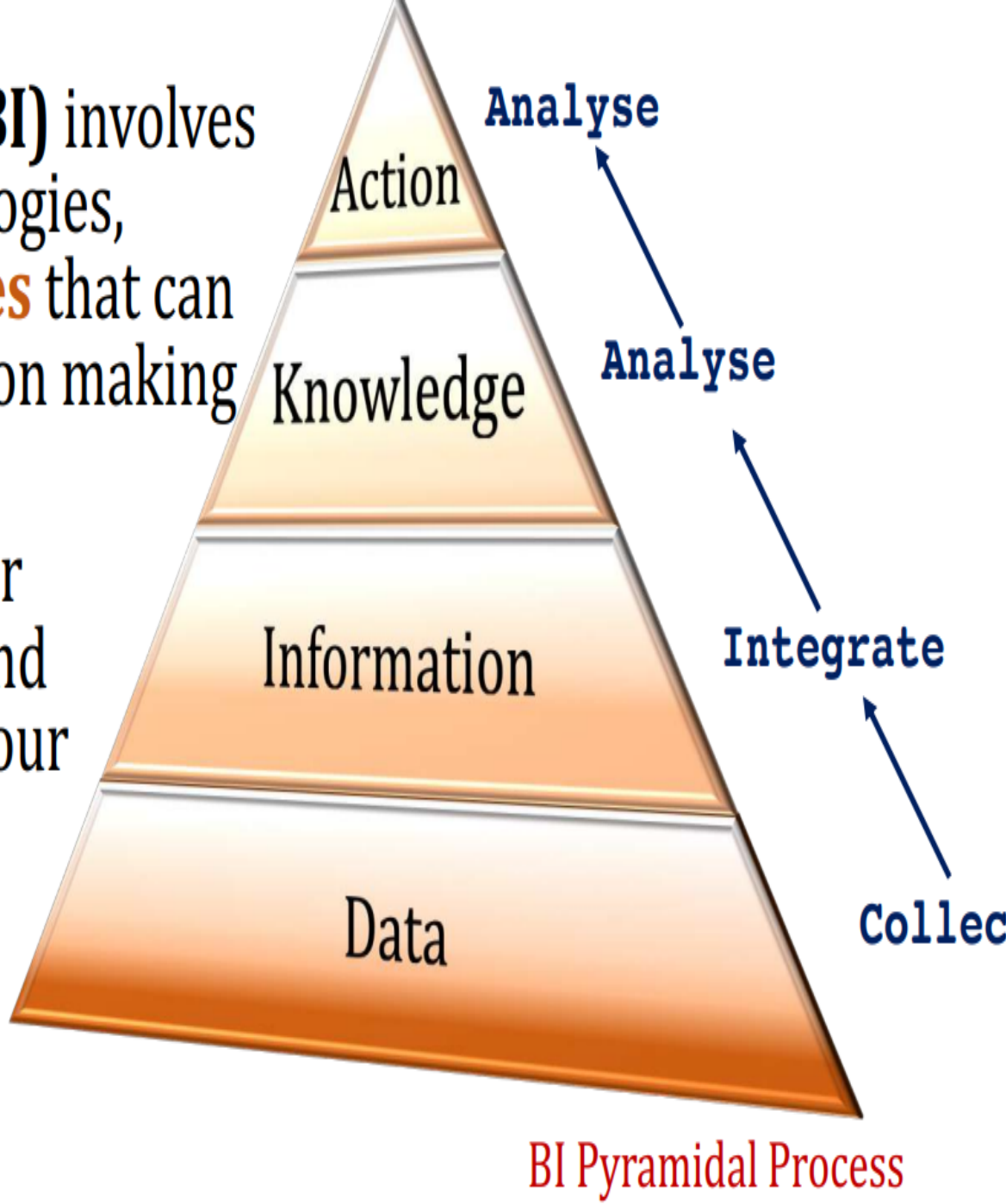
# Data in Business Intelligence

Data:

1. Anything that is recorded.
2. Observations and facts.
3. Anecdotes and opinions.
4. Numbers, such as the record of daily weather or daily sales.
5. Alphanumeric, such as the names of employees and customers.

Thus data becomes the new natural resource. Therefore, Data lies at the heart of business intelligence

- **Business Intelligence (BI)** involves **skills**, processes, technologies, applications and **practices** that can be used to support decision making in an organization.
- **BI** as a new technology for understanding the past and predicting the future of your business.
- ***Knowledge*** as a part of the BI Process




BI Pyramidal Process

# Cont...

- Today, organizations have an extensive collection of data and information of multiple varieties.
- These data can be stored in data warehouses / Data Centres.
  - Ex.: UR Data (Marks, Finance, Students, Staff, Courses, IT systems/Infrastructure…etc)
- For extracting value (meaning) from the data storages, these companies try to utilize BI technology.
- BI systems allow organizations to collect, access, analyze, and share information and knowledge.

# BI as Techniques and Tools

- Also, BI may refers to a set of techniques and tools (IT applications):
  - Used for transforming raw data into meaningful information for organizational business analysis.
- Data Mining techniques of BI are used to perform data classification, clustering, or predictions for future business planning
- Specific Knowledge is needed in today's business for:
  i. Driving innovation:
     - Product Innovation
     - Service Innovation
     - Process Innovation
  ii. Enable creativity: (using new knowledge)

# Data Processing Chain

- A sequence of steps to be followed to benefit from the data in a systematic way.

1. Data can be modeled and stored in a database.
2. Relevant data can be extracted from the operational data stores according to certain reporting and analyzing purposes, and stored in a data warehouse.
3. The data from the warehouse can be combined with other sources of data, and mined using data mining techniques to generate new insights.
4. The insights need to be visualized and communicated to the right audience in real time for competitive advantage.

The diagram is shown in the following slid

# Data Processing Chain


*Data processing chain*

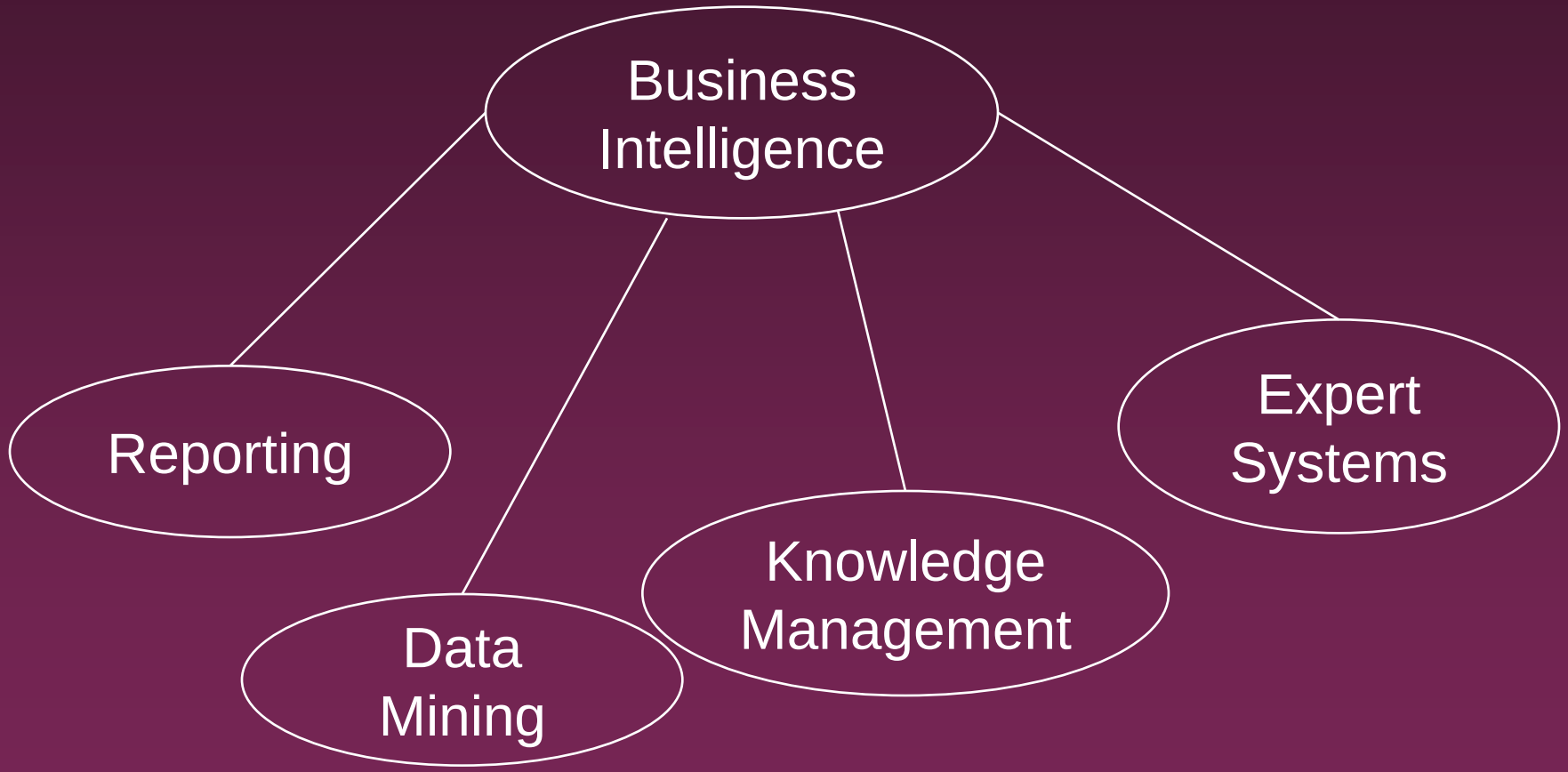
Brief,

BI is a Technology-driven process for analyzing data and delivering actionable information that helps executives, managers and workers make informed business decisions.

# Toyota uses BI to Excel

1. *In what ways did the old information systems create problems for Toyota?*
2. *What information needs of managers are satisfied by the new BI system? What decisions are satisfied by the BI support?*
3. *Relate the TLS problem to the supply chain (from factories, to dealers, to consumers).*
4. *List the decision support tools cited here.*
5. *What strategic advantage can Toyota derive from this system?*
6. *Relate Toyota's decision to make consumer-helping robots to the changing business environment.*

# Business Intelligence



# Why Business Intelligence?

- Better decisions with greater speed and confidence
- Recognize and maximize firm's strengths
- Shorten marketing efforts
- Improve customer relationships
- Align effort with firm strategy
- Improve revenue and profit

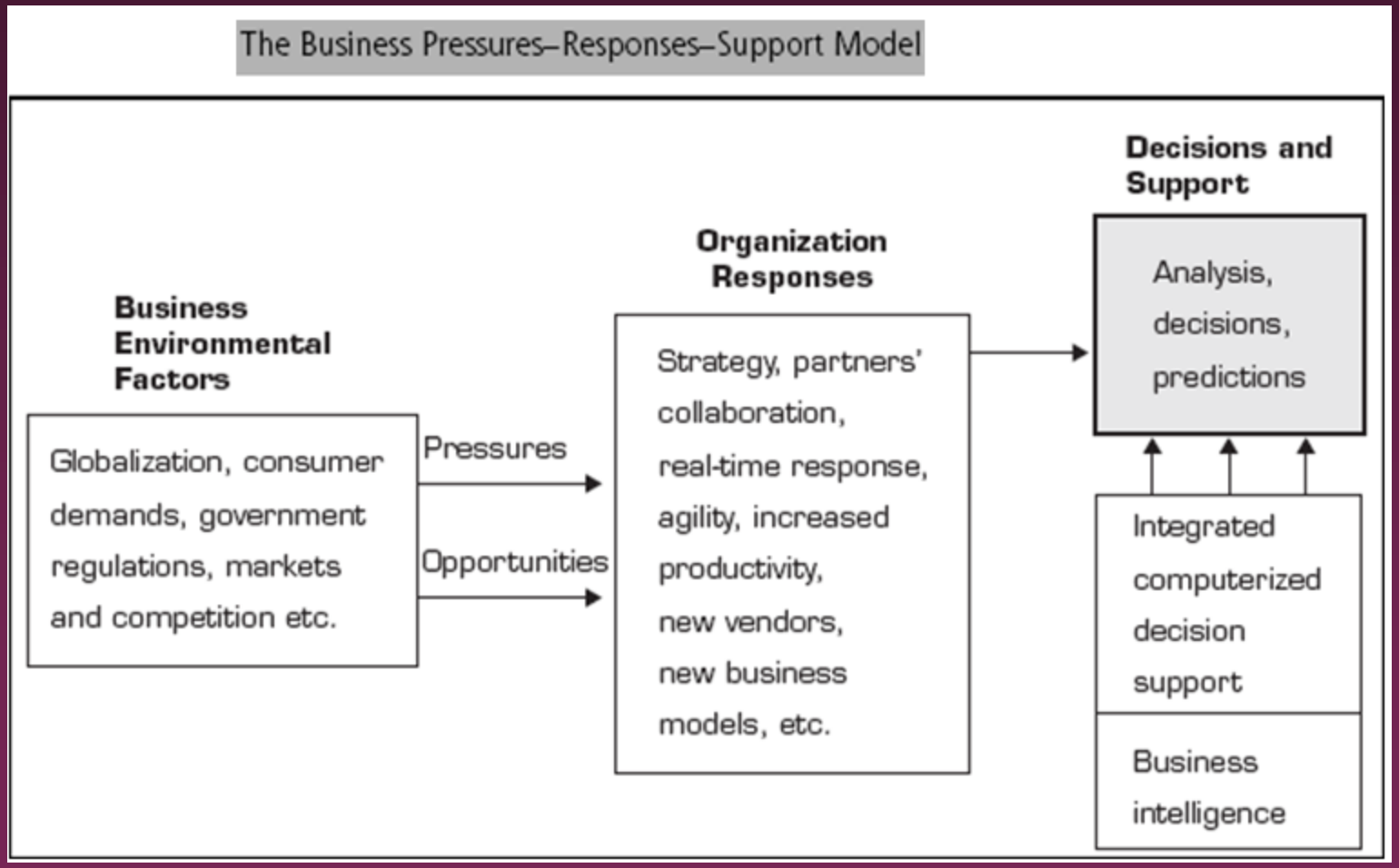
# Elements of Business Intelligence

- **Data Gathering**
  - Information capture
- **Analysis**
  - Understanding the context of information
- **Distribution**
  - Timely delivery to the right people who can act on it

# Changing Business Environments and Computerized Decision Support

- The Business Pressures-Responses-Support Model
  - The business environment
  - Organizational responses: be reactive, anticipative, adaptive, and proactive
  - Computerized support
    - **Closing the Strategy Gap** One of the major objectives of BI is to facilitate closing the gap between the current performance of an organization and its desired performance as expressed in its mission, objectives, and goals and the strategy for achieving them

# Changing Business Environments and Computerized Decision Support



# A Framework for Business Intelligence (BI)

- **Business intelligence (BI)**

  A conceptual framework for decision support. It combines architecture, databases (or data warehouse), analytical tools and applications
- Remember that we defined *business analytics (BA)* to include the access, reporting, and analysis of data supported by software to drive business performance and decision making
- From our perspective, BA and BI are the essentially the same thing

# A Framework for Business Intelligence

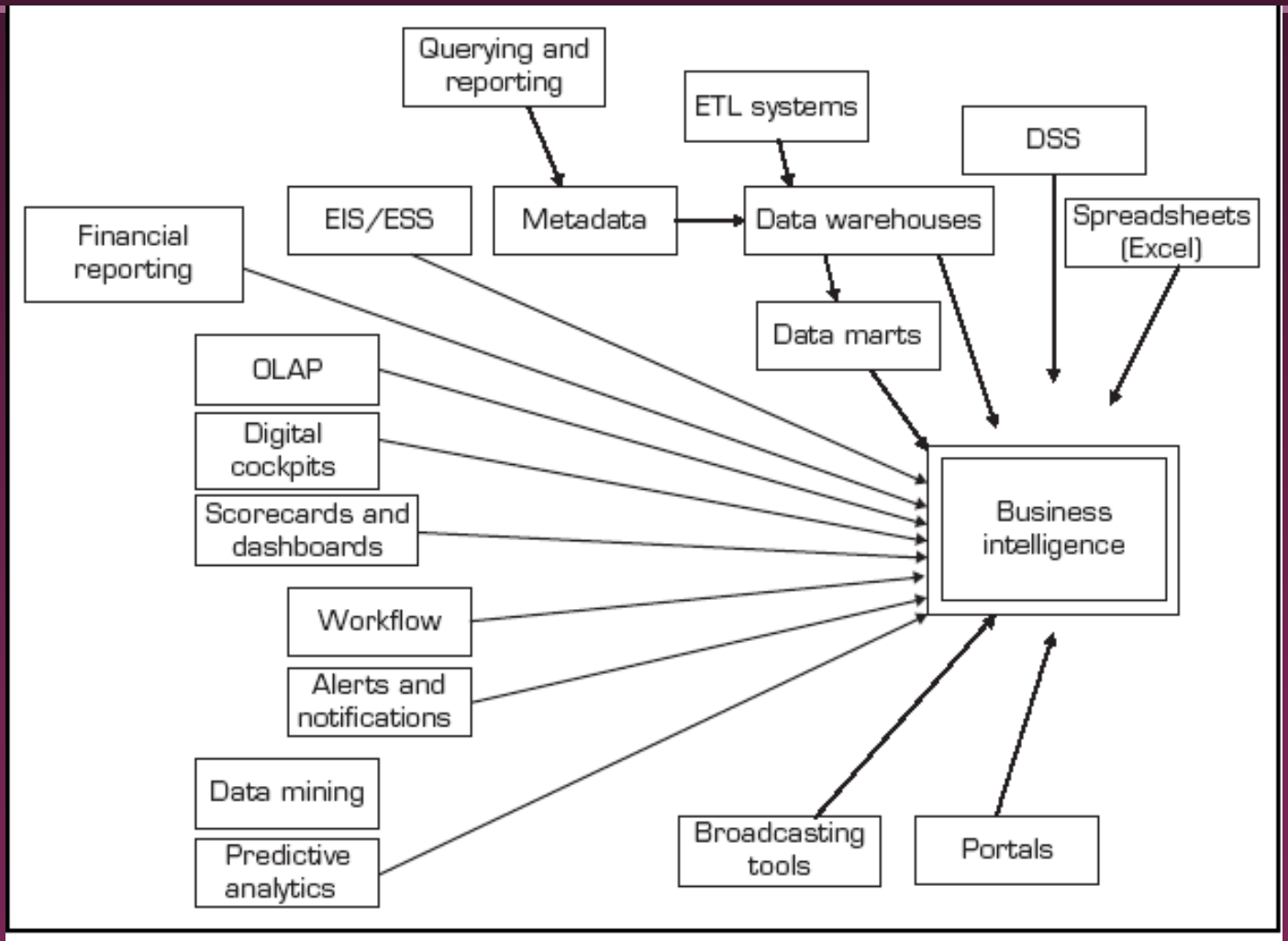



FIGURE 1.2 Evolution of BI

# A Framework for Business Intelligence (BI)

- **The Origins and Drivers of Business Intelligence**
  - Organizations are being compelled to capture, understand, and harness their data to support decision making in order to improve business operations
  - Managers need the *right information* at the *right time* and in the *right place*

# A Framework for Business Intelligence (BI)

- **BI's Architecture and Components**
  - **Data Warehouse**
  - **Business Analytics**
  - **Performance and Strategy**
  - **User Interface**

# A Framework for Business Intelligence (BI)

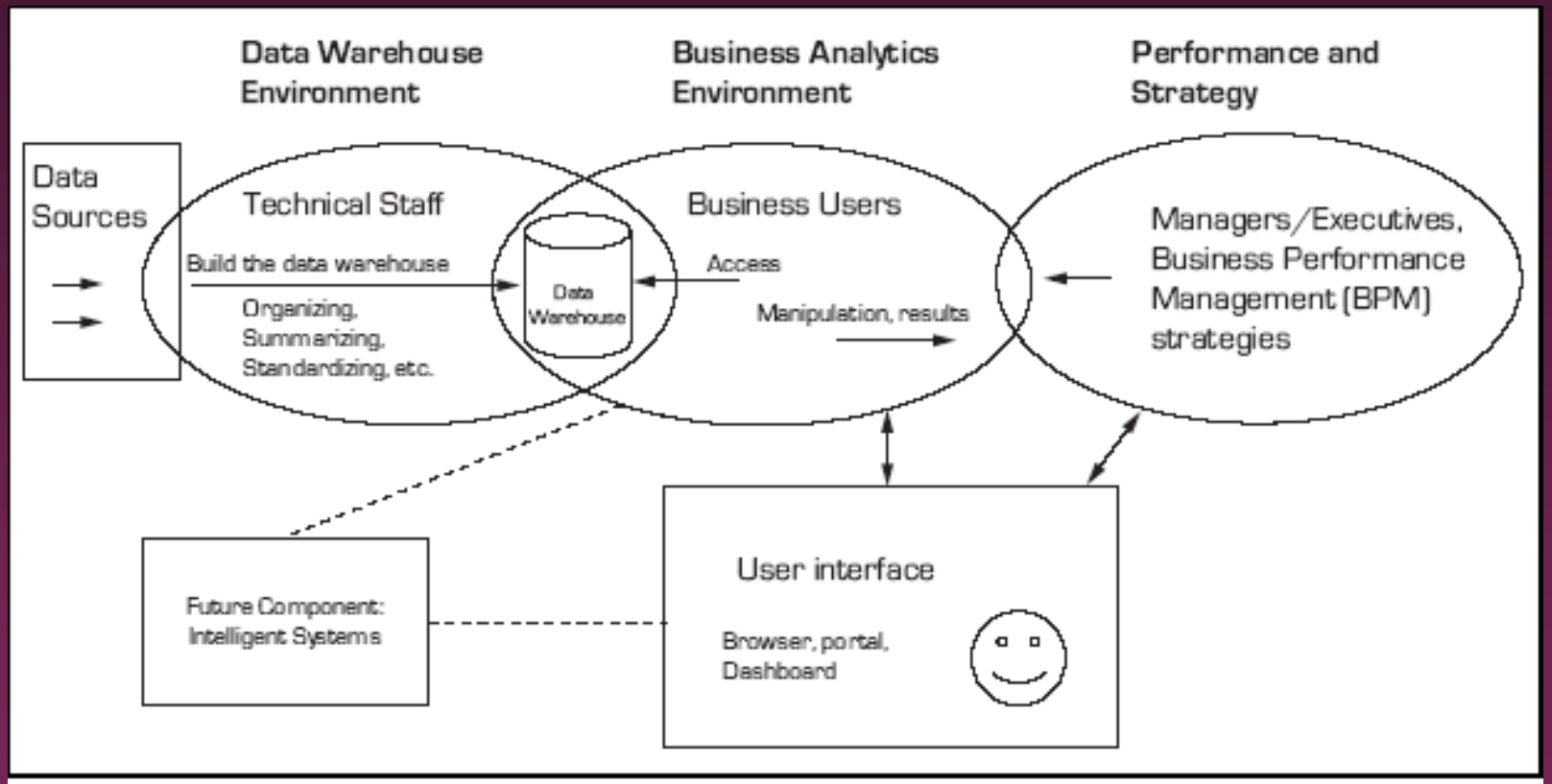



FIGURE 1.3 A High Level Architecture for BI

# A Framework for Business Intelligence (BI)

- **BI's Architecture and Components**
  - **Data Warehouse**
    - Data obtained from operational systems needed to support decision making

# A Framework for Business Intelligence (BI)

- **BI's Architecture and Components**
  - **Business Analytics**
    - Create on-demand reports and queries and analyze data (originally called online analytical processing – OLAP)
    - **Automated decision systems**: rule – based
      - App. Case 1.1 – price setting example
    - **Data Mining:** a class of information analysis based on databases that looks for hidden patterns in a collection of data which can be used to predict future behavior

# A Framework for Business Intelligence (BI)

- **BI's Architecture and Components**
  - **business (or corporate) performance management (BPM)**

    A component of BI based on the *balanced scorecard* methodology, which is a framework for defining, implementing, and managing an enterprise's business strategy by linking objectives with factual measures

# A Framework for Business Intelligence (BI)

- **BI's Architecture and Components**
  - **User Interface: Dashboards and Other Information Broadcasting Tools**
    - **Dashboards**

      A visual presentation of critical data for executives to view. It allows executives to see hot spots in seconds and explore the situation
  - Examples of dashboards and scorecards:

    http://www.idashboards.com/?gclid=CIDDrpLR05QCFQNaFQodSWDQkQ

# A Framework for Business Intelligence (BI)

- **The Benefits of BI**
  - Time savings
  - Single version of truth
  - Improved strategies and plans
  - Improved tactical decisions
  - More efficient processes
  - Cost savings
  - Faster, more accurate reporting
  - Improved decision makin
  - Improved customer service
  - Increased revenue

*Many benefits are intangible*

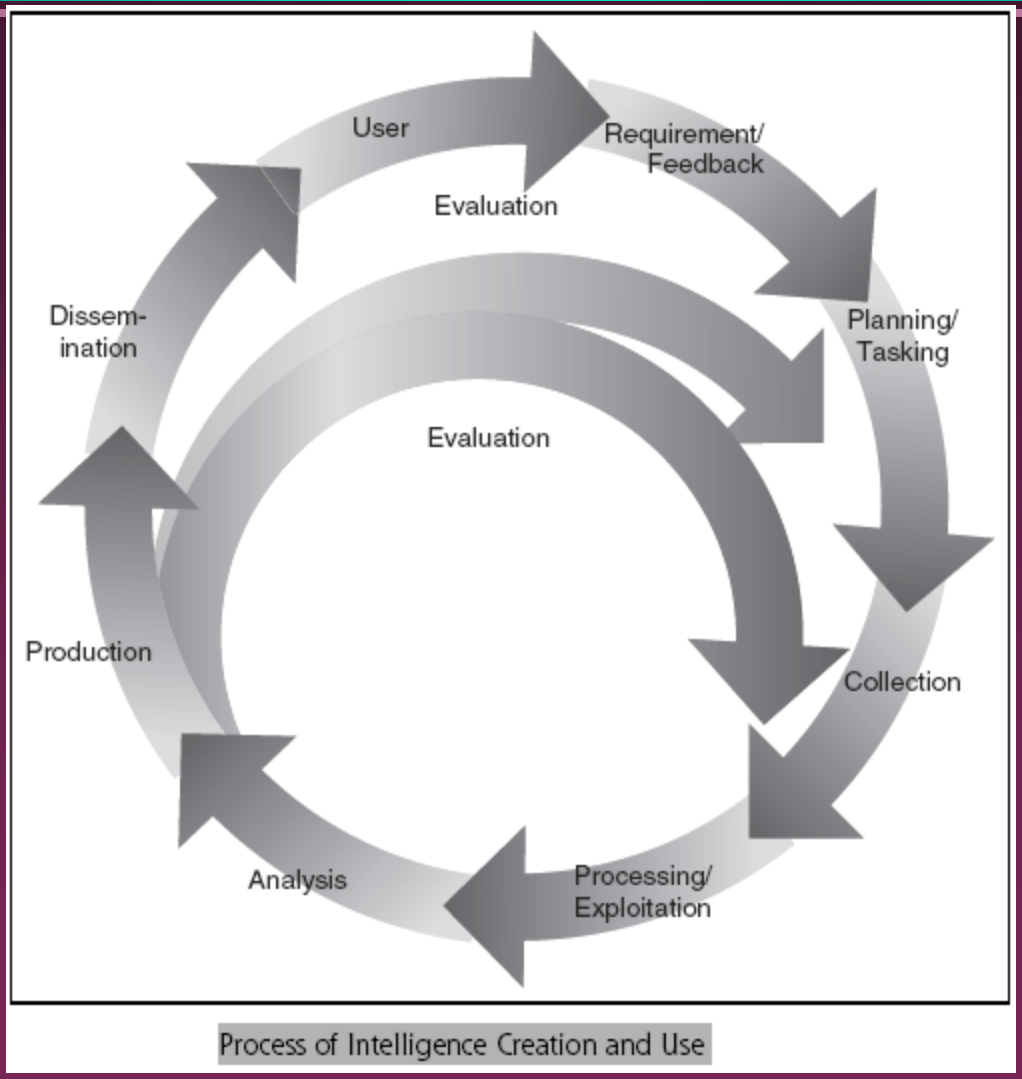
# A Framework for Business Intelligence (BI)

- **The Business Value of BI**
  - **How BI Can Help**
    - Assess the readiness for meeting the challenges posed by these new business realities
    - Take a holistic approach to BI functionality
    - Leverage best practices and anticipate hidden costs

# A Framework for Business Intelligence (BI)

- **The Business Value of BI**
  - **Key Issues and Framework for BI Analysis**
    - How can enterprises maximize their BI investments?
    - What BI functionality do enterprises need, and what are they using today?
    - What are some of the hidden costs associated with BI initiatives?

# Intelligence Creation and Use and BI Governance




Process of Intelligence Creation and Use

# Intelligence Creation and Use and BI Governance

- The general process of intelligence creation starts by identifying and prioritizing specific projects
- The project prioritization process within organizations is sometimes called **BI Governance**

# Intelligence Creation and Use and BI Governance

- **A typical set of issues for the BI governance team is to address**
  1. Creating categories of projects (investment, business opportunity, strategic, mandatory, etc.)
  2. Defining criteria for project selection
  3. Determining and setting a framework for managing project risk
  4. Managing and leveraging project interdependencies
  5. Continually monitoring and adjusting the composition of the portfolio

# Intelligence Creation and Use and BI Governance

- **Intelligence Gathering**
  - How modern companies ethically and legally organize themselves to glean as much information as they can from their:
    - Customers
    - Business environment
    - Stakeholders
    - Business processes
    - Competitors
    - Other sources of potentially valuable information

# Intelligence Creation and Use and BI Governance

- **Intelligence Gathering**
  - In order to be useful in decision making and improving the bottom line, the data must be:
    - Cataloged
    - Tagged
    - Analyzed
    - Sorted
    - Filtered
  - These activities are part of the BI creation cycle

# The Major Theories and Characteristics of Business Intelligence

- **online transaction processing systems (OLTP)**

  Systems that handle a company's routine ongoing business
- **online analytic processing (OLAP)**

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

# The Major Theories and Characteristics of Business Intelligence

- **Some Theories of BI**
  - **A factory and warehouse**
  - **The information factory**
  - **Data warehousing and business intelligence**
  - **Teradata advanced analytics methodology**
  - **Oracle BI system**

# Toward Competitive Intelligence and Advantage

- **The Strategic Imperative of BI**
  - Barriers to entry of a new competitor are being significantly diminished
  - Because of the Web revolution and increasing globalization, companies throughout the world are challenging major players in industries
  - The ability to deliver goods worldwide is making it easier for potential competitors to get products and services to more customers almost anywhere
  - Companies are finding better or less expensive suppliers all over the globe

# Successful Business Intelligence Implementation

- **The Typical BI User Community**
  - IT staff
  - Power users
  - Executives
  - Functional managers
  - Occasional information customers
  - Partners
  - Consumers

  Each group uses different BI tools and functions at varying levels of strategic importance

# Successful Business Intelligence Implementation

- **Appropriate Planning and Alignment with the Business Strategy**
  - Planning and execution components
    - Business
    - Organization
    - Functionality
    - Infrastructure
  - Define objectives while considering organization's skills, plan for change, prepare action plan
- **Establish a BI Competency Center (BICC) within the Company**
  - Support dissemination, training, and best practices

# Conclusion: Business Intelligence Today and Tomorrow

- Today's organizations are deriving more value from BI by extending actionable information to many types of employees, maximizing the use of existing data assets
- Visualization tools including dashboards are used by producers, retailers, governments, and special agencies

# Why Business Intelligence Fails

- Failure to recognize the breadth of the problem (not just financial system)
- No Top Down support
- Lack of standardize procedures or processes
- Bad quality of information – Dirty Data
- Computer systems impede rather than enhance BI efforts

# Conclusion: Business Intelligence Today and Tomorrow

- More and more industry-specific analytical tools will flood the market to perform almost any kind of analysis and to facilitate informed decision making from the top level to the user level
- A potential trend involving BI is its possible *merger with artificial intelligence* (AI)

Thank you for your attention