

MANAGEMENT INFORMATION SYSTEMS 8/E

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Chapter 12

The Management Information System

Objectives

- Understand one interpretation of what a management information system (MIS) is, as well as the basic features of such a system.
- Appreciate how the MIS can be subdivided into subsystems that recognize the specific information needs of groups of managers.
- Know how to improve the information content of reports.
- Have an introductory understanding of mathematical modeling.
- Understand when computer graphics should be used.
- Understand the role of MIS in problem solving.

MIS Definition

- A computer-based system that makes information available to users with similar needs.
 - Users are typically comprise a formal organizational entity
 - Describes what has happened in the past

Early MIS Efforts

- Popular in business by the mid 1960s
- Punched card and keydriven machines were used only for data processing
- The first computers were applied the same way
- Only a few computer literate people in the firms
- Managers became aware of computer's processes and power

MIS is an Organizational Resource

■ Information

- Past, present, future
- Periodic reports, special reports, simulations

■ Similar needs

- Functional area
- Management level
- Managers and nonmanagers

An MIS Model

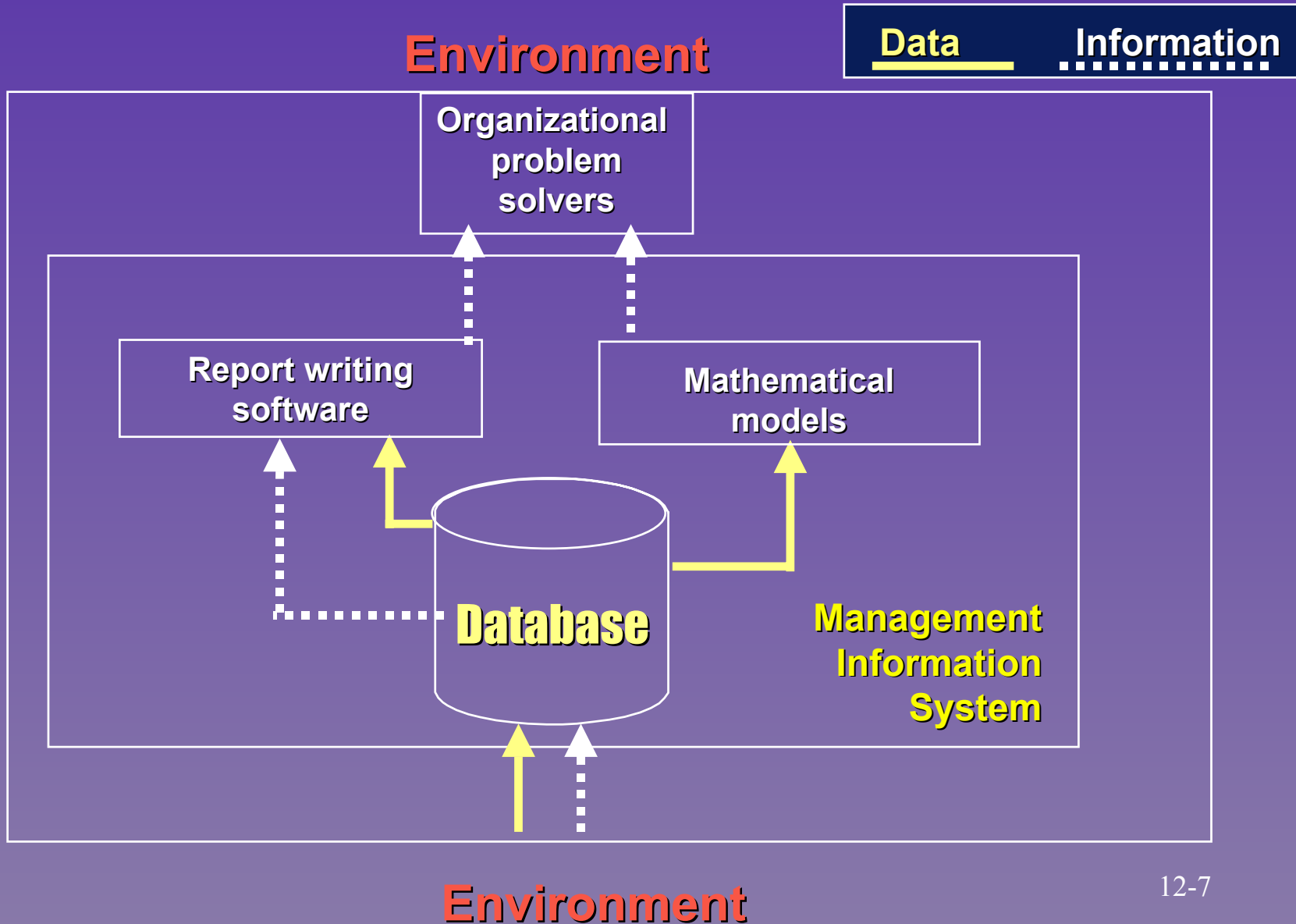
■ Database

- AIS data and information
- Environmental data and information

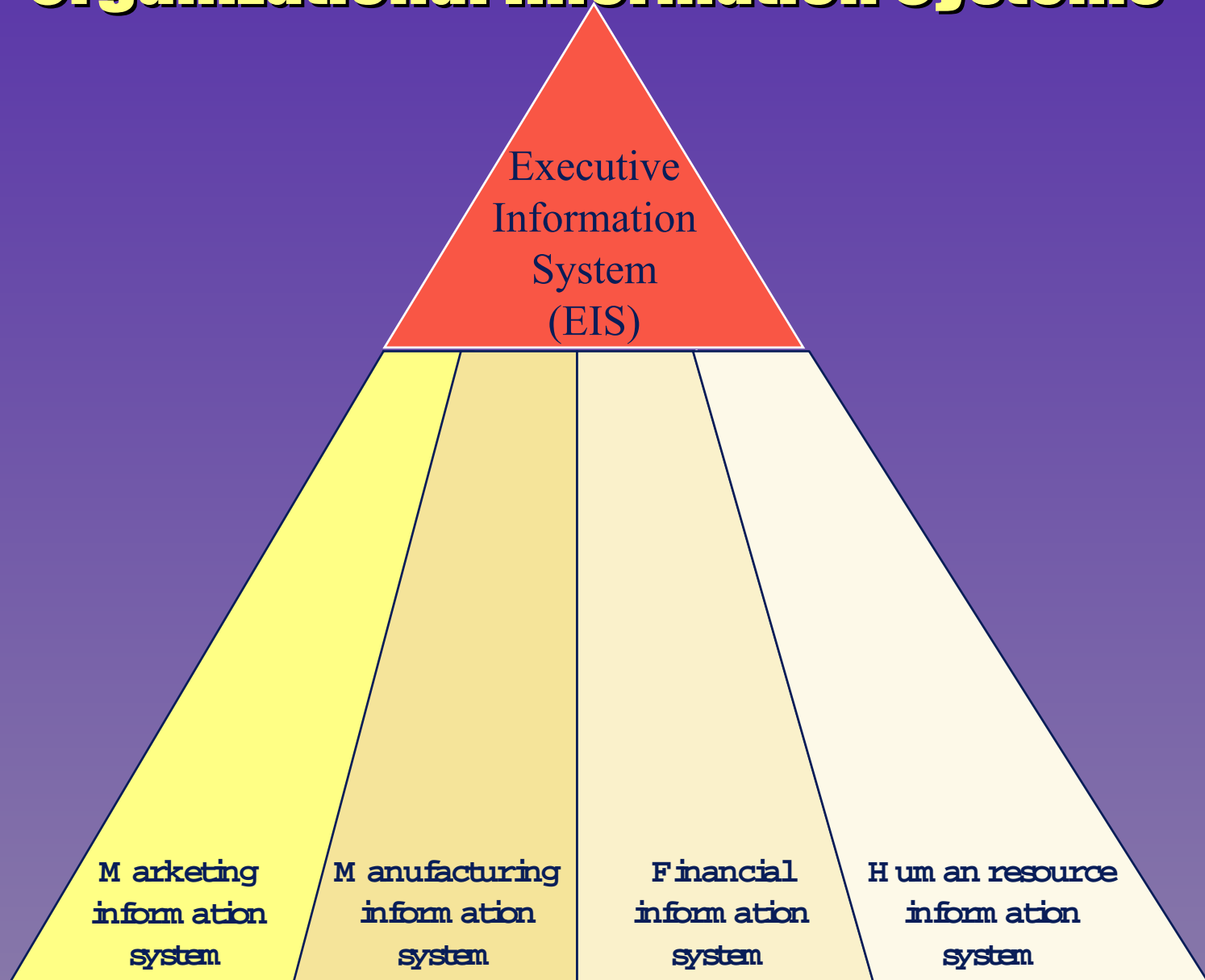
■ Interorganizational information systems (IOS)

- Firms band together with other organizations such as suppliers

An MIS Model



Organizational Information Systems



Functional Information Systems

- MIS tailored to meet users' needs for information concerning functional areas
 - Manufacturing
 - HRIS
 - Others
- Executive information systems (EIS)
- Enterprise information system
 - Pulls functional ISs together
 - Enterprise resource planning (ERP)

Report Writing Software

- Periodic and special reports may look the same
- Difference is in what *triggers* the report
 - Periodic report
 - » Produced on a schedule
 - Special report
 - » Produced when something out of the ordinary occurs

Incorporating Management by Exception

- Prepare the report only when exceptions occur
- Use the report sequence to highlight exceptions
- Group exceptions together
- Show the variance from the norm

An Overtime Earnings Report

OVERTIME EARNINGS REPORT FOR WEEK ENDING AUGUST 19

		OVERTIME EARNINGS	
Department No.	Department Name	Current Month	Year-to-Date
16-10	Receiving	\$ 2,305.00	\$ 5,319.20
16-11	Inspection	\$ 1,025.60	\$ 4,386.12
16-12	Materials Handling	\$ 3,392.50	\$12,629.00
16-13	Tooling	\$ 78.00	\$ 1,049.00
16-14	Assembly	\$ 0.00	\$ 792.80
16-15	Plating	\$ 3,504.90	\$12,635.20
16-16	Shipping	\$ 5,219.16	\$18,294.16
	TOTALS	\$15,525.16	\$55,105.48

SALES BY PRODUCT FOR THE MONTH OF JUNE

PRODUCT NUMBER	PRODUCT NAME	CURRENT MONTH SALES	YEAR-TO-DATE SALES
129875	GASKET CENTER CASE	\$ 5,090.23	\$ 31,764.00
087235	MAINSHAFT	4,760.01	29,329.45
118320	1ST MOTION SHAFT	1,789.45	28,243.59
250067	OIL SEAL REAR	11,560.24	23,450.07
228203	LAYGEAR	8,369.34	14,709.03
576000	HUB 5TH	.00	13,623.68
516012	SHIFT FORK 1-2	450.95	12,634.44
090407	SYNCHRO RING 2ND	2,243.27	9,963.58
<hr/>			
282130	BUSH SHIFT LEVER	.00	490.00
576301	OIL SLINGER	.00	11.50

AGED ACCOUNTS RECEIVABLE REPORT AS OF MAY 31

-----CUSTOMER-----		CURRENT	30-60	60-90	OVER 90	TOTAL
NUMBER	NAME	AMOUNT	DAYS	DAYS	DAYS	AMOUNT
51212	KELLY & MARLEY INC	1,003.10	20.26			1023.26
51221	KENNEDY ELECTRIC	181.34				181.34
52472	KENYON MACHINERY	443.10				443.10
53204	KEPNER DANA CO		153.26	114.14	11.12	278.52
54233	KERITE CO	367.94	101.74			469.68
54574	KEYMAN ASSOCIATES				432.71	431.71
55081	KIMBULIANS	24.12	122.81			146.93
55430	KIRSCH CO	26.30				26.30
60245	LEBEN DRILLING	1.10	476.93	174.96		652.39
60772	LEEMONT INC	35.87	35.95			71.82

SALES BY SALESPERSON REPORT FOR THE MONTH ENDING MARCH 31

SALESPERSON		CURRENT-MONTH			YEAR-TO-DATE		
NO.	NAME	QUOTA	ACTUAL	VARIANCE	QUOTA	ACTUAL	VARIANCE
0120	JOHN NELSON	1200	1083	-117	3600	3505	-95
10469	LYNN SHERRY	1000	1162	+162	3000	3320	+320
19261	DARVIN UPSHAW	800	1090	+290	2400	2510	+110
20234	JANIE EVANS	1500	1305	-195	4500	4110	-390
61604	TRAVIS BURKE	2000	2333	+333	6000	6712	+712
62083	CATHY HAGER	1000	990	-10	3000	2319	-681
63049	STEVE JENNER	1100	1250	+150	3300	2416	-884
64040	SAM MOSELY	1050	985	-65	3150	3020	-130
TOTALS		9650	10198	548	28950	27912	-1028

Modeling

- Models are abstractions
- Models may be:
 - Physical
 - Narrative
 - Graphic
 - Mathematical

Mathematical Modeling

- Most important to MIS users
- Three dimensions
 - Influence of time
 - Degree of uncertainty
 - Ability to optimize

Mathematical Model Types

■ Static

- Does not include time
- Like a snapshot

■ Dynamic

- Includes time
- Like a motion picture

Mathematical Model Types (cont.)

■ Probabilistic

- Includes probabilities of events occurring
- 0.00 to 1.00

■ Deterministic

- Events are certain
- Not random

Mathematical Model Types (cont.)

■ Optimizing

- Selects best solution
- Requires structured problems

■ Suboptimizing

- Also called satisficing
- Model identifies outcomes for manager to select among

Simulation

- Use of a model is called simulation
- Scenario
 - Conditions that influence the simulation
 - Scenario data elements
- Decision variables
 - Input values
- Output format varies

Simulation (cont.)

■ Simulation Technique

- Single scenario for optimizing model
- What-if game for suboptimizing models
- Change only single decision variable per run
- Systematically discover answers to problems

■ Output format

- Include both decision variables and outcomes on same report

Modeling Example

- Use model to simulate the effect of:
 - Price of product
 - Amount of plant investment necessary to provide sufficient capacity
 - Amount to invest in marketing activity
 - Amount to invest in R & D
- Enter model input
- Review model outputs

More on Modeling

■ Advantages

- Can be a learning experience
- Speed allows consideration of more options
- Provides predictive power
- Less expensive than trial-and-error method

■ Disadvantages

- Difficult to model a business system
- High degree of mathematical skills required

INVENTORY PLANNING MODEL

OCTOBER 11

SCENARIO:

BEGINNING BALANCE: 200

DAILY SALES UNITS: 20

DECISIONS:

ORDER QUANTITY: 100

REORDER POINT: 175

LEAD TIME: 3

RESULTS:

	BEGINNING			ENDING	ORDER	RECEIPT
DAY	BALANCE	RECEIPTS	SALES	BALANCE	QUANTITY	DUE DATE
1	200		20	180	25	5
2	180	50	20	160		
3	160		20	140		

Graphic Output

- Use graphics to
 - present a quick summary
 - detect trends over time
 - forecast activities
 - seek relatively simple impressions from a large volume of data

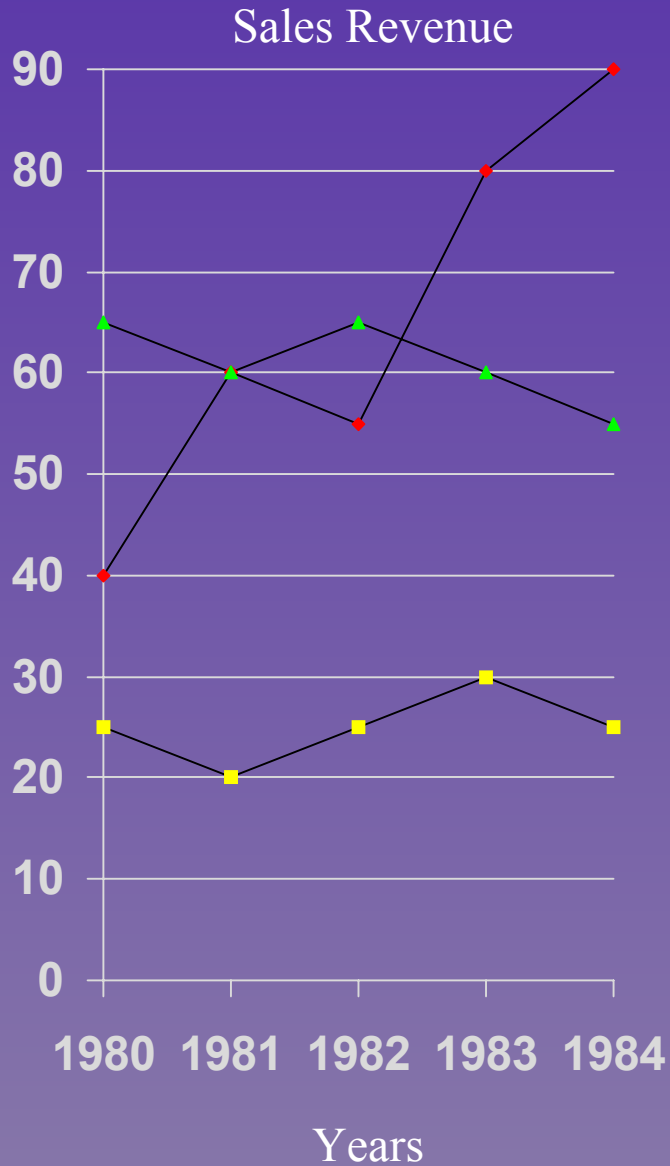
Graphical Output

- Reports and model outputs can be produced in tabular or graphical form
- Spreadsheets have encouraged the use of graphics
- Can improve decision making capability

Which Graphs to Use

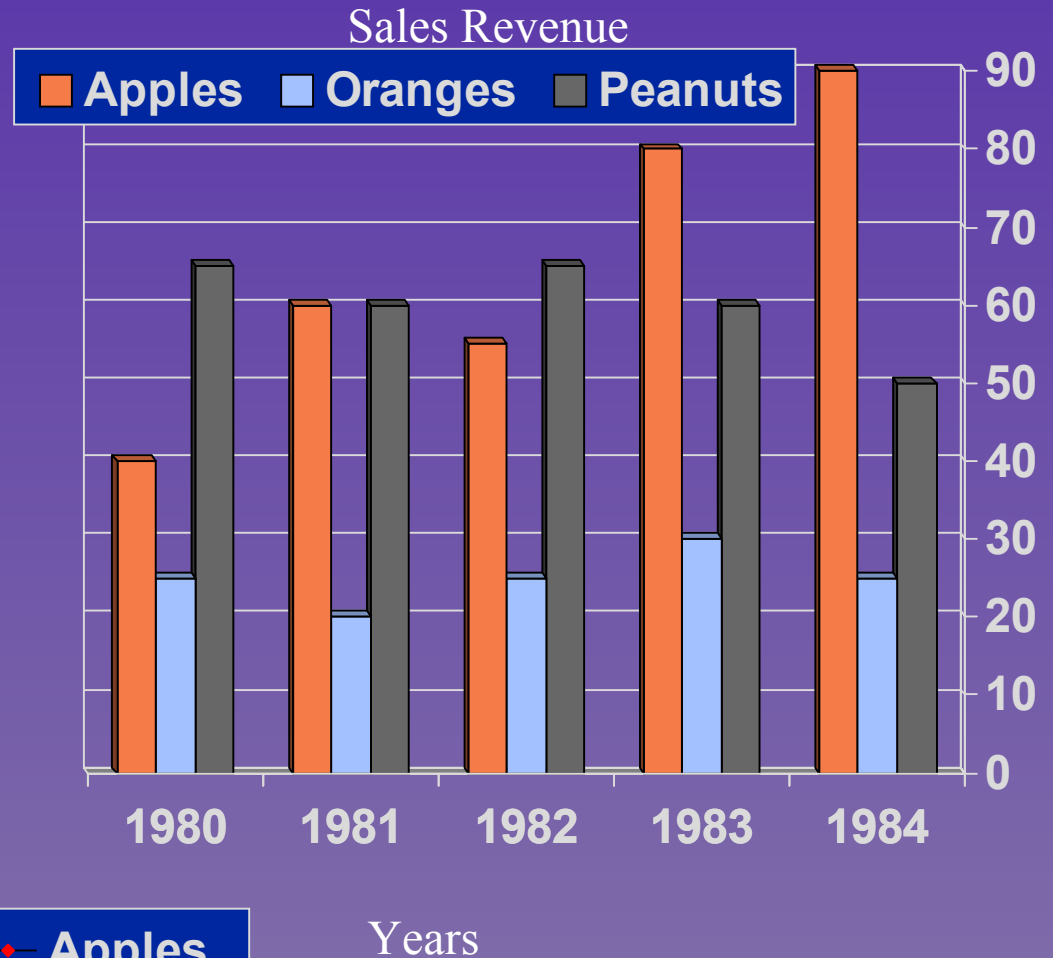
- Line or bar charts are best to summarize data
- Grouped line or bar charts show trends over time
- Grouped bar charts are better for representing parts of a whole
- Compare variables using horizontal, not vertical, bars
- Use single line or bar charts to compare data points

GROUPED/MULTIPLE LINE CHART



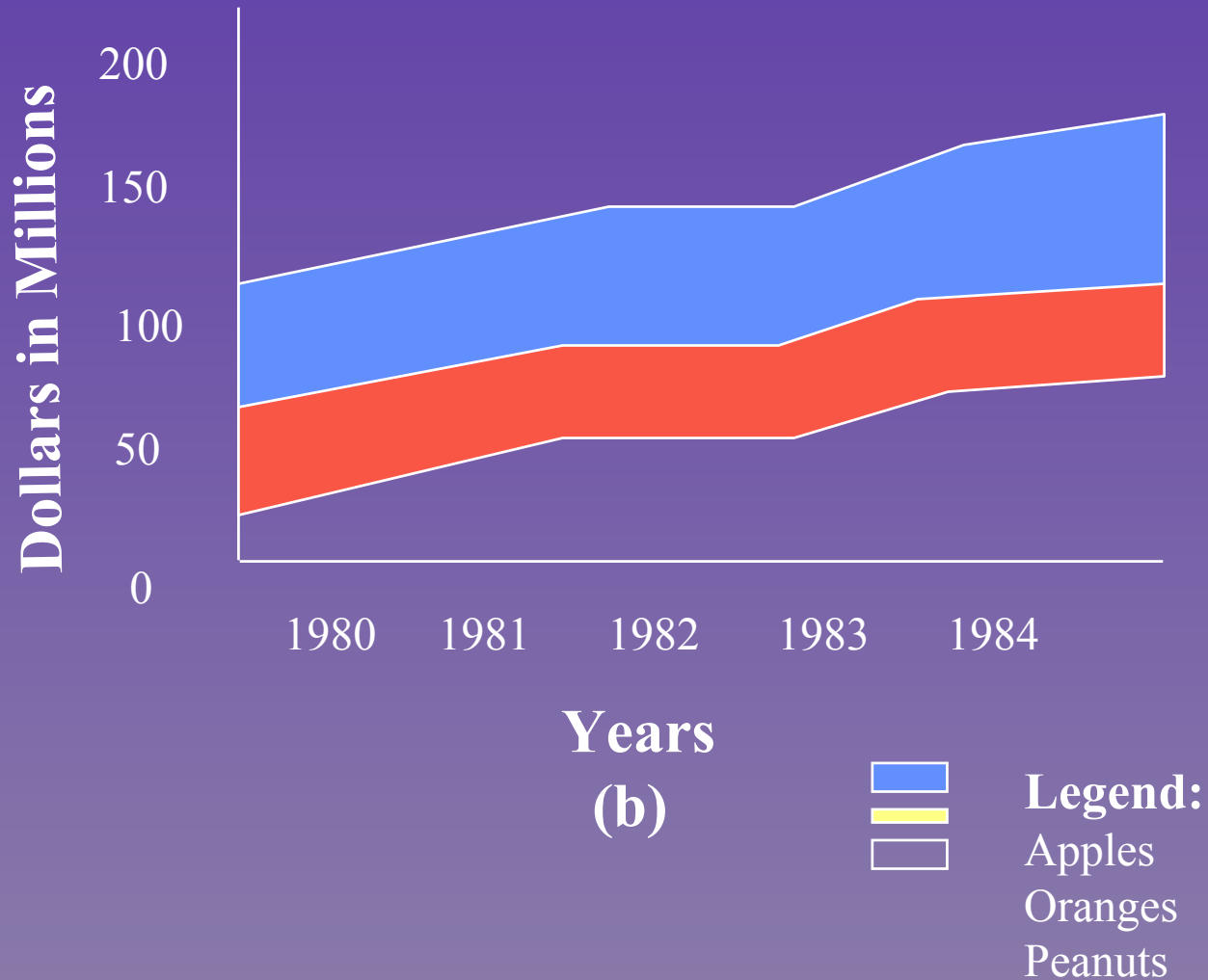
(a)

GROUPED BAR CHART

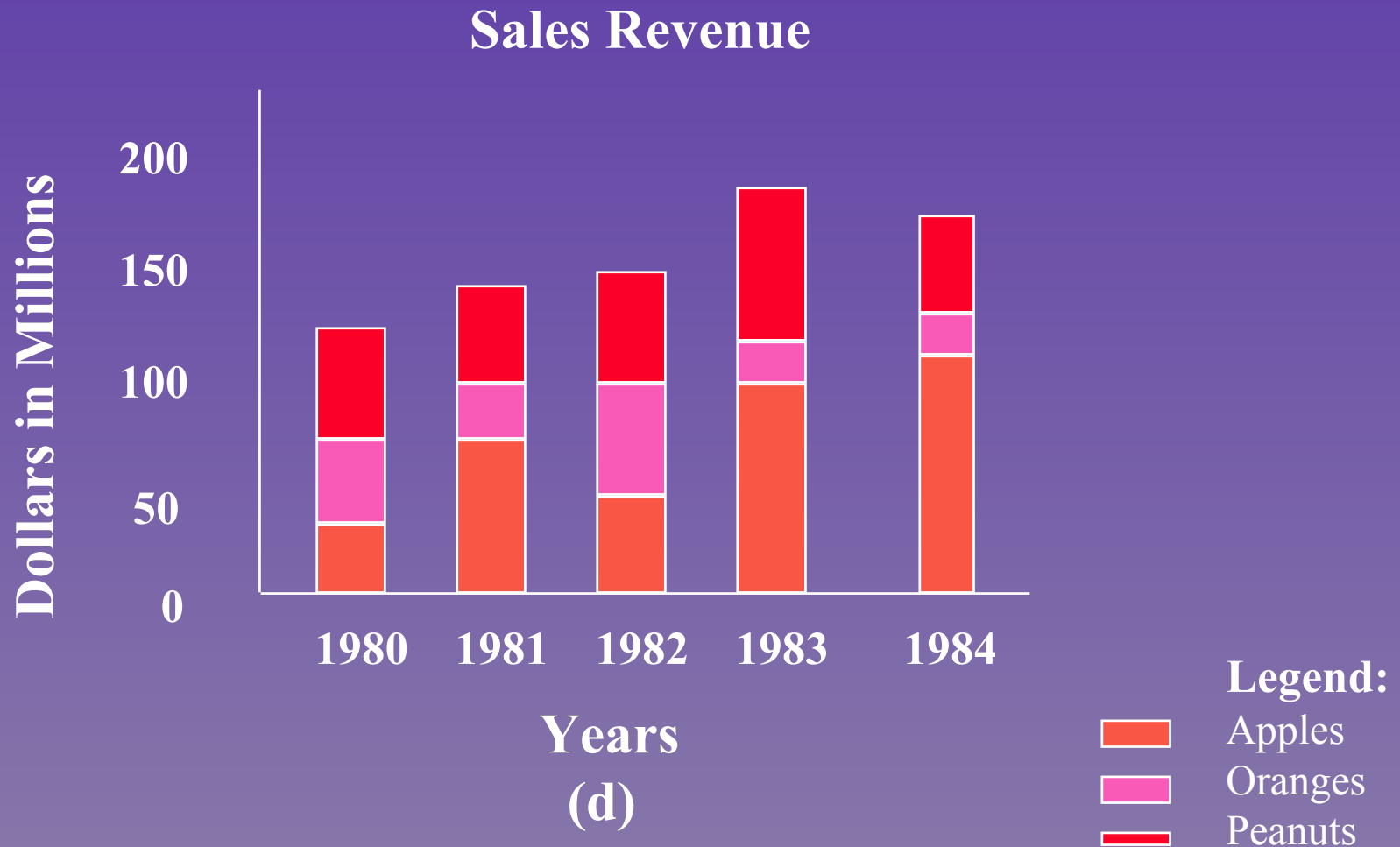


(c)

Segmented Line Chart



Segmented/Divided Bar Chart



Human Factors Consideration

- Behavioral influences can affect employees in their computer-related tasks
- Fear
 - Replacement of people by computers
 - Computer systems tailored to organizations, not individuals
 - Managers and line workers are affected

Minimizing Fear

- Use computer as a means of achieving job enhancement
- Use formal communications to keep employees aware of firm's intentions
- Build a relationship of trust with employees
- Align employees' needs with firm's objectives

Putting the MIS in Perspective

- The first attempt to make information available to *management*
- Enjoyed its greatest prominence in the 1960s when it first originated
- Now integrated throughout the firm

MIS and Problem Solving

- Organizationwide information resources
 - Provides problems solving information
 - Sets stage for accomplishment in other areas such as DSS, the virtual office, and knowledge-based
- Problem identification and understanding
 - Main idea is to keep information flowing to the manager
 - Manager uses MIS to signal impending problems
- Main weakness is that it is not aimed at individual problem solvers

Summary

- MIS is an organizational reason providing information to managers with similar needs
- Functional MISs began to emerge
- MIS subsystems
 - Report-writing software
 - Mathematical models
- Management by exception can be incorporated

Summary (cont.)

- Mathematical modeling
 - Only an approximation
- Computer graphics
- Behavioral influences
- Quality of IS

Case Study

1. Exception reporting occurs only when the exception is negative (such as less than expected sales), not when the exception is positive.

A) true

B) false

2. MISs can only create reports that are hardcopy.

A) true

B) false