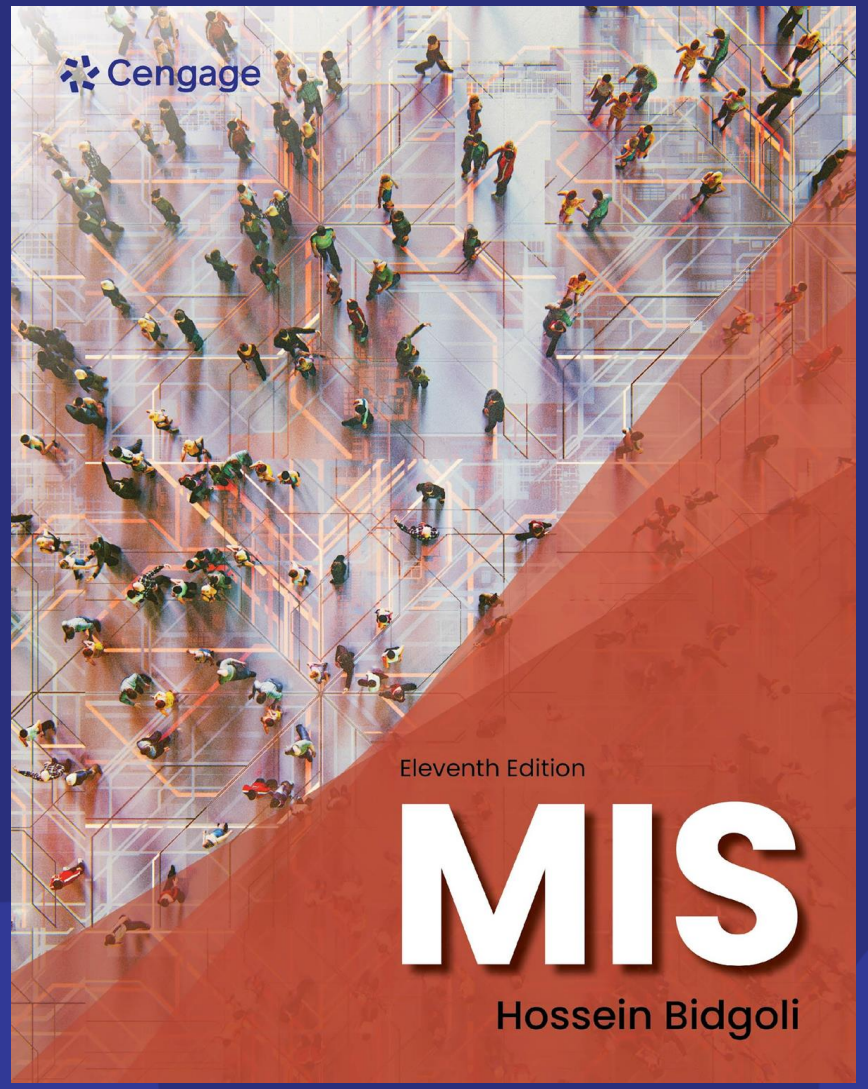


MIS, 11e

Module 1: Information Systems in Business

Module Objectives

By the end of this module, you should be able to:

1.1 Discuss common applications of computers and information systems.

1.2 Explain the differences between computer literacy and information literacy.

1.3 Define transaction-processing systems.

1.4 Define management information systems.

1.5 Describe the four major components of an information system.

1.6 Define strategic information systems.

1.7 Discuss the differences between data and information.

1.8 Explain the importance and applications of information systems in functional areas of a business.

1.9 Analyze how information technologies are used to gain a competitive advantage.

1.10 Apply the Five Forces Model and strategies for gaining a competitive advantage.

1.11 Review the IT job market.

1.12 Summarize the future outlook of information systems.

Computers and Information Systems in Daily Life

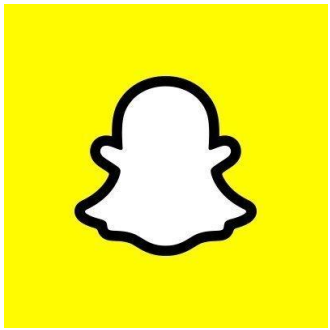
Common uses in daily life:

- Online classes
- Grocery and retail stores
- Banking services
- Telecommute
- Smartphones
- Tablets
- Social networking
- Search engines
- Video-sharing

Question:

What is your preferred set of information systems that you like to use?

Video-Sharing IS



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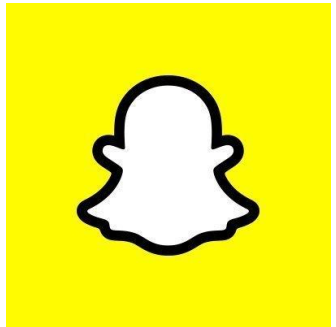
Question:

What are your favorite channels that you like to watch on Youtube?

Instant Messaging IS



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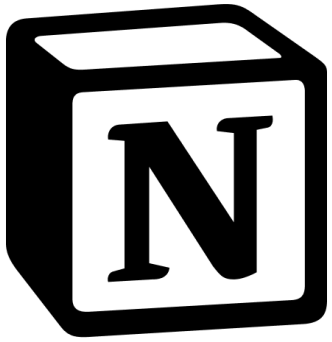
Project Management IS



Learning Management IS

Enterprise Resource Planning IS

Computer Literacy and Information Literacy

Computer Literacy - a skill in using productivity software

- Word processors, spreadsheets, database management, presentation software, as well as having a basic knowledge of hardware and software, the Internet and the collaboration tools and technologies

Information Literacy – understanding the role of information in generating and using business intelligence

- historical, current, and predictive views of business operations and environments
- gives organizations a competitive advantage in the marketplace

Types of Information Systems

1. Transaction-Processing Systems
2. Management Information Systems
3. Strategic Information Systems

Transaction-Processing Systems

Transaction-processing systems (TPSs)

These systems are designed to process and track day-to-day transactions of an organization, such as sales, payments, and reservations.

- Focus on data collection and processing
- Used for cost reduction
- Applied to structured tasks (e.g., record keeping, simple clerical operations, and inventory control)
- Require minimal human involvement when automated

Transaction-Processing Systems Examples

1. Point of Sale (POS) Systems
2. Automated Teller Machines (ATMs)
3. Online Payment Processing Systems, like Stripe, Square, Paypal, Apple Pay, Google Pay, Alipay and etc.
4. Payroll and Accounting Systems, like Quickbook
5. Hotel reservation systems
6. ...

A good article on TPS:

https://www.indeed.com/career-advice/career-development/what-is-transaction-processing-system

Management Information Systems

Management information system (MIS)

- Organized integration of hardware and software technologies, data, processes, and human elements
- Designed to produce timely, integrated, relevant, accurate, and useful information for decision-making

Tasks in an MIS

1. Define the system's objectives
2. Collect and analyze data
3. Provide information in a useful format

Management Information Systems

MIS applications

- Used in both private and public sectors

MIS Examples

- Inventory Management system
- Customer Relationship Management system
- Sale Management system
- …

Good articles and videos to help you understand TPS and MIS:

- https://www.guru99.com/mis-types-information-system.html
- https://www.wallstreetmojo.com/management-information-system/
- https://www.youtube.com/watch?v=nQ4Q3iN7TMM&t=1s

Major Components of an Information System

In addition to

- Hardware
- Software
- People

An IS includes four major components:

Major Components of an Information System (1 of 4)

Exhibit 1.3 - Major Components of an Information System

Data – the input to the system

Source of data:

- External: Customers, competitors, and suppliers, Government agencies, financial institutions, labor and population statistics, economic conditions …
- Internal: sales records, personnel records, …

Major Components of an Information System (2 of 4)

Database – collection of all relevant data organized in a series of integrated files

Database Management Systems:

- Microsoft Access
- Oracle
- Microsoft SQL
- MySQL
- PostgreSQL
- MongoDB
- …

Major Components of an Information System (3 of 4)

Process – to generate the most useful type of information for making decisions

Examples:

- Transaction-processing reports
- Models for decision analysis

Major Components of an Information System (4 of 4)

Information – the output of an information system

Qualities of Useful Information:

- Timeliness
- Integration with other data and information
- Consistency and accuracy
- Relevance
- **comprehensible**

Major Components of an Information System

Example #1 of Information Systems:

- A state university stores all historical and current student data in a database.

Student Data Collected:

- First name
- Last name
- Age
- Gender
- Major
- Nationality

What Useful Information can we get from the data?

Major Components of an Information System

Useful Information:

- How many students are in each major?
- Which major is the fastest growing?
- What is the average age of the student body?
- Among the international students, which country is home to the highest number of students?
- What is the ratio of gender identities in each major?
- Generate the estimated number of students for new year.
- Knowing which major is the fastest growing.

Major Components of an Information System

Example #2 of Information Systems:

- Textile company stores data on products, suppliers, costs, etc.

Data Collected on:

- Products
- Suppliers
- Sales personnel
- Costs

What Useful Information can we get from the data?

Major Components of an Information System

Useful Information:

- Which salesperson generated the highest sales?
- Which product generated the highest sales? The lowest sales?
- Generate predictions for the next sales period.
- Decide to allocate advertising budget to different products.

Strategic Information Systems

Focuses on:

- Big-picture
- Long-term goals and objectives
- Assists in implementing strategies

Key Characteristics:

- Goal-oriented
- Involves top management
- Multidisciplinary
- Future-oriented
- Dynamic

Using Information Systems and Information Technologies

Information technologies

- The Internet
- Computer networks
  - Wired
  - Wireless
- Database systems
- Point-of-sale (POS) systems
- Radio-frequency-identification (RFID) tags

The Importance of Information Systems (1 of 6)

- The 2nd most important resource in any organization.

- Timely, relevant, and accurate information is a critical tool that
  - Enhances a company's competitive position
  - Manages the four Ms of resources
    - Manpower
    - Machinery
    - Materials
    - Money

The Importance of Information Systems (2 of 6)

Personnel information system (PIS) or human resource information system (HRIS)

- Provide information for personnel to do tasks effectively

Decision-making examples:

- Choosing the best job candidate
- Scheduling and assigning employees
- Predicting future personnel needs
- Provide reports and statistics on employee demographics
- Allocating human and financial resources

The Importance of Information Systems (3 of 6)

Logistics information system (LIS)

- Reduce the cost of transporting materials
- Maintain safe and reliable delivery

Decision-making examples:

- Improve routing and delivery schedules
- Select the best modes of transportation
- Improve transportation budgeting
- Improve shipment planning

The Importance of Information Systems (4 of 6)

Manufacturing information system (MFIS)

- Manage manufacturing resources
- Reduce manufacturing costs
- Increase product quality
- Improve inventory decisions

Decision-making examples:

- Ordering decisions
- Product cost calculations
- Space utilization
- Bid evaluation process used with vendors and suppliers
- Analysis of price changes and discounts

The Importance of Information Systems (5 of 6)

Financial information system (FIS)

- Provide information to financial executives

Decision-making examples:

- Improve budget allocation
- Minimize capital investment risks
- Monitor cost trends
- Manage cash flows
- Determine portfolio structures

The Importance of Information Systems (6 of 6)

Marketing information system (MKIS)

- Improve marketing decisions
- Provides timely, accurate, and integrated information about the marketing mix
- 4Ps: Price, Promotion, Place, and Product

Decision-making examples:

- Analyze market share, sales, and sales personnel
- Sales forecasting
- Price and cost analysis of items sold

Using IT for a Competitive Advantage (1 of 4)

Porter's Three strategies for successfully competing in the marketplace:

- Overall cost leadership
- Differentiation
- Focus

Using IT for a Competitive Advantage (2 of 4)

Overall cost leadership strategy

- Bottom-line strategy - improve efficiency by reducing costs.
- Top-line strategy - generate new revenue by offering new products and services
- Example use-case: Walmart (check out the information box in Page 17)

Imagine you are in charge of Walmart, with competitors like Amazon out there, what can you do?

- Check out this video: https://www.youtube.com/watch?v=vAL2YtZRiIY

Using IT for a Competitive Advantage (3 of 4)

Differentiation strategy

- Make products and services different from competitors
- Examples:
  - Apple – Different looking computers and ease of use
  - Amazon – Personalization and recommendations
  - Any other examples? Let's discuss!

Using IT for a Competitive Advantage (4 of 4)

Focus strategy

- Concentrate on a specific market segment
- Examples:
  - Apple
    - Target iPhone to consumers rather than businesses
    - Macintosh computers marketed to creative professionals
  - Abercrombie & Fitch
    - Targets high-end clothing to low-income customers
  - Nordstrom
    - Targets high-end clothing to high-income customers

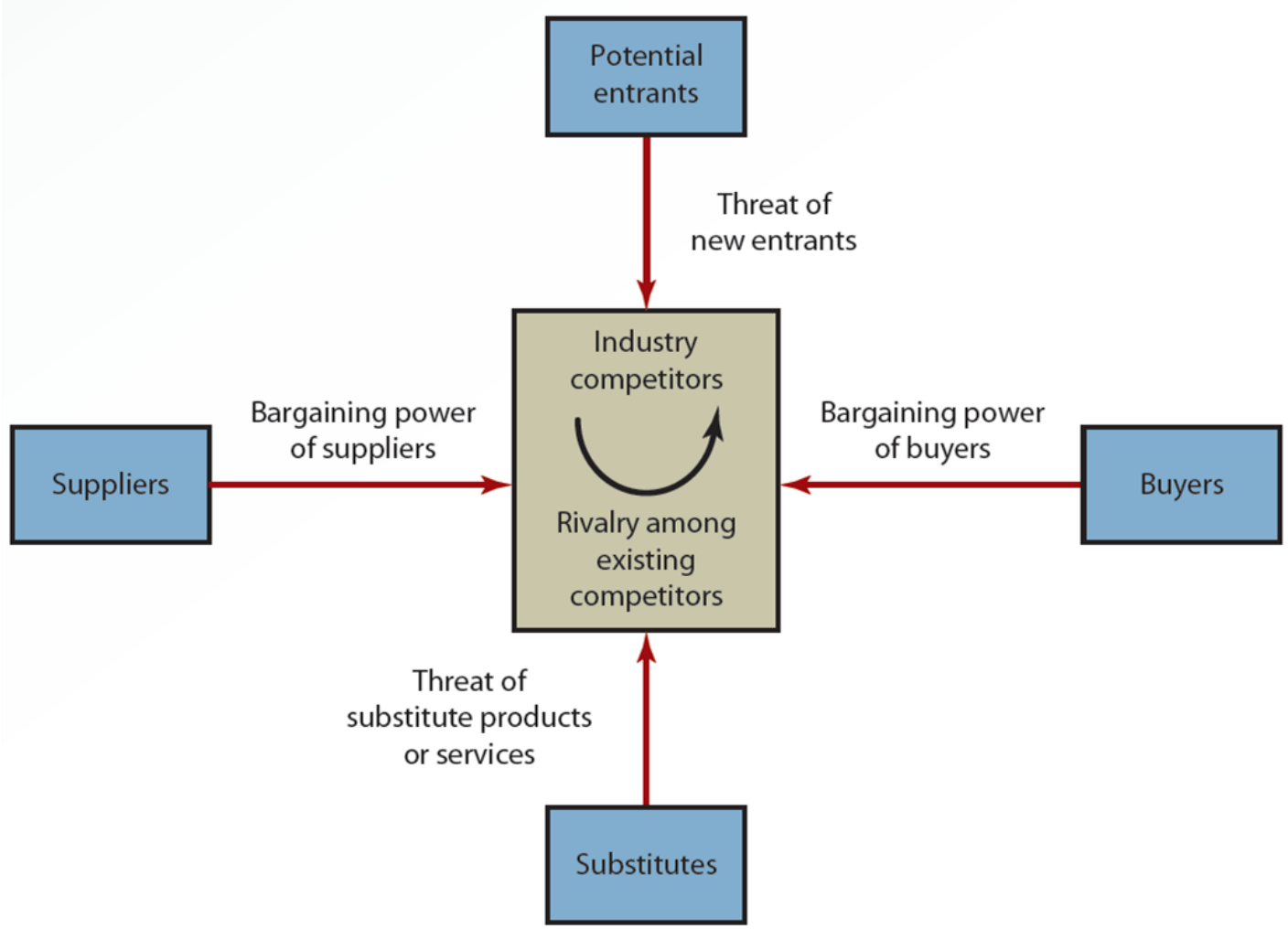
- Any other examples? Let's discuss!

Porter's Five Forces Model: Understanding the Business Environment (1 of 3)

Five Forces Model for analyzing the organization, its position in the marketplace and how information systems could be used to make the organization more competitive:

- Buyer power
- Supplier power
- Threat of substitute products or services
- Threat of new entrants
- Rivalry among existing competitors

Exhibit 1.4: The Five Forces Model



Porter's Five Forces Model: Understanding the Business Environment (2 of 3)

Buyer power

- High when customers have many choices and low when customers have few choices

Supplier power

- High when customers have fewer options and low when customers have more options

Threat of substitute products or services

- High when many alternatives to an organization's products and services are available

Porter's Five Forces Model: Understanding the Business Environment (3 of 3)

Threat of new entrants

- Low when duplicating a company's product or service is difficult
- Focus strategies are used to ensure that the threat remains low

Rivalry among existing competitors

- High when competitors occupy the same marketplace position
- Low when there are few competitors

Knowledge Check Activity 1-3

Which of the Porter's five forces model is high when customers have many products and services to choose from?

a. Supplier power

b. Threat of new entrants

c. Buyer power

d. Threat of substitute products or services

Knowledge Check Activity 1-3: Answer

Which of the Porter's five forces model is high when customers have many products and services to choose from?

Answer: Buyer power

Buyer power is high when customers have many choices and low when they have few choices.

The IT Job Market (1 of 5)

Categories of IT jobs

- Operations and help desk
- Programming
- Systems design
- Web design and Web hosting
- Network design and maintenance
- Database design and maintenance
- Robotics and artificial intelligence

Useful websites for IT job market research:

1. Linkedin Jobs
2. Indeed Jobs
3. Glassdoor
4. Levels.fyi

The IT Job Market (2 of 5)

Chief Technology Officer (CTO)/Chief Information Officer (CIO)

Oversees long-range planning and monitors new developments that can affect a company's success.

Manager of Information Systems Services

Responsible for managing all the hardware, software, and personnel within the information systems department.

The IT Job Market (3 of 5)

Systems Analyst

Responsible for the design and implementation of information systems.

Network Administrator

Oversee, design, and implement internal and external network systems that deliver correct information.

The IT Job Market (4 of 5)

Data Administrator / Database Engineer

Responsible for database design and implementation.

Computer Programmer / Software Engineer/ Software developer / Front-end Developer/ Back-end Developer / Full-stack developper

Writes programs or software segments that allow the information system to perform a specific task.

Webmaster

Designs and maintains the organization’s web site, usually for small businesses.

The IT Job Market (5 of 5)

Other high-demand IT jobs:

- Data scientist
- Data Engineer
- Hardware Engineer
- Social media manager
- Search engine optimization specialist
- Mobile development Engineer
- Cloud architect

Outlook for the Future (1 of 2)

Predictions

- Hardware and software costs will decline
- Artificial intelligence and related technologies will improve and expand
- Computer literacy of users will improve
- Networking technology will improve
- Personal computers will improve in power and quality
- Internet will grow
- Hackers will become more sophisticated

Outlook for the Future (2 of 2)

Major computing trends

- Ubiquitous computing
- Internet of Things (IoT)
- 3D and 4D printing
- Pervasive analytics
- Context-aware computing
- Smart machines and devices
- Cloud computing
- Software-defined applications and infrastructures
- Security

Summary

Now that the lesson has ended, you should be able to:

1.1 Discuss common applications of computers and information systems.

1.2 Explain the differences between computer literacy and information literacy.

1.3 Define transaction-processing systems.

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