KEY SYSTEMS APPLICATIONS

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Learning Goals

Students will be able to:

- Describe and analyze IT in the context of society and organizations

- Propose, select, choose and build solutions of IT infrastructure and **IT applications**

- Reflect and evaluate IT management and development

Index

1. Enterprise Applications

2. E-commerce

3. Managing Knowledge and Artificial Intelligence

4. Enhancing Decision Making

Enterprise Applications

ERP Evolution

1960s
- Inventory Control Packages

1970s
- Material Resource Planning (MRP)

1980s
- Manufacturing Resource Planning (MRP II)

1990s
- Enterprise Resource Planning (ERP)

2000s
- ERP II (Internet-enabled), Cloud ERP

2010s
- ERP processes data in real-time, machine learning, IoT

ERP: Big International Players
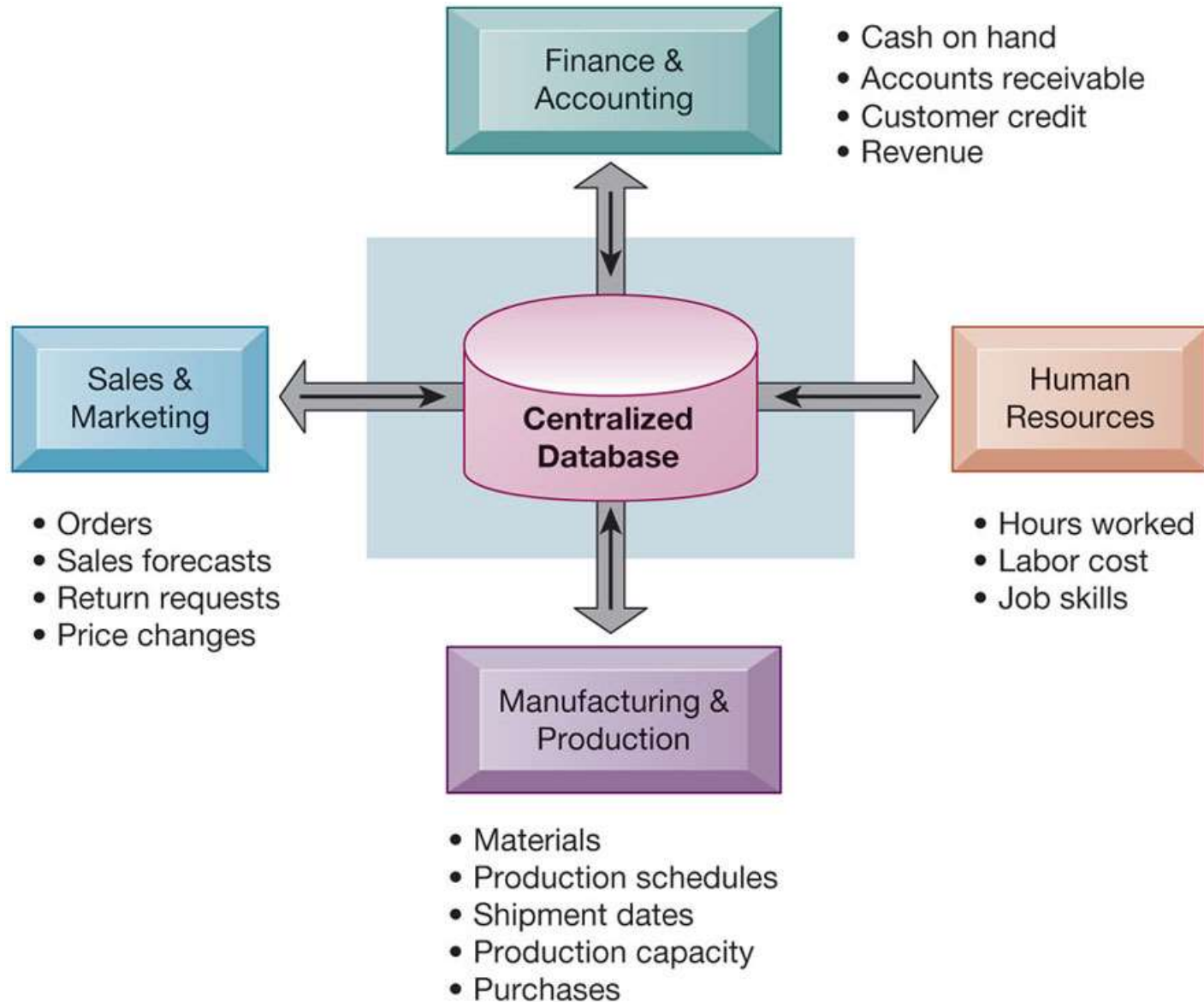
ERP: Portuguese Players

ERP Open Source

Enterprise systems

Finance & Accounting
- Cash on hand
- Accounts receivable
- Customer credit
- Revenue

Centralized Database

Sales & Marketing
- Orders
- Sales forecasts
- Return requests
- Price changes

Human Resources
- Hours worked
- Labor cost
- Job skills

Manufacturing & Production
- Materials
- Production schedules
- Shipment dates
- Production capacity
- Purchases
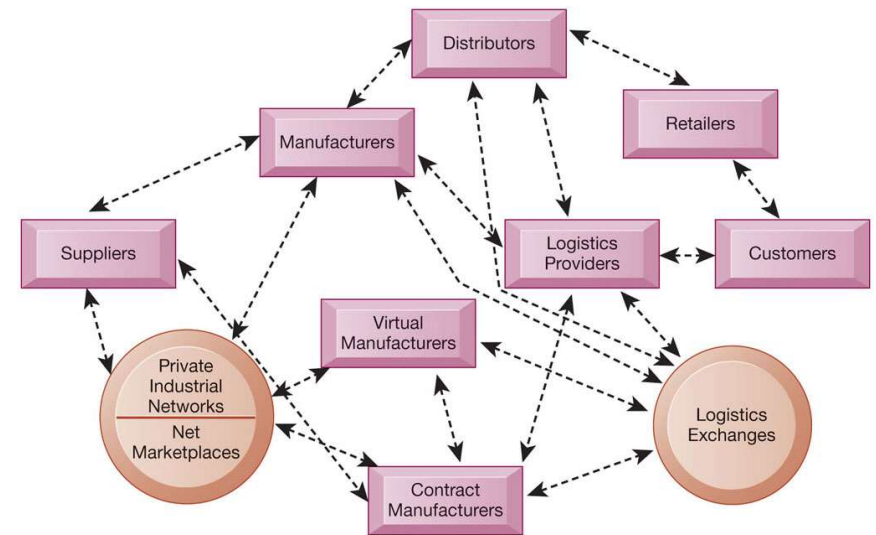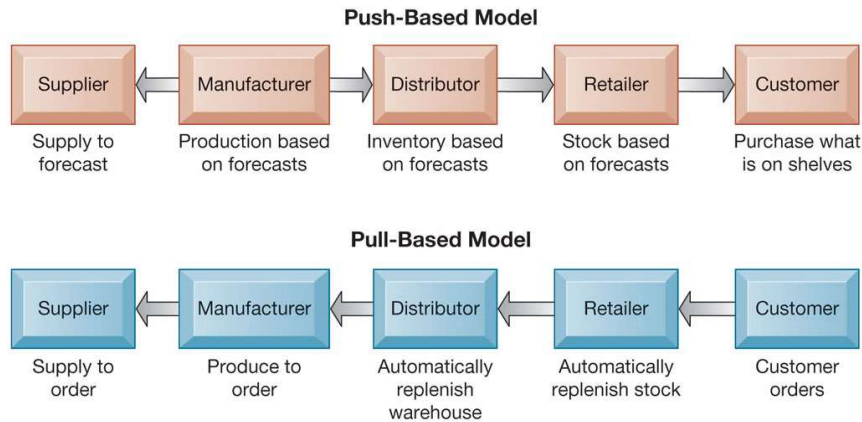
Supply chain management systems

- Supply chain planning systems
  - Model existing supply chain
  - Enable demand planning
  - Optimize sourcing, manufacturing plans
  - Establish inventory levels
  - Identify transportation modes
- Supply chain execution systems
  - Manage flow of products through distribution centers and warehouses

How do supply chain management systems coordinate planning, production, and logistics with suppliers?

Push-Based Model

Supplier	Manufacturer	Distributor	Retailer	Customer
Supply to forecast	Production based on forecasts	Inventory based on forecasts	Stock based on forecasts	Purchase what is on shelves

Pull-Based Model

Supplier	Manufacturer	Distributor	Retailer	Customer
Supply to order	Produce to order	Automatically replenish warehouse	Automatically replenish stock	Customer orders

Distributors
Manufacturers
Retailers
Suppliers
Logistics Providers
Customers
Virtual Manufacturers
Private Industrial Networks Net Marketplaces
Contract Manufacturers
Logistics Exchanges

- Match supply to demand
- Reduce inventory levels
- Improve delivery service
- Speed product time to market
- Use assets more effectively
  - Total supply chain costs can be 75 percent of operating budget
- Increase sales

Challenges

Customer Relationship Management (CRM)

CRM Delivery Processes (1)

- Campaign Management

  - To generate leads or potential clients

- Sales Management

  - To convert lead into potential clients

- Service Management

  - Provide ongoing support for the client and assist in the operation of product or services

- Complaint Management

  - To improve customer satisfaction

CRM Delivery Processes (2)

- Market Research
  - Focuses on systematic design, collection, analysis and reporting of data relative to sales activity

- Loyalty Management
  - Provides the processes to optimize the duration and intensity of relationships with customers

- Customer Profiling
  - Marketing profile of every customer

- Feedback Management
  - Gather, analyze and share customer information

Analytical CRM
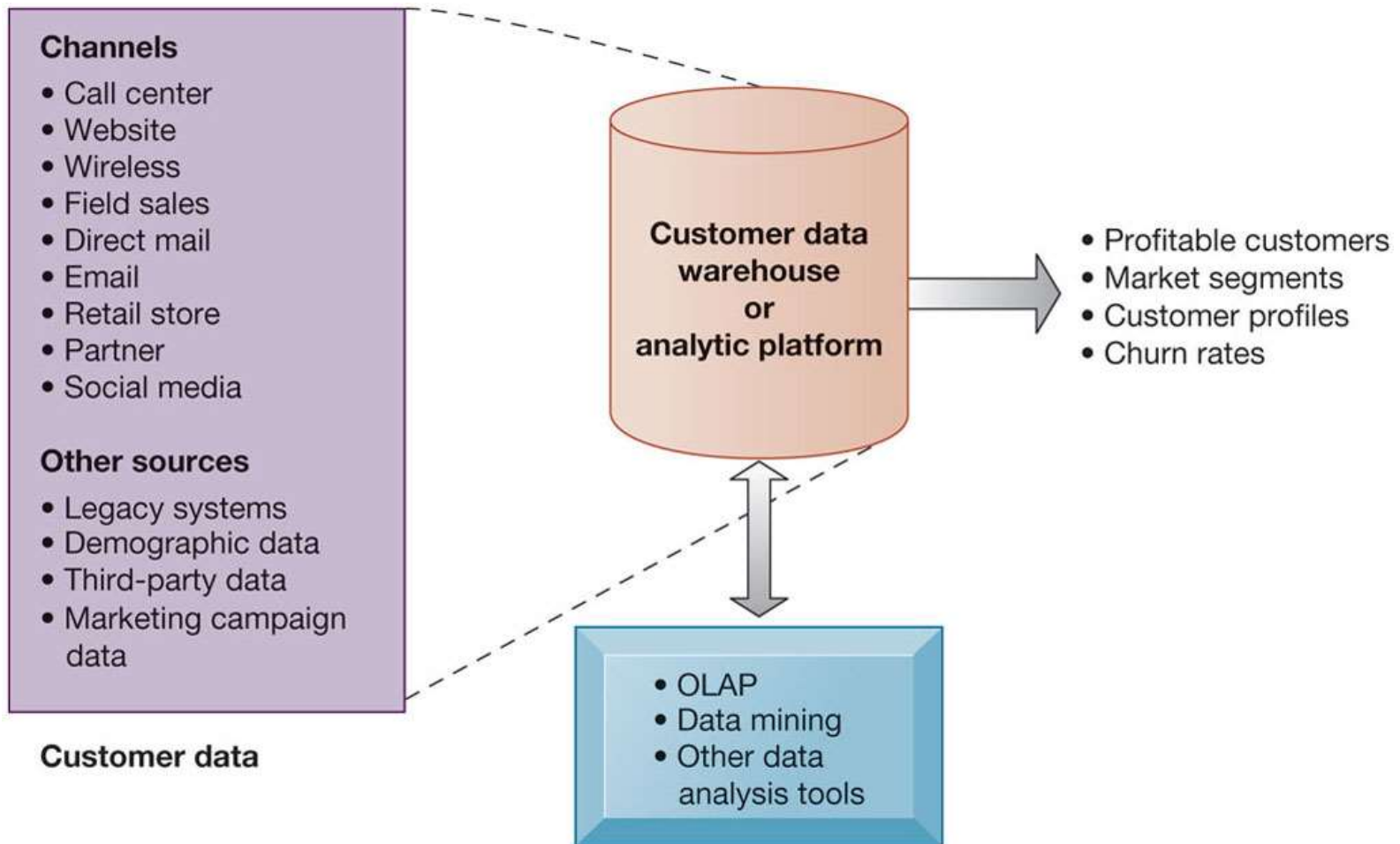
CRM Software

Source: Gartner (June 2021)

Enterprise applications Challenges

- Expensive to purchase and implement enterprise applications
    - Multi-million-dollar projects in 2018
    - Long development times
- Technology changes
- Business process changes
- Organizational learning, changes
- Switching costs, dependence on software vendors
- Data standardization, management, cleansing

E-commerce

Features of e-commerce

- Internet and digital markets have changed the way companies conduct business
- Information asymmetry reduced
- Menu costs, search and transaction costs reduced
- Dynamic pricing enabled
- Switching costs
- Delayed gratification
- Disintermediation

E-commerce business and revenue models

- Portal
- E-tailer
- Content provider
- Transaction broker
- Market creator
- Service provider
- Community provider

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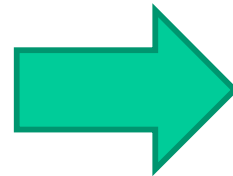
Advertising
Sales
Subscription
Free/Freemium
Transaction fee
Affiliate

M-commerce

- M-commerce in 2017 is 35 percent of all e-commerce
- Fastest growing form of e-commerce
  - Growing at 20 percent or more per year
- Main areas of growth
  - Mass market retailing (Amazon, eBay, etc.)
  - Sales of digital content (music, T V, etc.)
 - In-app sales to mobile devices

How has e-commerce transformed marketing?

- Internet provides new ways to identify and communicate with customers
- Long tail marketing
- Internet advertising formats
- Behavioral targeting
    - Tracking online behavior of individuals
- Social commerce

How has e-commerce affected business-to-business transactions?

- U.S. B2B trade in 2020 was $14.5 trillion

  - U.S. B2B e-commerce in 2019 is $6.7 trillion

- Internet and networking helps automate procurement

- Variety of Internet-enabled technologies used in B2B

  - Electronic data interchange (EDI)

  - Private industrial networks (private exchanges)

  - Net marketplaces

  - Exchanges
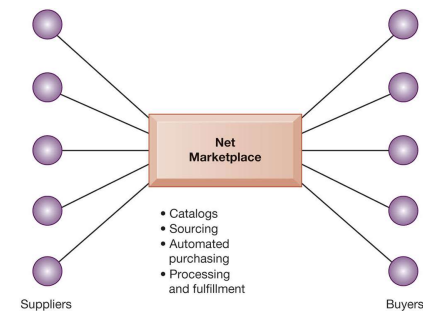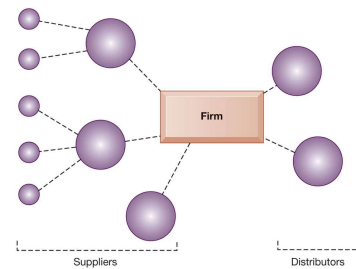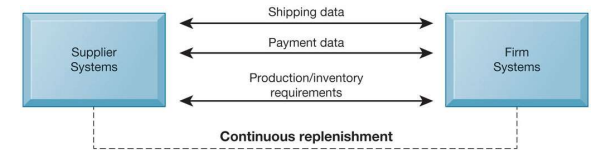
What issues must be addressed when building an e-commerce presence?
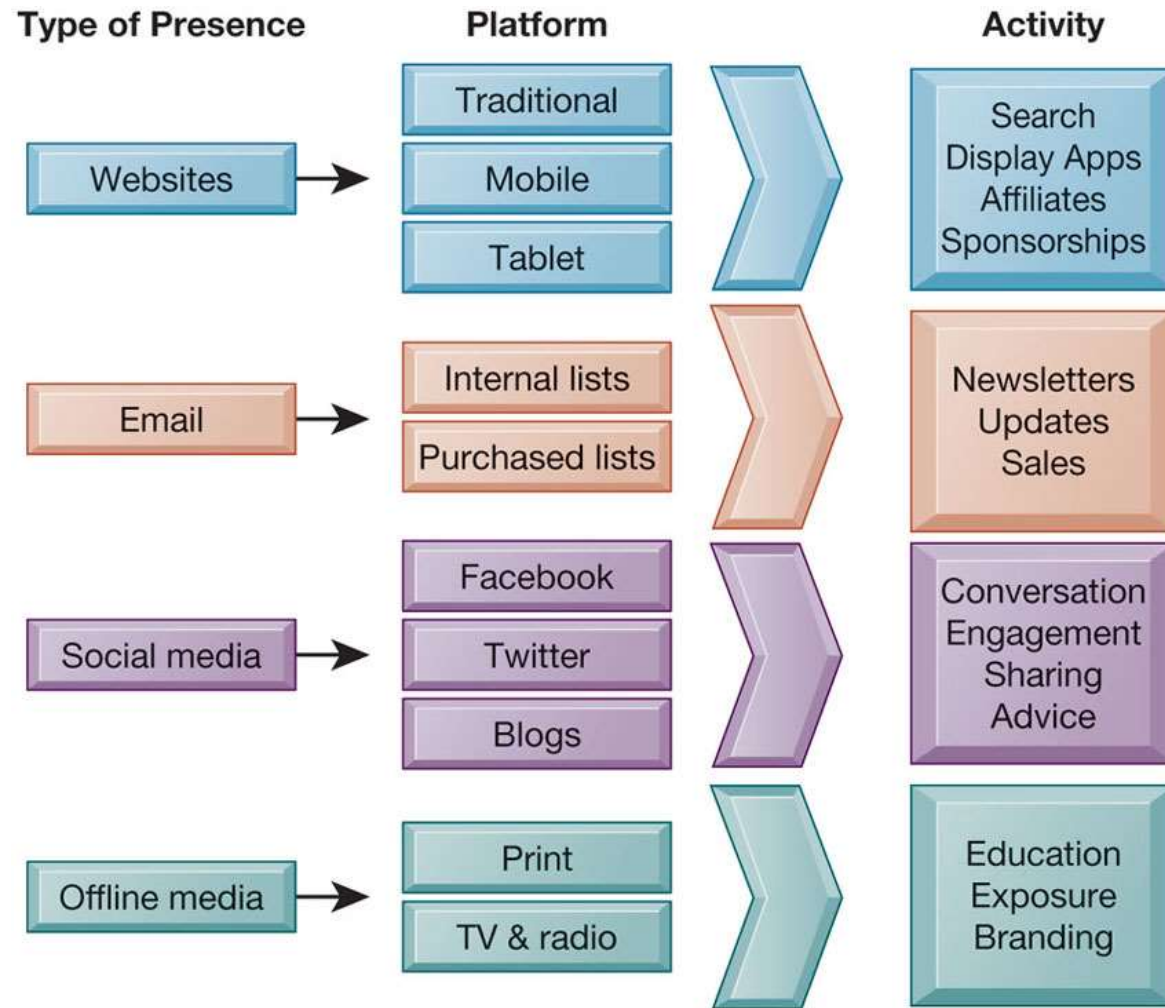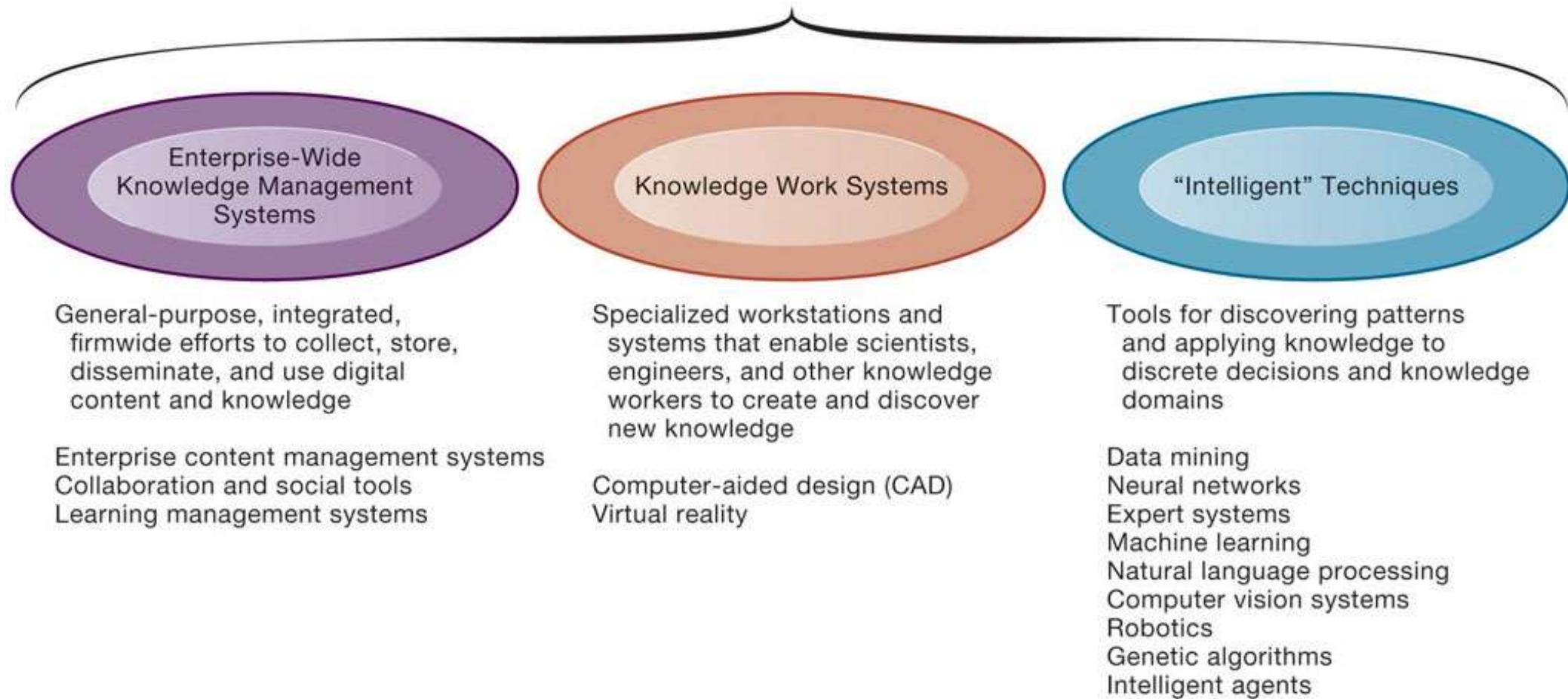
Managing Knowledge and Artificial Intelligence
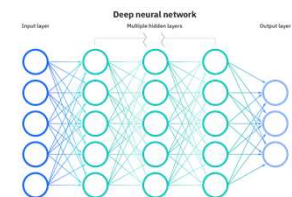
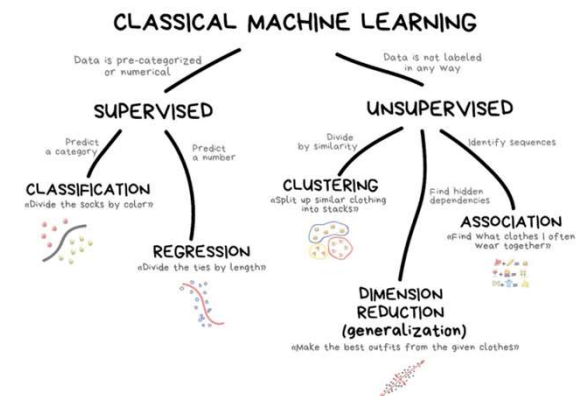# Knowledge Management Systems

- Knowledge management systems among fastest growing areas of software investment
- Information economy
  - 37 percent U.S. labor force: knowledge and information workers
  - 55 percent U.S. GDP from knowledge and information sectors
- Substantial part of a firm's stock market value is related to intangible assets: knowledge, brands, reputations, and unique business processes
- Well-executed knowledge-based projects can produce extraordinary ROI

Types of Knowledge Management Systems

Enterprise-Wide Knowledge Management Systems

General-purpose, integrated, firmwide efforts to collect, store, disseminate, and use digital content and knowledge

Enterprise content management systems
Collaboration and social tools
Learning management systems

Knowledge Work Systems

Specialized workstations and systems that enable scientists, engineers, and other knowledge workers to create and discover new knowledge

Computer-aided design (CAD)
Virtual reality

"Intelligent" Techniques

Tools for discovering patterns and applying knowledge to discrete decisions and knowledge domains

Data mining
Neural networks
Expert systems
Machine learning
Natural language processing
Computer vision systems
Robotics
Genetic algorithms
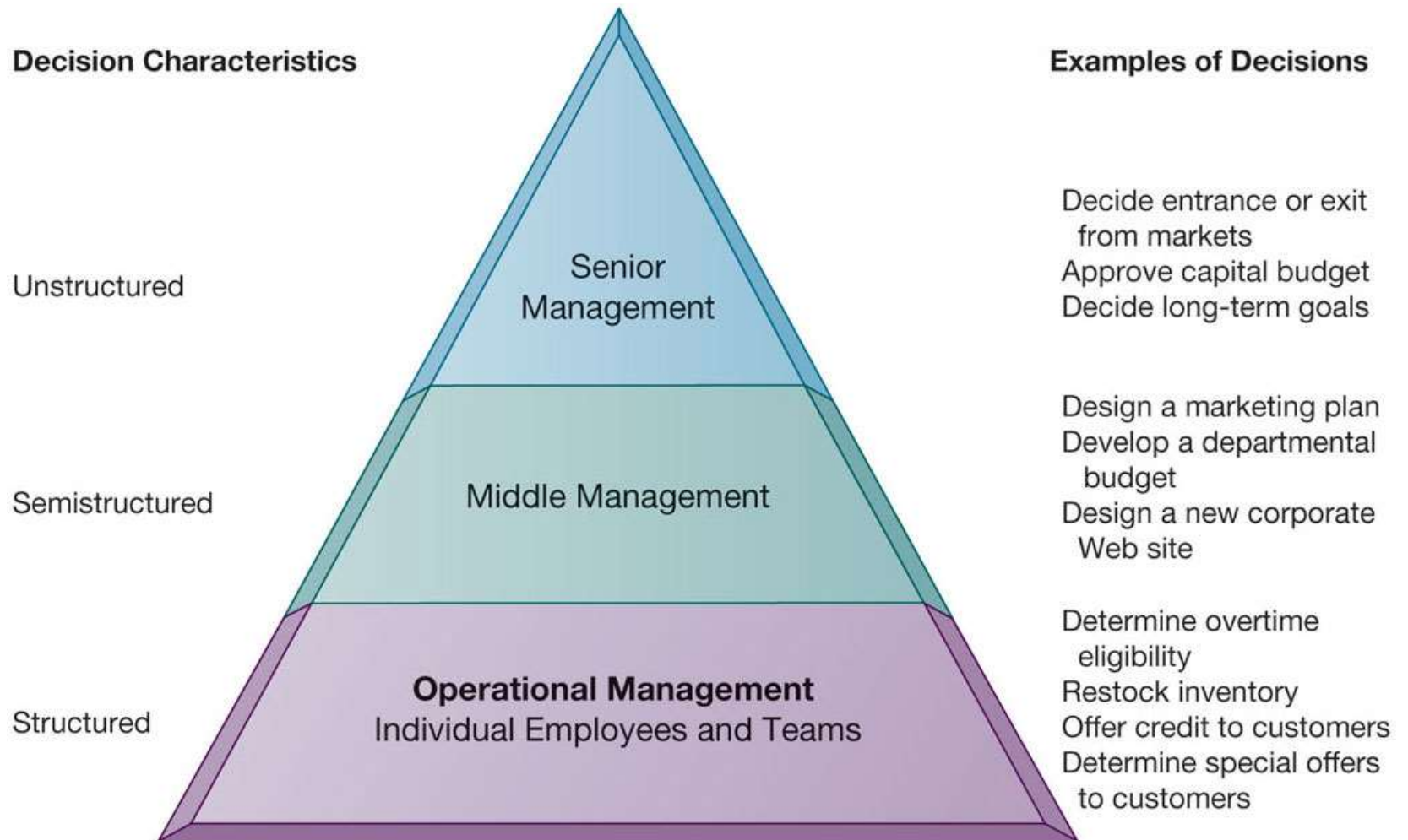Intelligent agents

Artificial Intelligence: its different types

- Artificial intelligence
  - refers to the development of computer-based solutions
  - can perform tasks which mimic human intelligence.
- Expert Systems
- Automation
- Machine Learning
- Neural Network and Deep Learning
- Genetic Algorithm
- Computer Vision
- Natural Language Processing
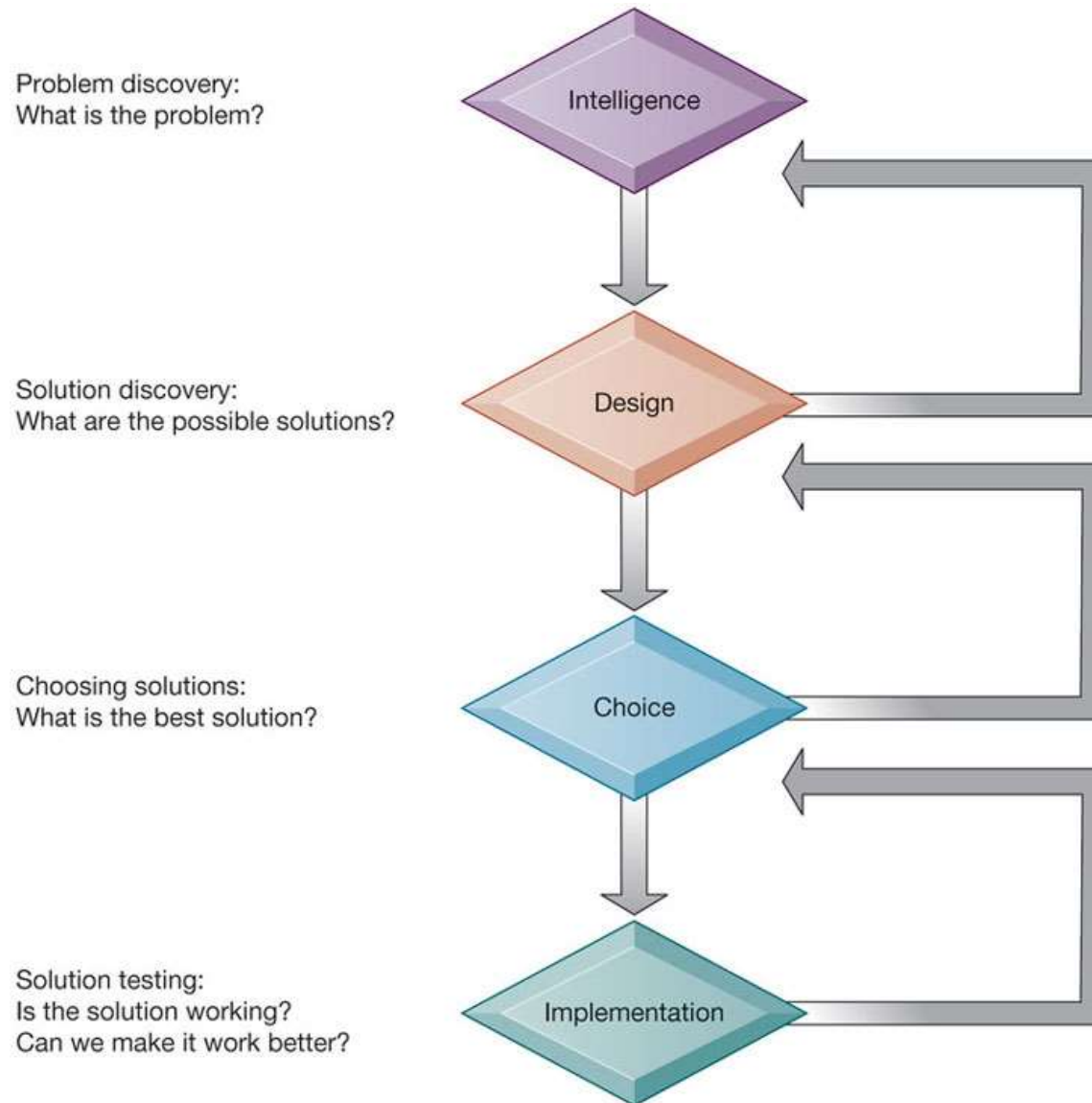- Robotics
- Intelligent Agents

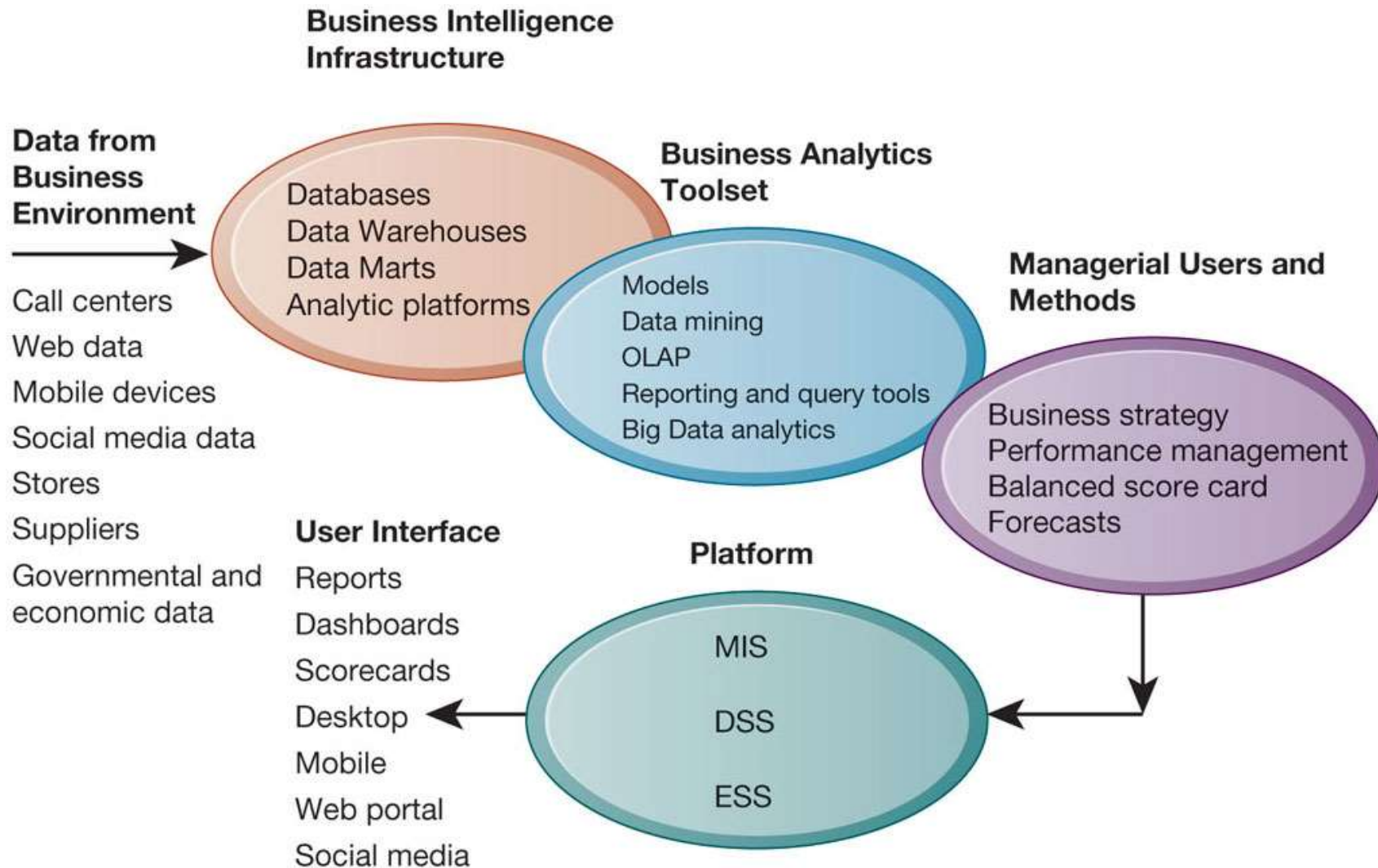# Enhancing Decision Making

Types of Decisions

Decision Characteristics

Unstructured

Semistructured

Structured

Senior Management

Middle Management

Operational Management
Individual Employees and Teams

Examples of Decisions

Decide entrance or exit from markets
Approve capital budget
Decide long-term goals

Design a marketing plan
Develop a departmental budget
Design a new corporate Web site

Determine overtime eligibility
Restock inventory
Offer credit to customers
Determine special offers to customers

The Decision-Making Process

information systems & decision making

Three main reasons why investments in IT do not always produce positive results

- Information quality
  - High-quality decisions require high-quality information
- Management filters
  - Managers have selective attention and have variety of biases that reject information that does not conform to prior conceptions
- Organizational inertia and politics
  - Strong forces within organizations resist making decisions calling for major change

BI and BA and Decision Making

Enhancing Decision Making

Power Users:
Producers
(20% of employees)

IT developers

Super users

Business analysts

Analytical modelers

Capabilities

Production Reports

Parameterized Reports

Dashboards/Scorecards

Ad hoc queries; Drill down
Search/OLAP

Forecasts; What if
Analysis; statistical models

Casual Users:
Consumers
(80% of employees)

Customers/suppliers
Operational employees

Senior managers

Managers/Staff

Business analysis

Power BI

Next Session

- IT in Business and Society
- IT Infrastructure
- Key Systems Applications
- **Build and Manage Systems**