Introduction to Essentials
for Information Systems

Eleventh Edition

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C h a p t e r

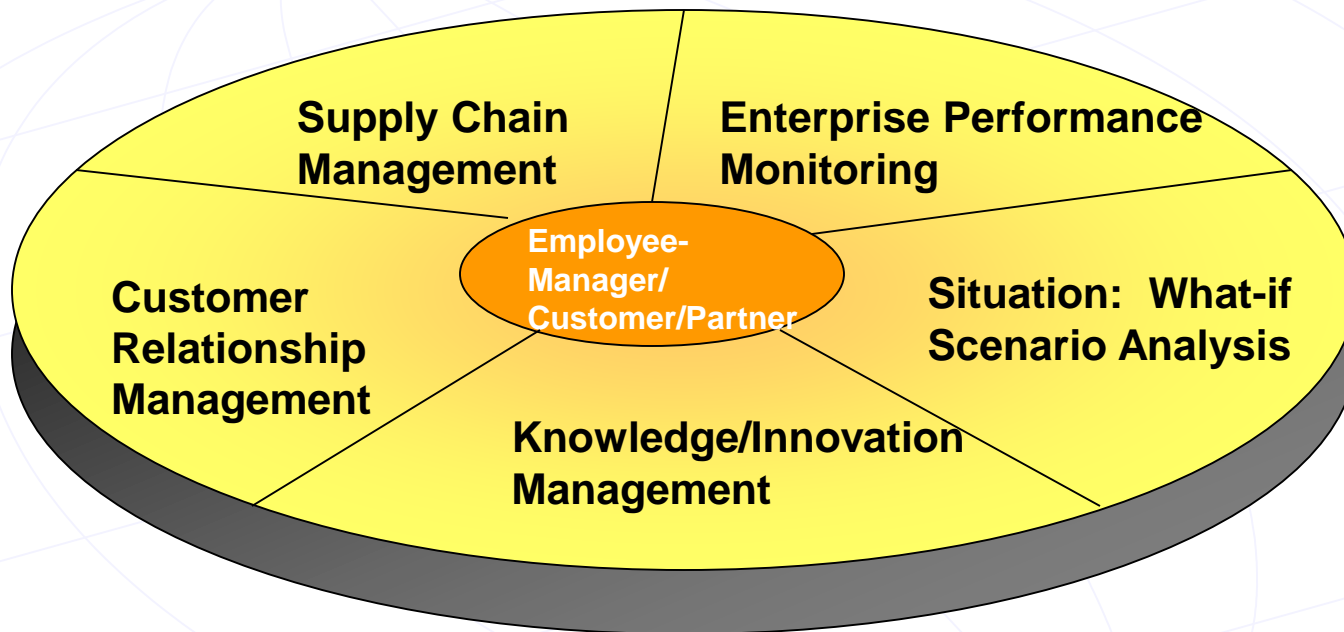# Decision

Support

Systems

Chapter Objectives

- Identify the changes taking place in the form and use of decision support in e-business enterprises.

- Identify the role and reporting alternatives of management information systems.

- Describe how online analytical processing can meet key information needs of managers.

- Explain the decision support system concept and how it differs from traditional management information systems.
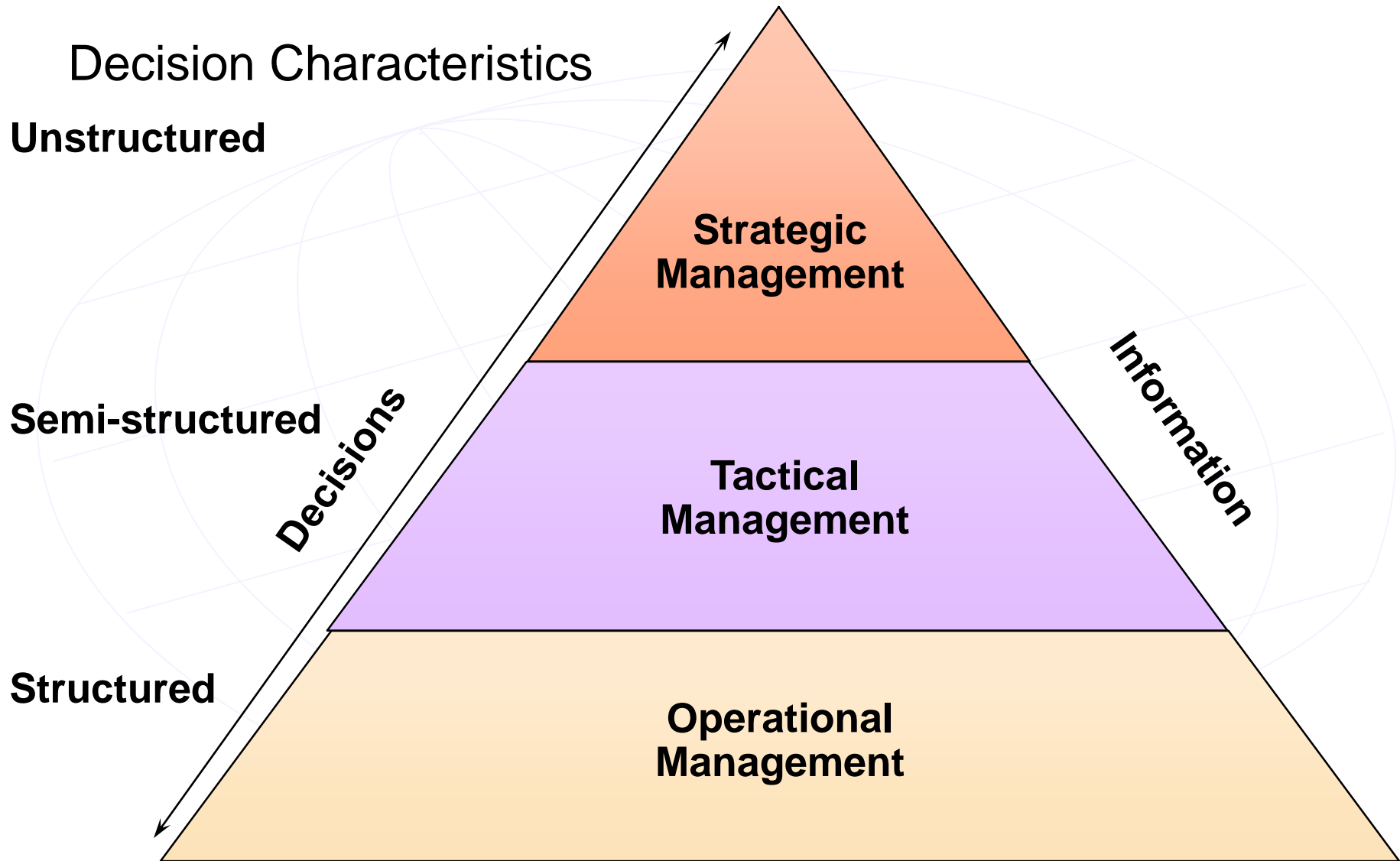
Chapter Objectives

- Explain how the following information systems can support the information needs of executives, managers, and business professionals:
  - A) Executive Information Systems
  - B) Enterprise Information Portals
  - C) Enterprise Knowledge Portals
- Identify how neural networks, fuzzy logic, genetic algorithms, virtual reality, and intelligent agents can be used in business.
- Give examples of several ways expert systems can be used in business decision-making situations.

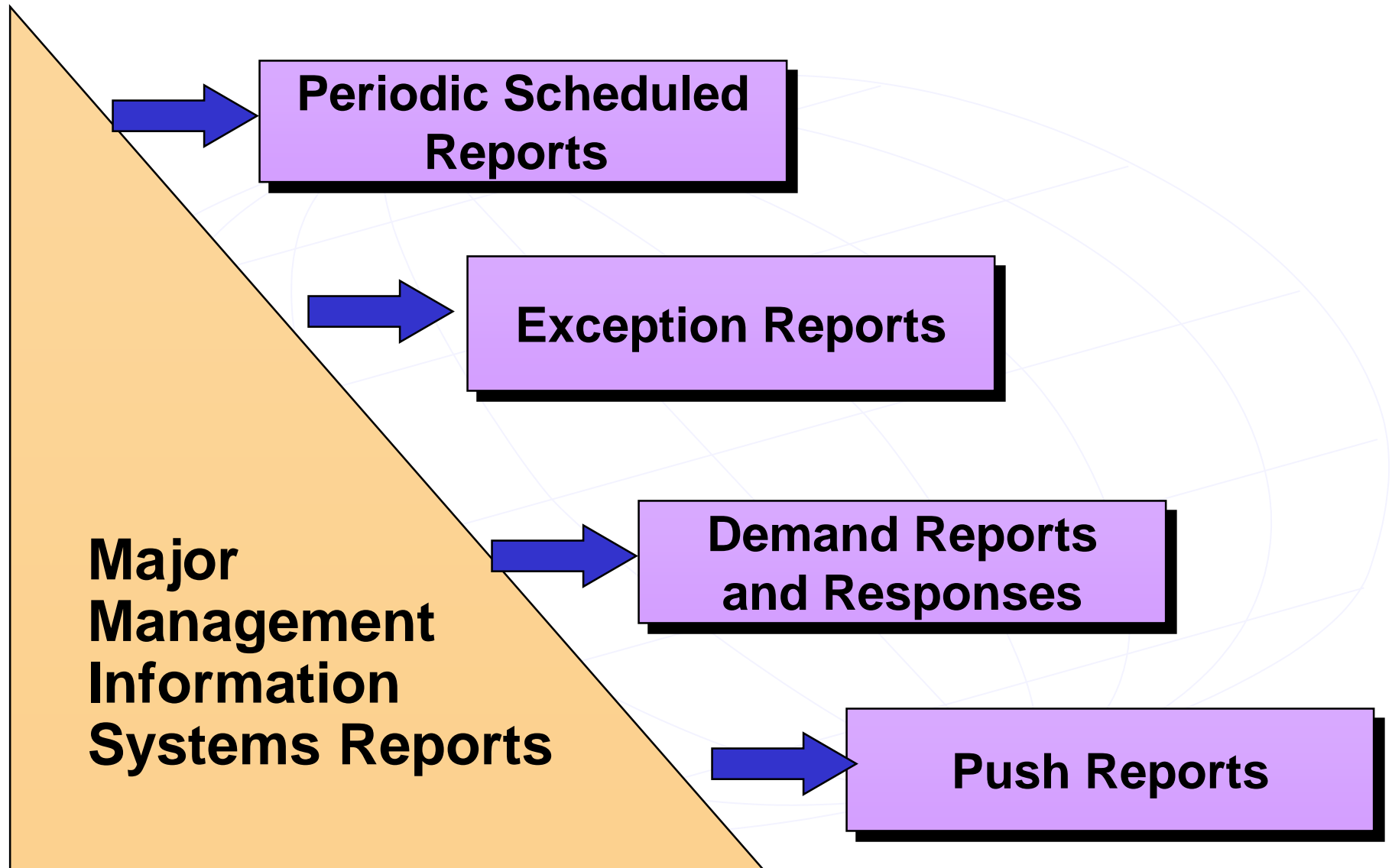# e-Business Decision Support Applications

Decisions in the e-Business

Decision Characteristics

Unstructured

Semi-structured

Structured

Decisions

Information

Strategic Management

Tactical Management

Operational Management

Management Information System Reports

Major Management Information Systems Reports

→ **Periodic Scheduled Reports**

→ **Exception Reports**

→ **Demand Reports and Responses**

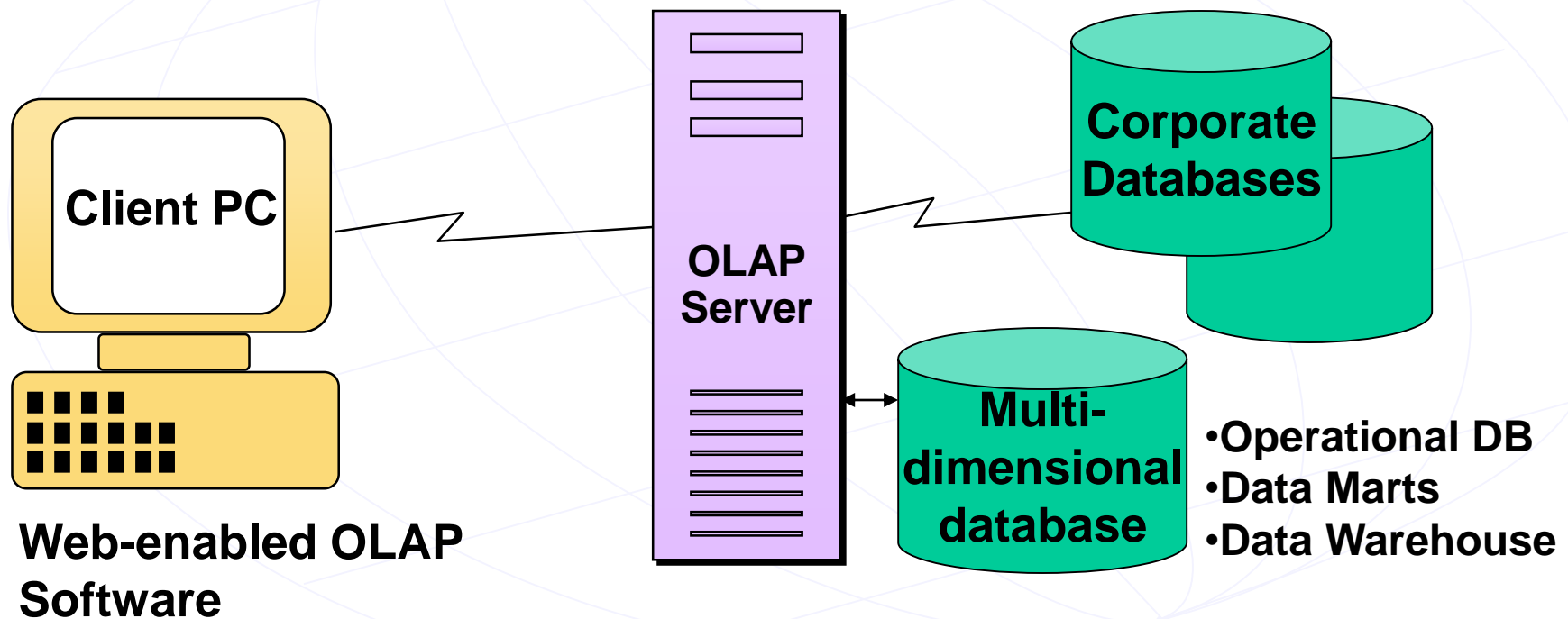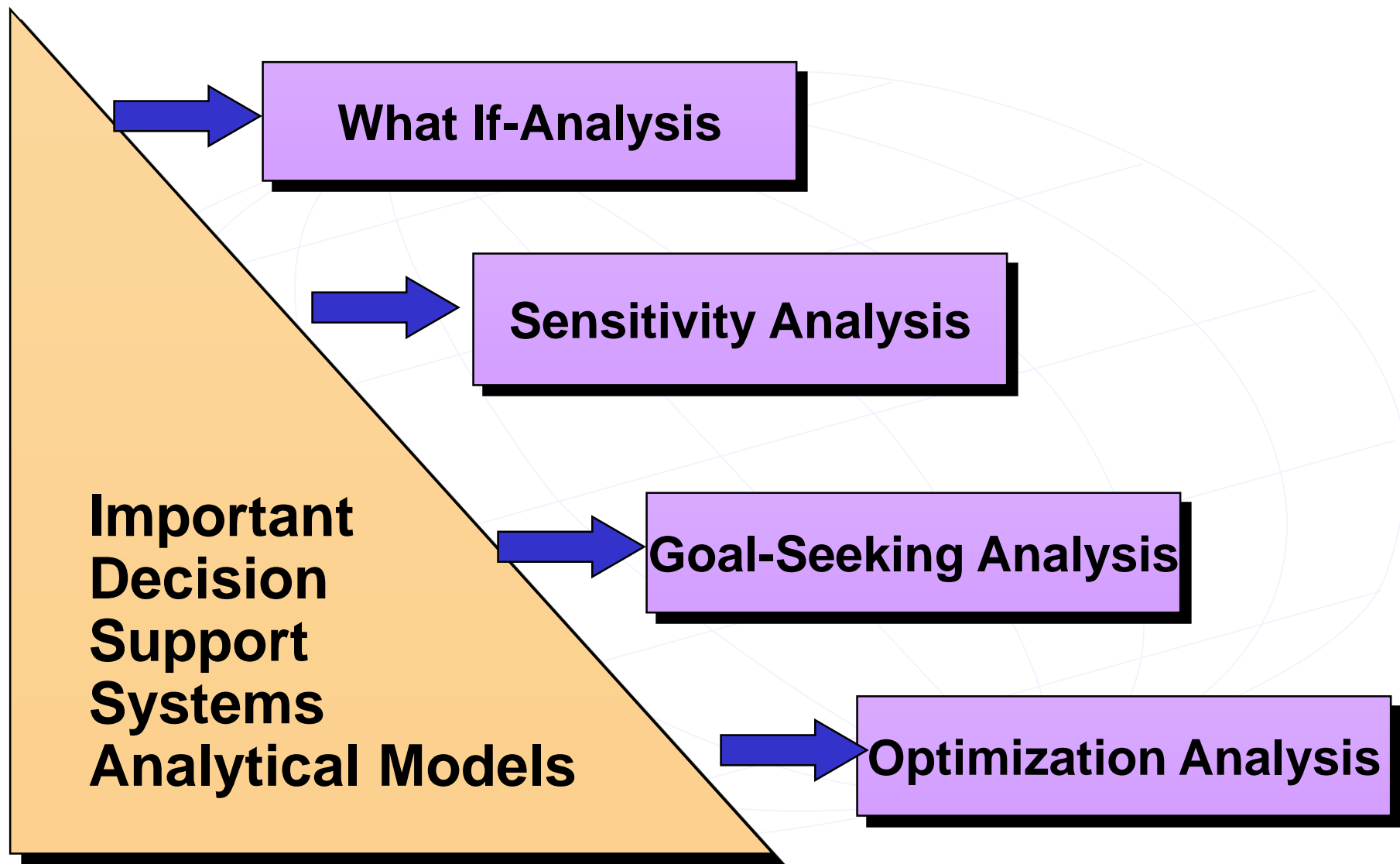→ **Push Reports**

Online Analytical Processing

Data is retrieved from corporate databases and staged in an OLAP multi-dimensional database

Client PC

Web-enabled OLAP Software

OLAP Server

Corporate Databases

Multi-dimensional database

- **Operational DB**
- **Data Marts**
- **Data Warehouse**

Decision Support Systems

What If-Analysis

Sensitivity Analysis

Goal-Seeking Analysis

Optimization Analysis

Important Decision Support Systems Analytical Models

Enterprise Information Portals and DSS

Internet

Intranet

Extranet

Enterprise Information Portal Gateway

Enterprise Information Portal User Interface

Search Agents

OLAP

Data Mining

DSS

What-If Models
Sensitivity Models
Goal-Seeking Models
Optimization Models

Knowledge Management

Database Management Functions

Data Mart

Operational Database

Other Business Applications

Analytical Database

Knowledge Base
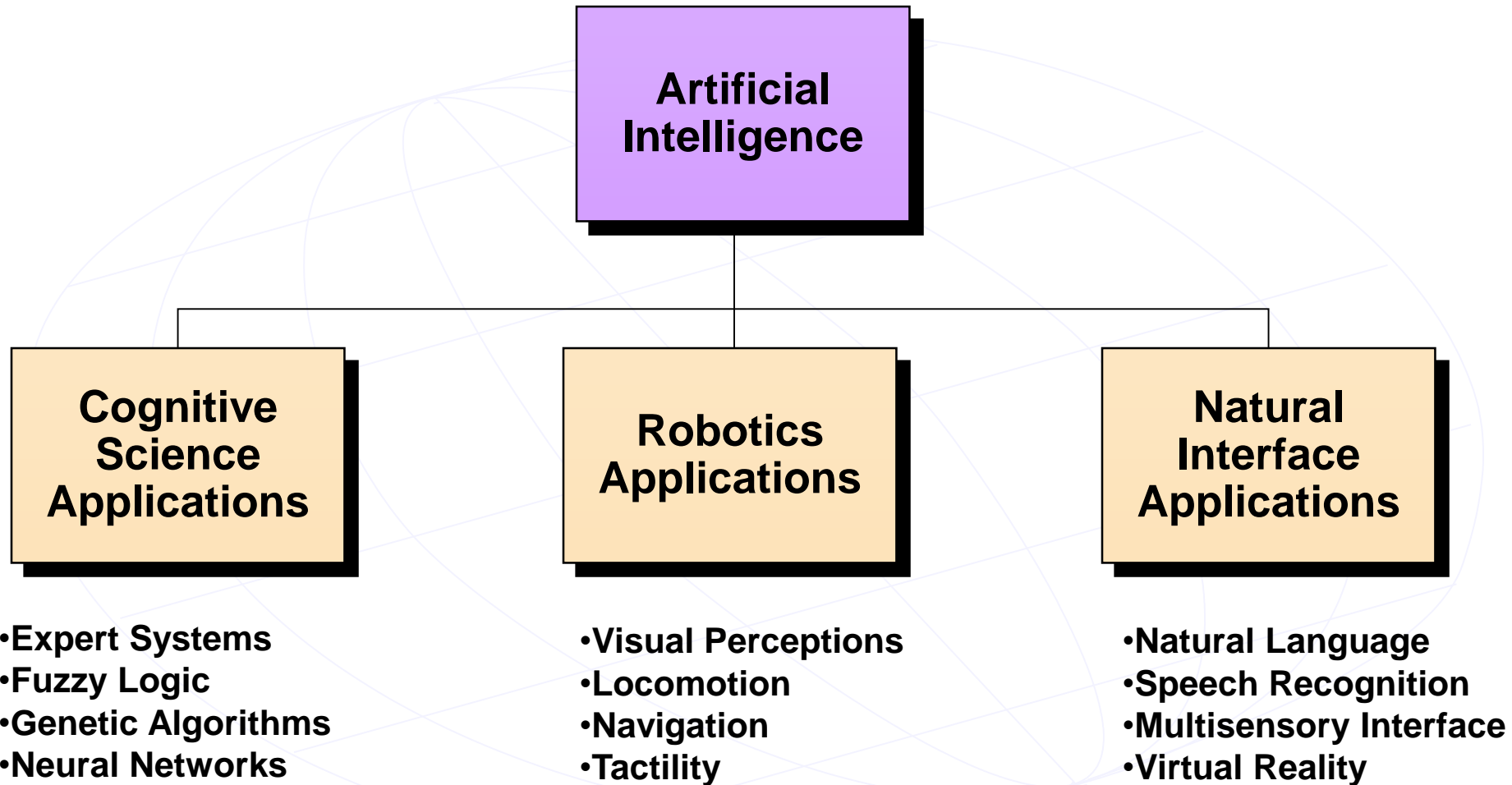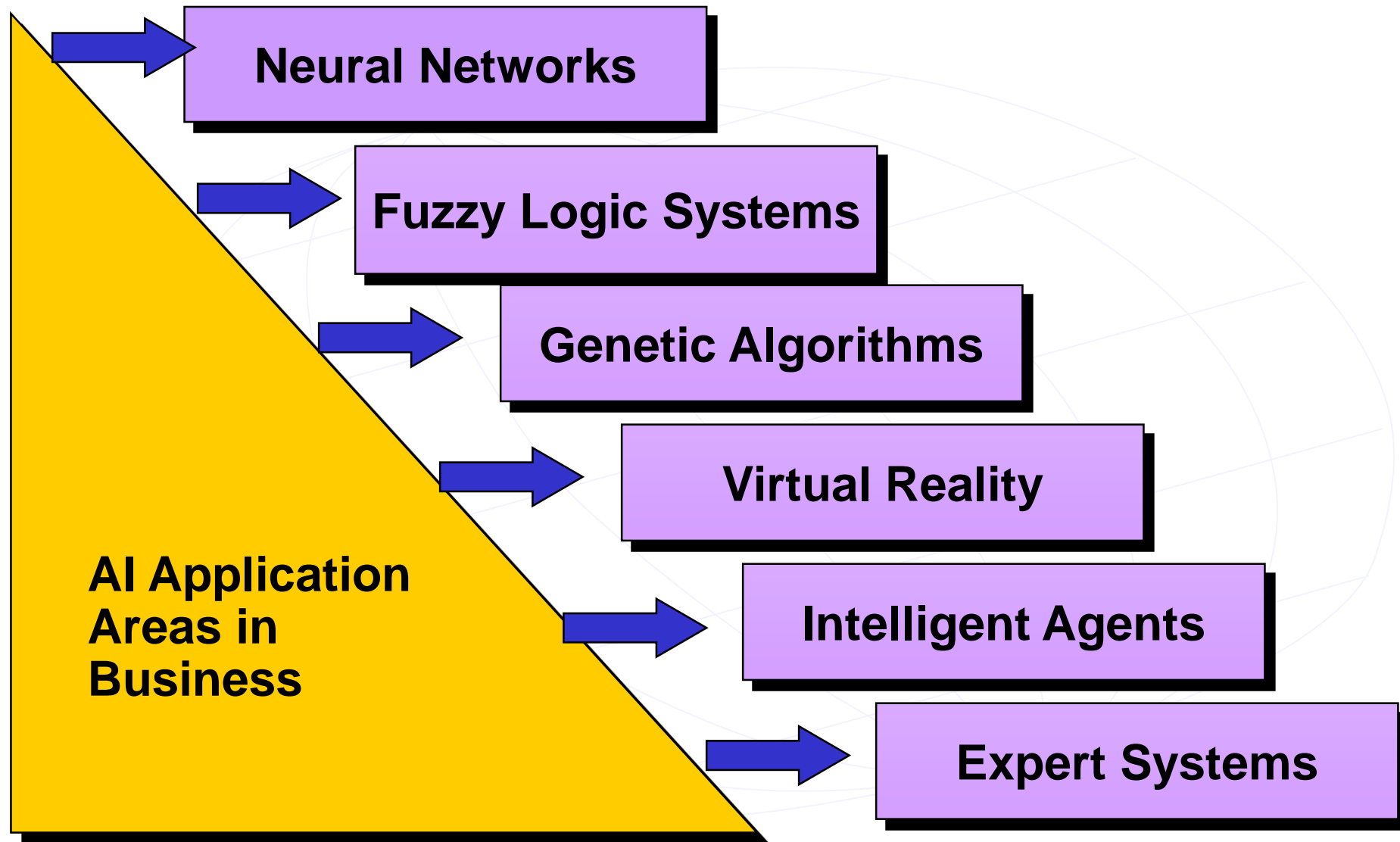
Attributes of Intelligent Behavior

- Think and reason
- Use reason to solve problems
- Learn or understand from experience
- Acquire and apply knowledge
- Exhibit creativity and imagination
- Deal with complex or perplexing situations
- Respond quickly and successfully to new situations.
- Recognize the relative importance of elements in a situation
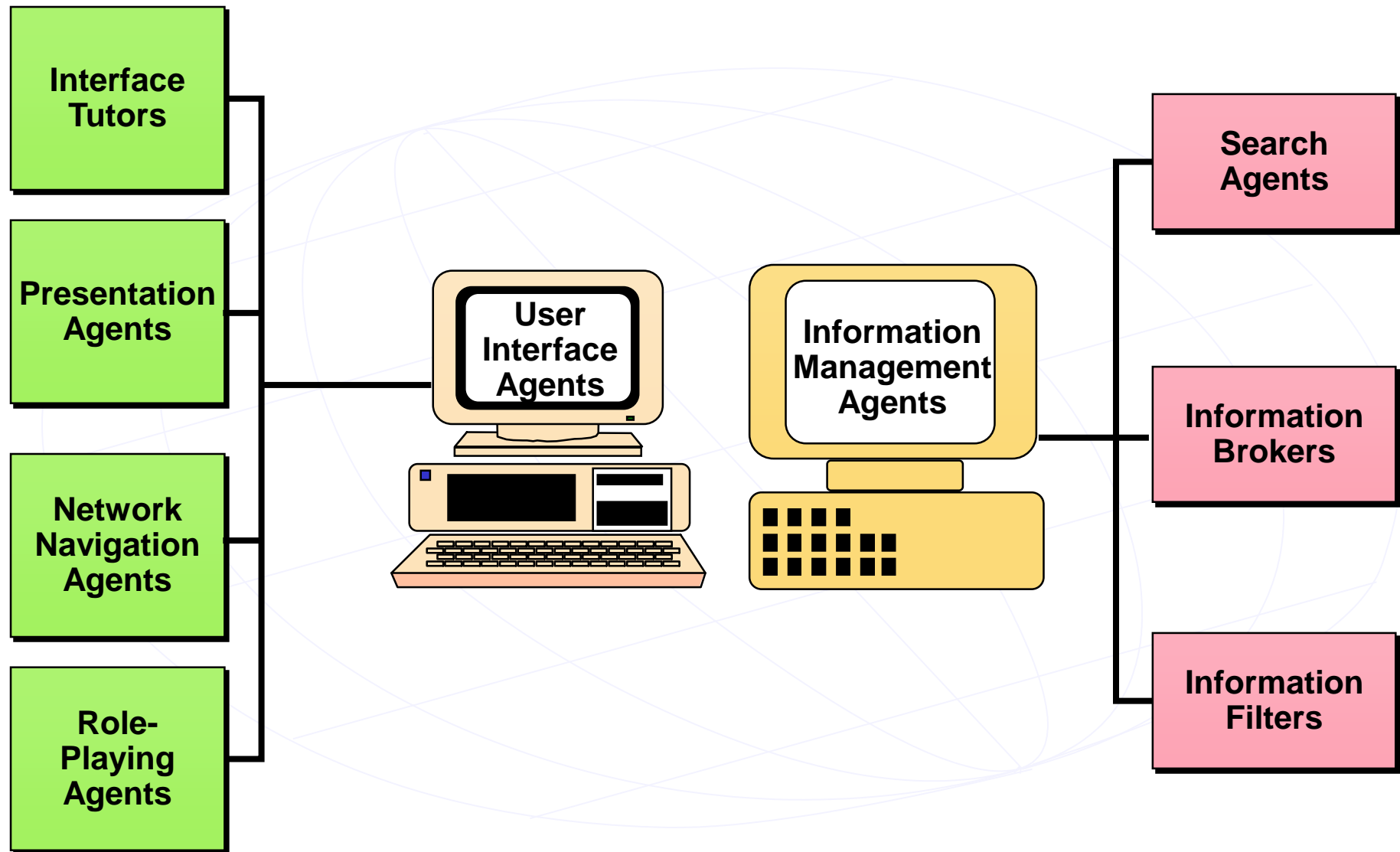- Handle ambiguous, incomplete,or erroneous information
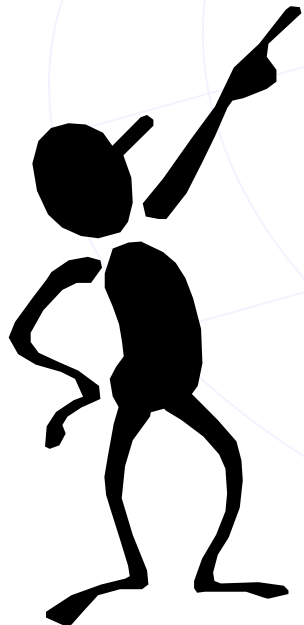
Artificial Intelligence Applications

Artificial Intelligence

Cognitive Science Applications

Robotics Applications

Natural Interface Applications

- Expert Systems
- Fuzzy Logic
- Genetic Algorithms
- Neural Networks

- Visual Perceptions
- Locomotion
- Navigation
- Tactility

- Natural Language
- Speech Recognition
- Multisensory Interface
- Virtual Reality

AI Application Areas in Business

AI Application Areas in Business

→ **Neural Networks**

→ **Fuzzy Logic Systems**

→ **Genetic Algorithms**

→ **Virtual Reality**

→ **Intelligent Agents**

→ **Expert Systems**

Intelligent Agents

Components of Expert Systems

The Expert System

Expert Advice

User — **Workstation**

User Interface Programs — **Inference Engine Program** — **Knowledge Base**

Expert System Development

Knowledge Acquisition Program

Knowledge Engineering

Workstation

Expert and/or Knowledge Engineer
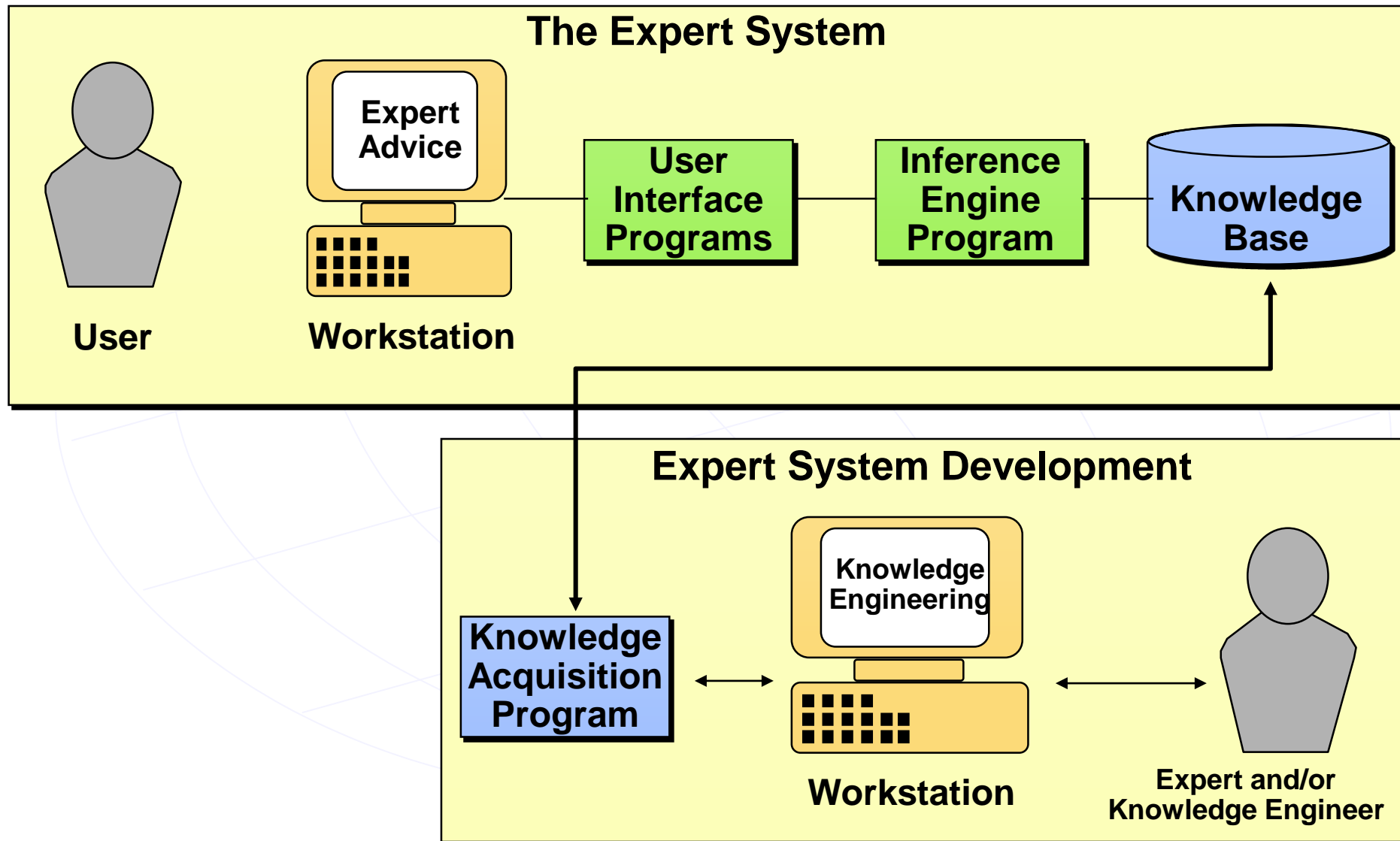
Expert System Applications

**Major
Application
Categories
of Expert Systems**

Decision Management

Diagnostic/Troubleshooting

Maintenance/Scheduling

Design/Configuration

Selection/Classification

Process Monitoring/Control
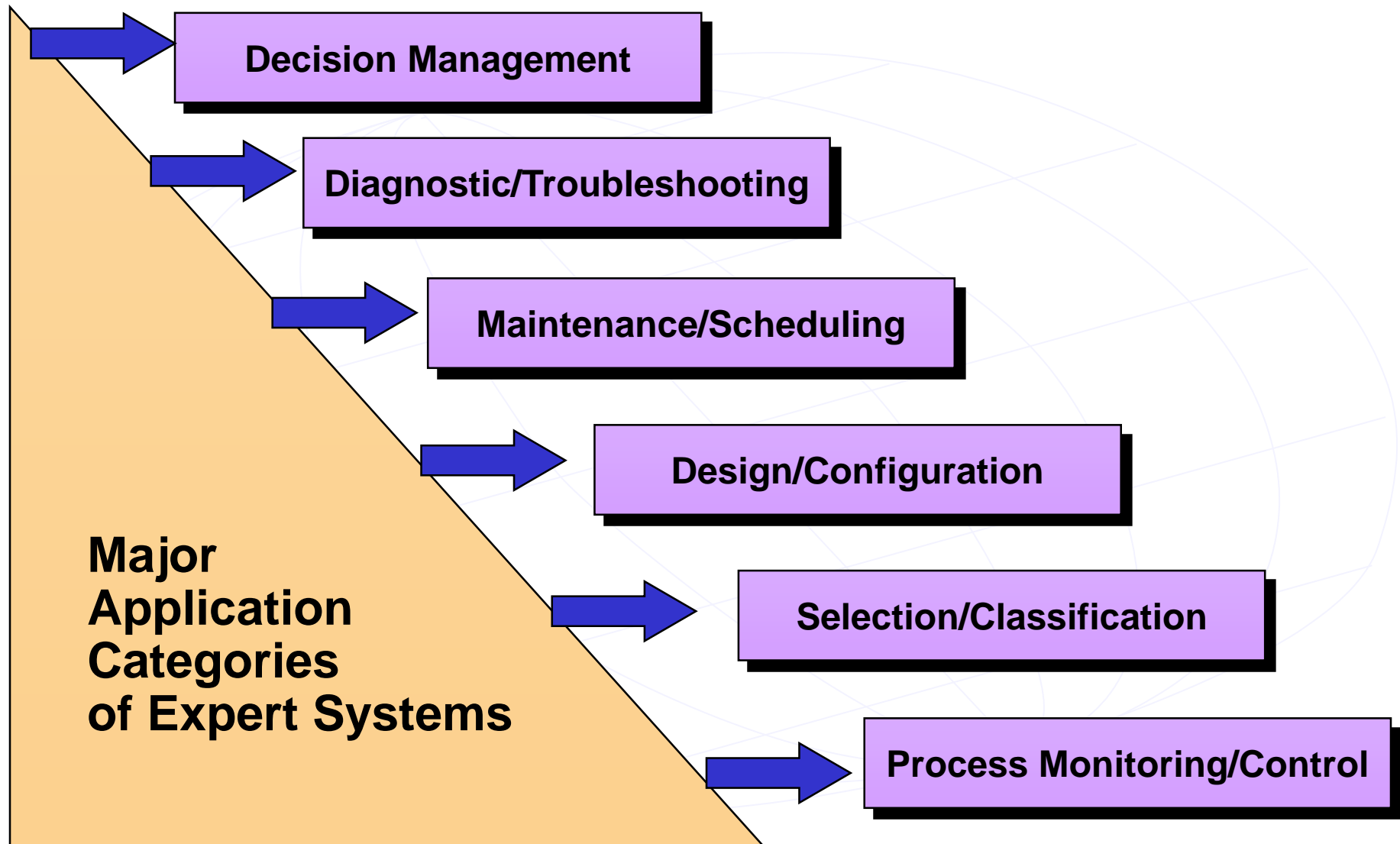
Chapter Summary

- **Decision support systems in business are changing. The growth of corporate intranets, extranets, and other web technologies have increased the demand for a variety of personalized, proactive, web-enabled analytical techniques to support DSS.**

- **Information systems must support a variety of management decision-making levels and decisions. These include the three levels of management activity: strategic, tactical, and operational.**

Chapter Summary (cont)

- Online analytical processing is used to analyze complex relationships among large amounts of data stored in multidimensional databases. Data mining analyzes large stores of historical data contained in data warehouses.

- Decision support systems are interactive computer-based information systems that use DSS software and a model base to provide information to support semi-structured and unstructured decision making.

Chapter Summary (cont)

- **The major application domains in artificial intelligence include a variety of applications in cognitive sciences, robotics, and natural interfaces.**

- **Major AI application areas include:**
  - Neural Networks
  - Fuzzy Logic
  - Genetic Algorithms
  - Virtual Reality
  - Intelligent Agents