Overview IS and ISM

[shim] chap 1& 2

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Information Process Cycle

- Information Process Cycle
  - Computer-based IS (CBIS) take data as raw material, process it, and produce information as output

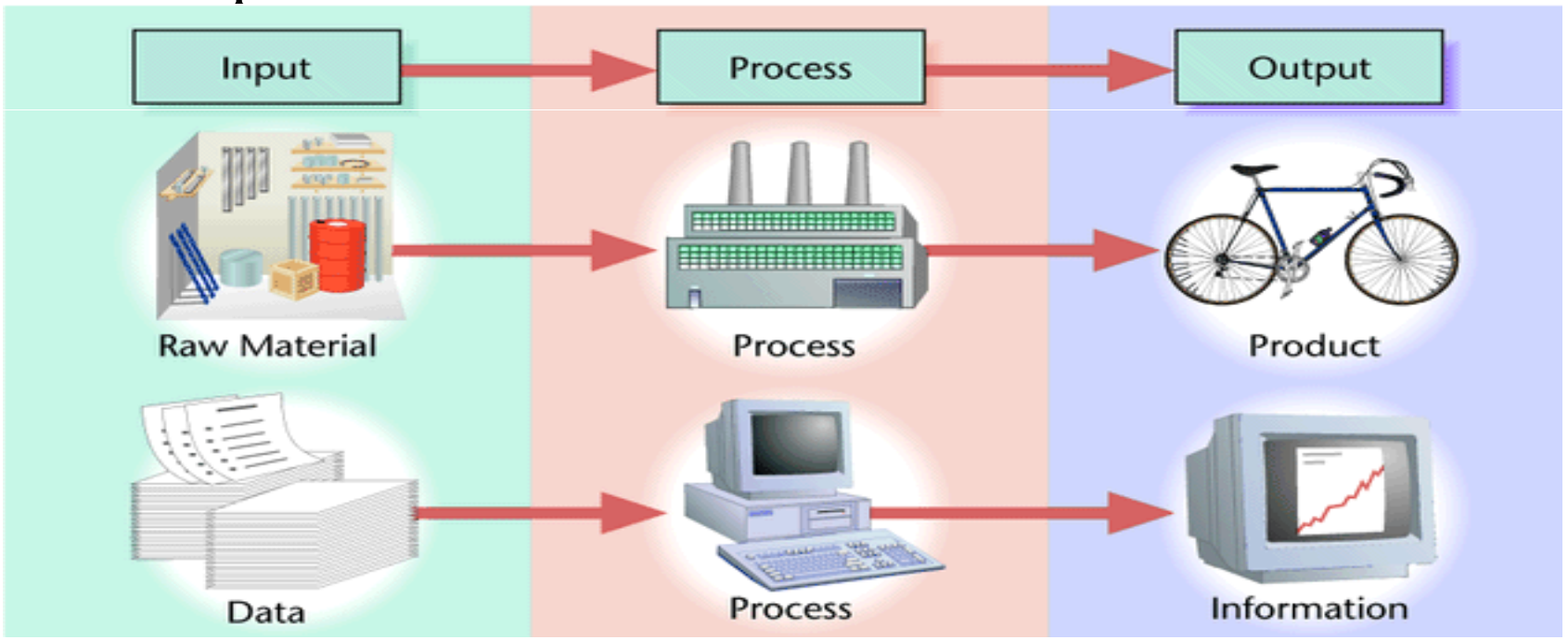


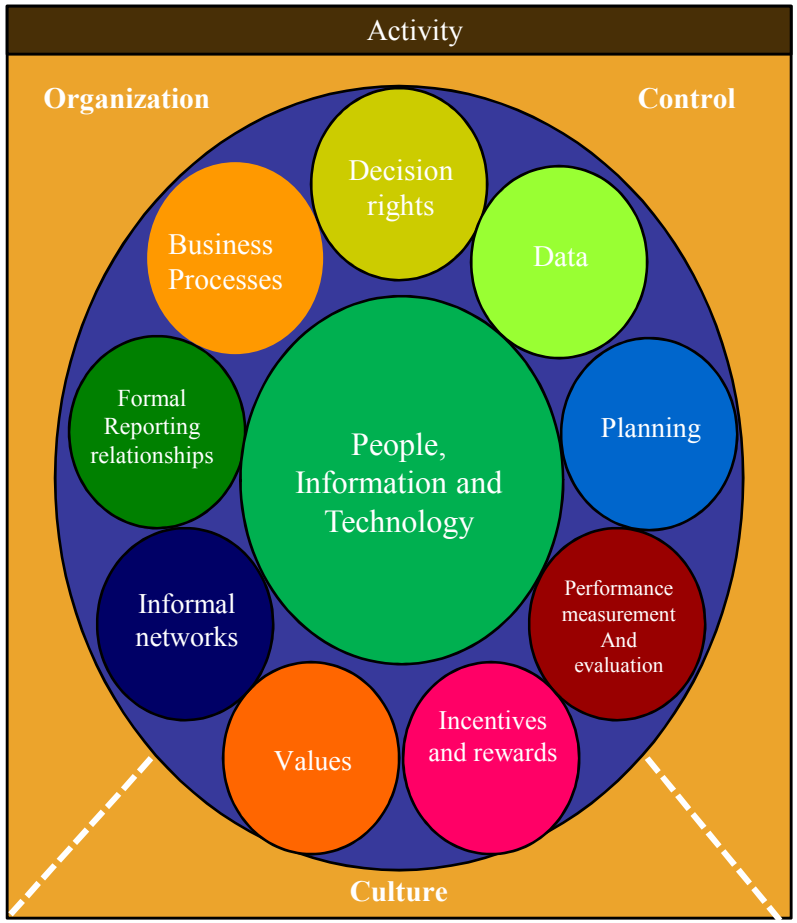
Figure 1.1 Input-process-output

Elemen IS dan MSI

- Computer Hardware
  - PC/Notebook (Client)
  - Server (mainframe)
  - Data Communication
- Computer Software
  - Operating System
  - Application
- Enterprise
  - Organisation
  - Human capital and IT Demand
  - Decision support system
  - POAC
  - Evaluation
  - Information resource (in house operatio, outsourcing)

Activity support by Information

IS Management



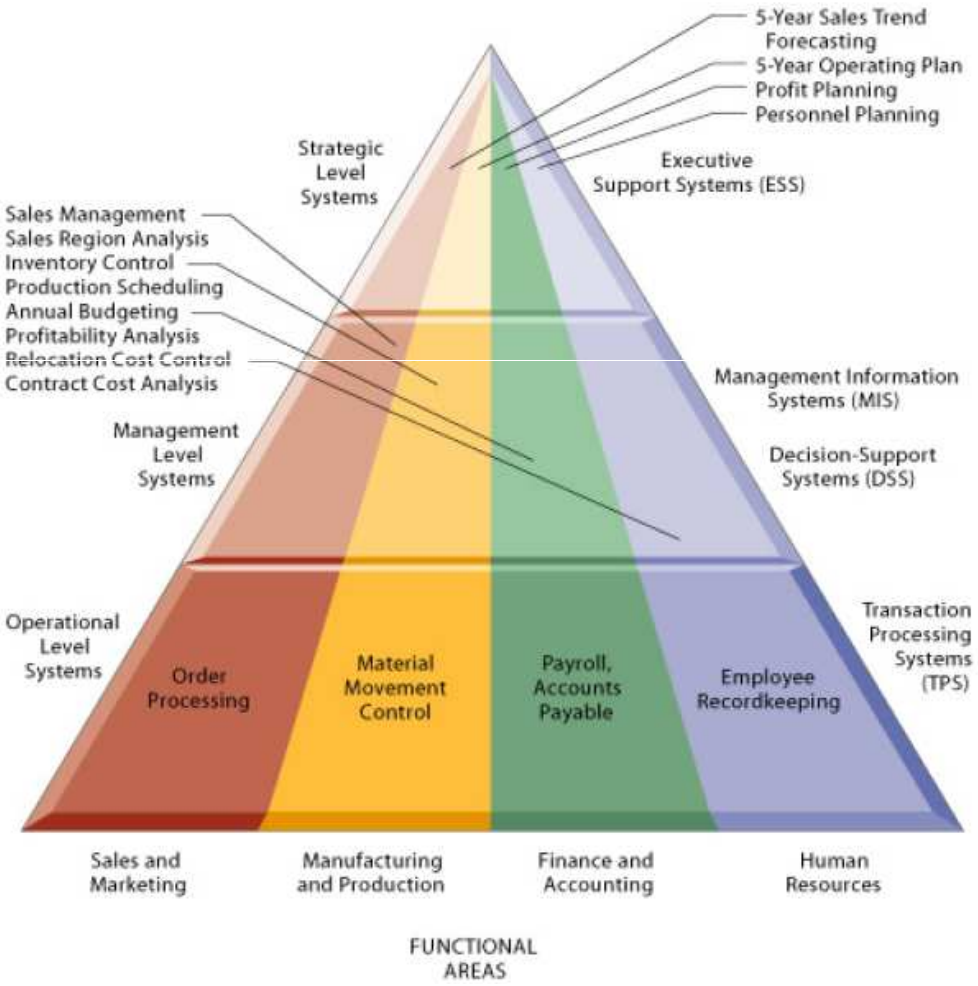
IS Governance

IS Strategy

IS Audit

Knowledge Management

FOUR MAJOR TYPE OF INFORMATION SYSTEM IN MANAGERIAL LEVEL



ENTERPRISE APPLICATION ARCHITECTURE

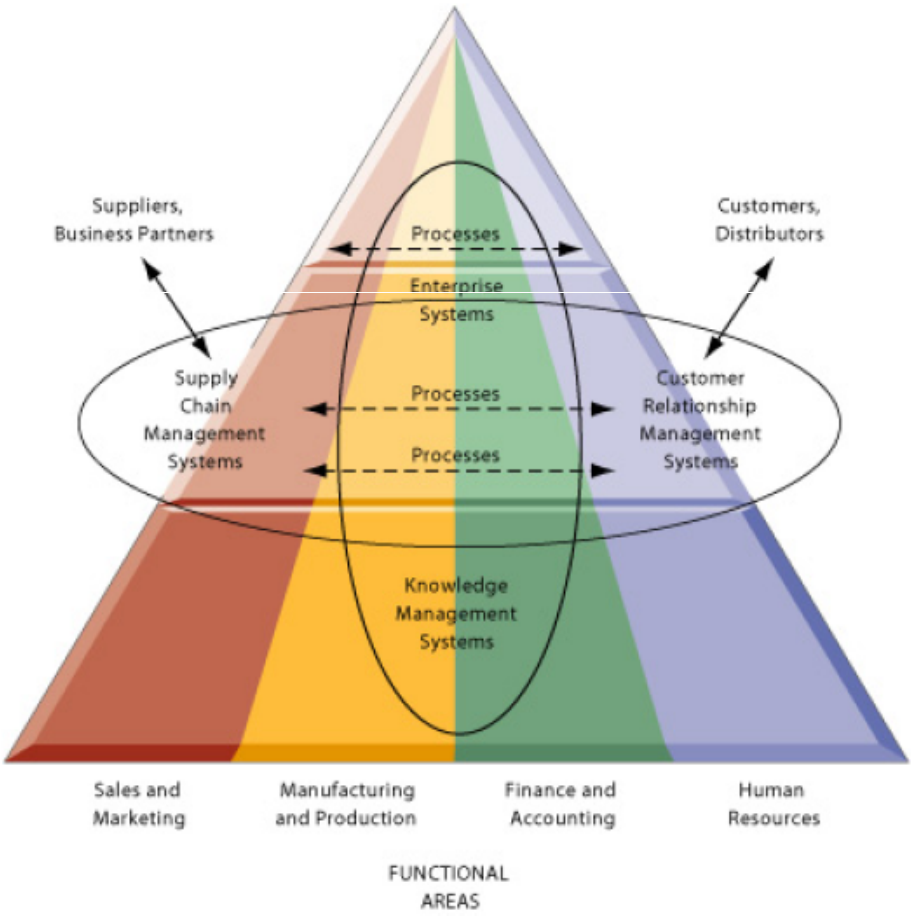


Table 5.1 An information systems classification

Type of information system	*Transferable features*	*Examples*
Transaction processing system	Control, procedures and rules, repetition	Processing credit card payments
Management information system	Emphasis on measurement and performance monitoring	Sales/production reports, receivables report showing invoices and payments
Decision support system	User control, models, semi-structured tasks	Production data models, insurance policy alternatives, current specification for machine operator
Executive information system	User-friendly interface and methods for data analysis	Flexible access to regional sales/corporate financial/ production data
Expert system	Use of inference in problem-solving, 'what if' scenarios, user-driven	Diagnosis of machine failure, pricing competitive bids, identifying trend changes
Office automation system	Multiple forms of information, immediacy and interactivity of communication, avoidance of unproductive work	Spreadsheets, email, e-calendars, desktop publishing, voicemail, video conferencing

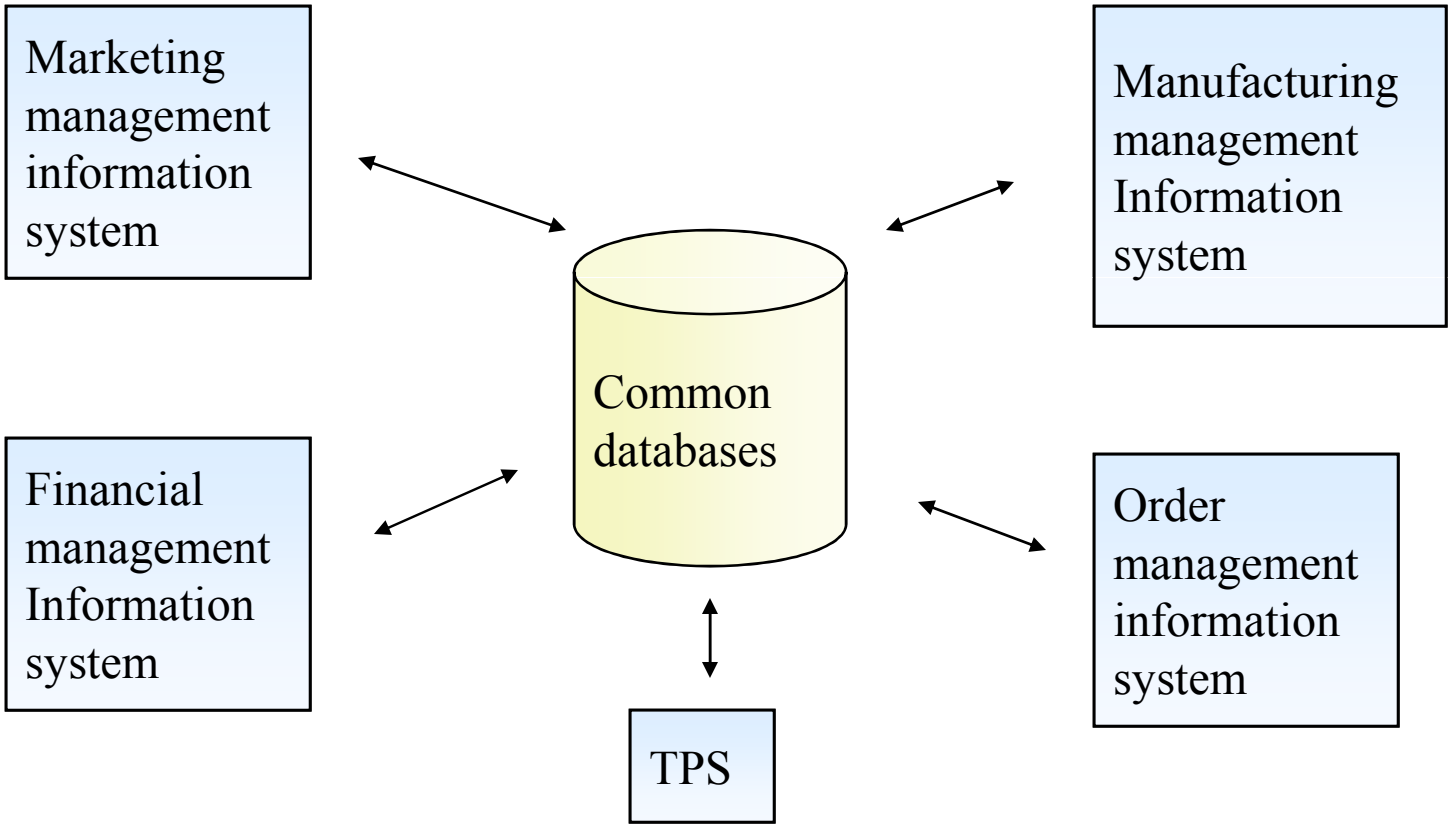
Table 5.2 Types of information systems

Information system type	*Purpose*
Office automation system	Provides effective processing of organisational and business data, creates documents.
Communication system	Helps people work together by interacting and sharing information in many forms.
Transaction processing system	Collects and stores information about and controls some aspects of transactions.
Management information system and executive information system	Converts TPS data into information for monitoring and managing performance; provides easily accessible, interactive information.
Decision support system	Helps people make decisions by providing information, models or analytical tools.
Enterprise system	Creates and maintains consistent data-processing methods and an integrated database across multiple business functions.

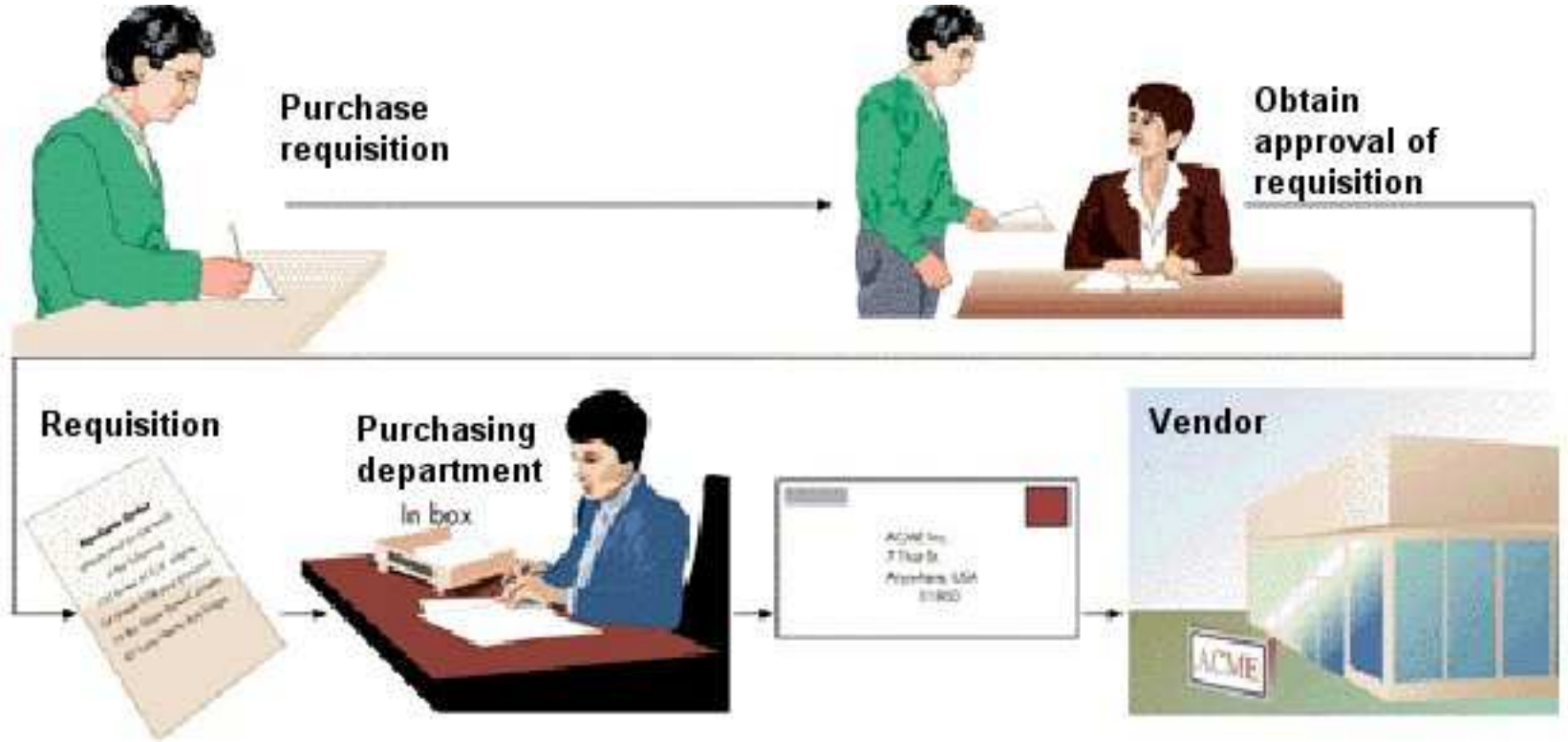
IS Classification in Organisation

- Transaction Processing System (TPS)
- Management Reporting System (MRS)
- Executive Information System and support (EISS)
- Decision Support System (DSS)
- Office Information System (OIS)

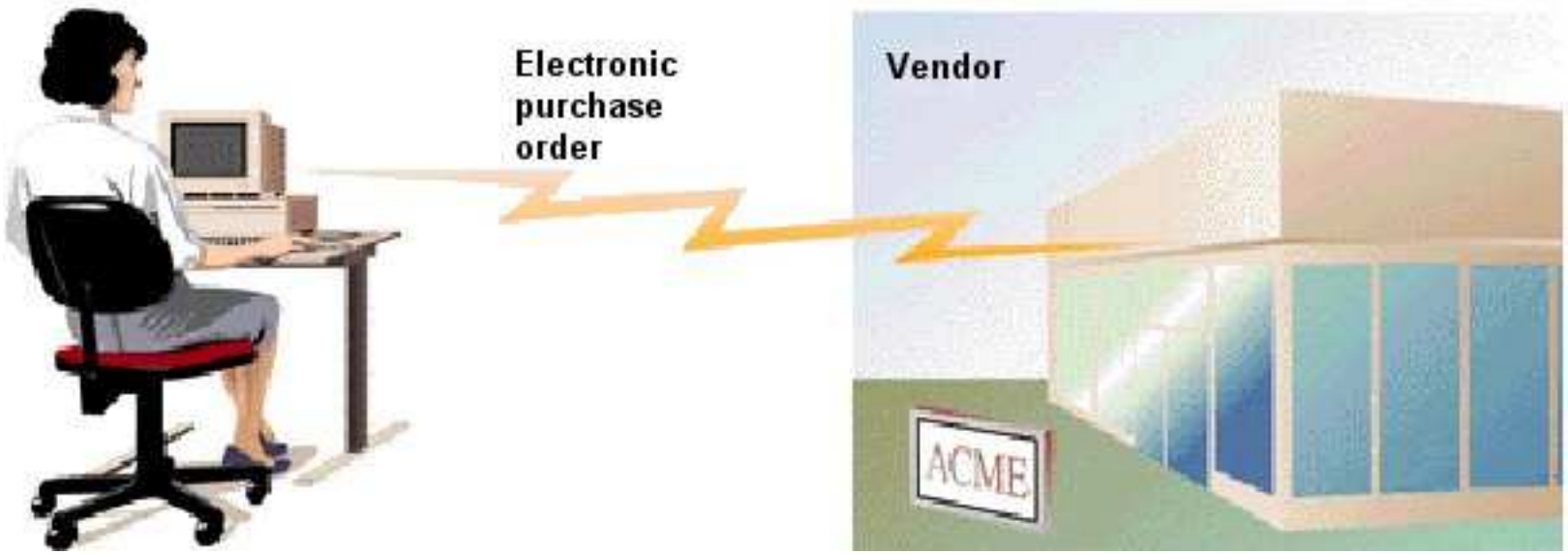
MIS Schematic



Purchase Order - Traditional



Purchase Order – E-commerce



Manajemen Report

- Schedule Report
- On demand Report
- Exception Report
- Predictive Report
- Summary Report

Characteristics of good management reports

All the reports discussed above relate to business performance, and the value of information presented in them can be enhanced in the following ways:

- if reports are presented as frequently as is cost effective;
- if they are provided as soon after the reporting period as possible;
- by giving credit to good performance and highlighting reasons for below average performance;
- by including only controllable items;
- if reports are accurate and full comparisons made;
- by emphasising exceptional items requiring management attention.

Sumber Informasi

- In house operation
- Outsourcing

Managerial Task Hierarchy

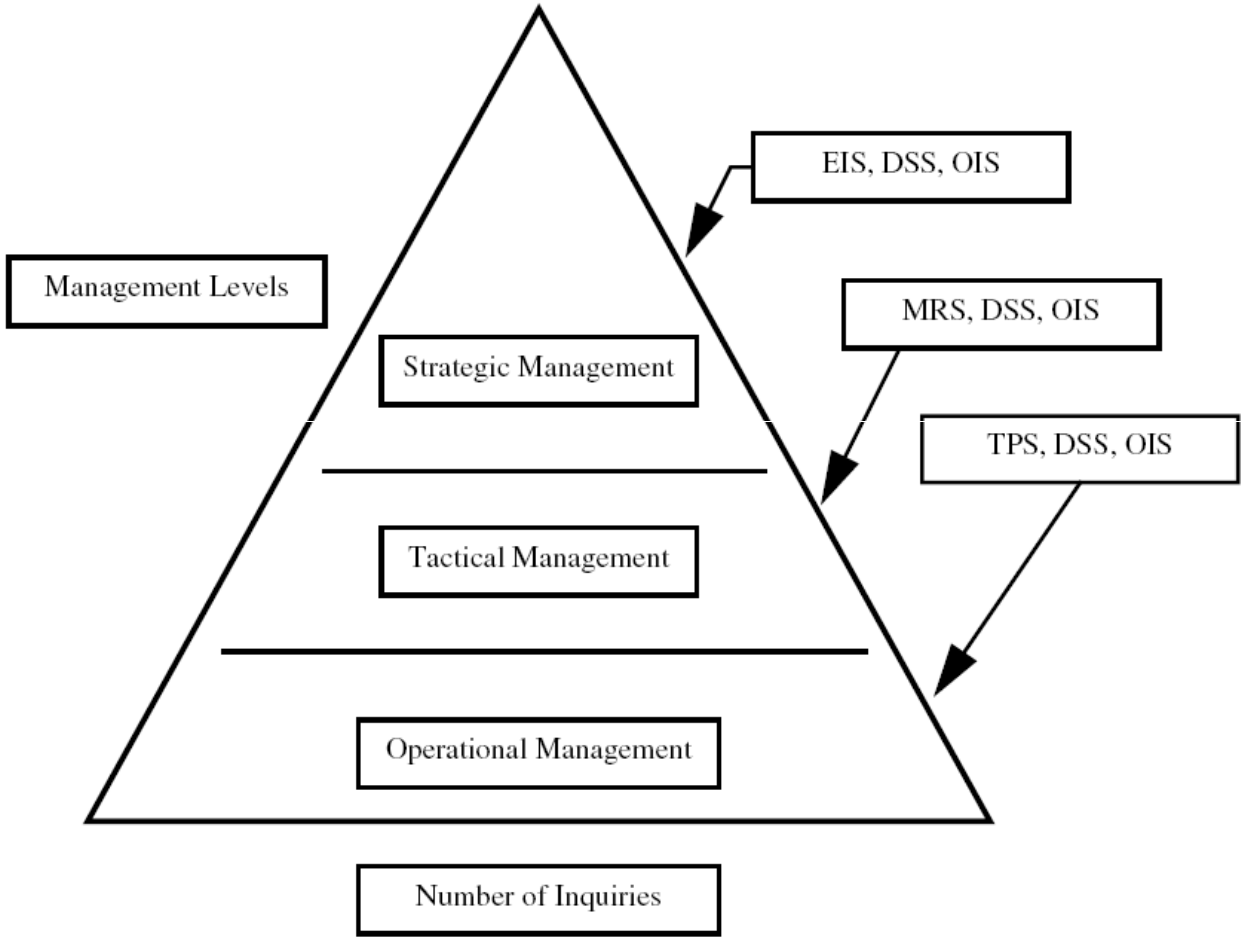


FIGURE 1.1 Management Task Hierarchy

Level of Management: What kind of Decision are made

TABLE 2.1
A Comparison of the MISs at the Operational, Tactical, and Strategic Levels

Characteristic	Operational	Tactical	Strategic
Frequency	Regular, repetitive	Mostly regular	Often ad hoc (as needed)
Dependability of results	Expected results	Some surprises may occur	Results often contain surprises
Time period covered	Past	Comparative	Future
Level of data	Very detailed	Summaries of data	Summaries of data
Source of data	Internal	Internal and external	Internal and external
Nature of data	Highly structured	Some unstructured data	Highly unstructured (semistructured)
Accuracy	Highly accurate data	Some subjective data	Highly subjective data
Typical user	First-line supervisors	Middle managers	Top management
Level of decision	Task-oriented	Control and resource allocation oriented	Goal-oriented

MSI dan Decision Making Model

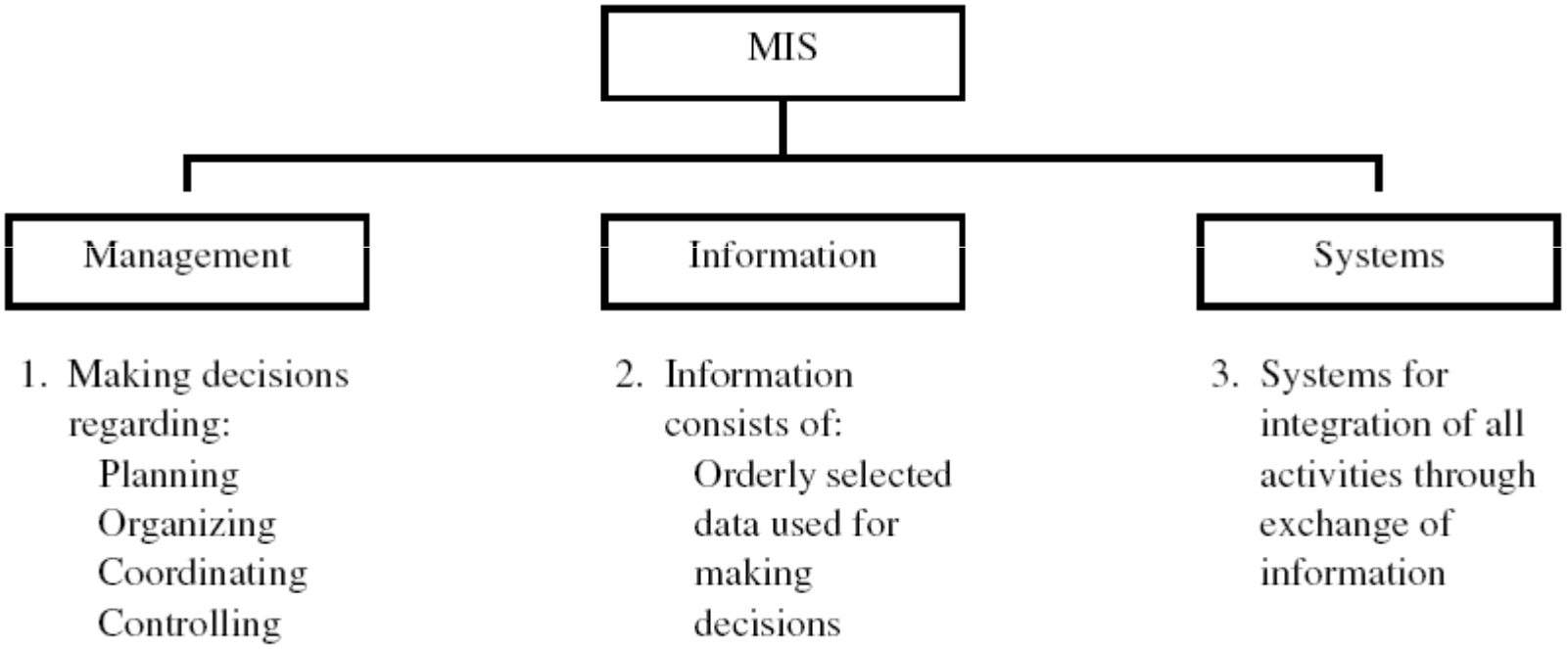
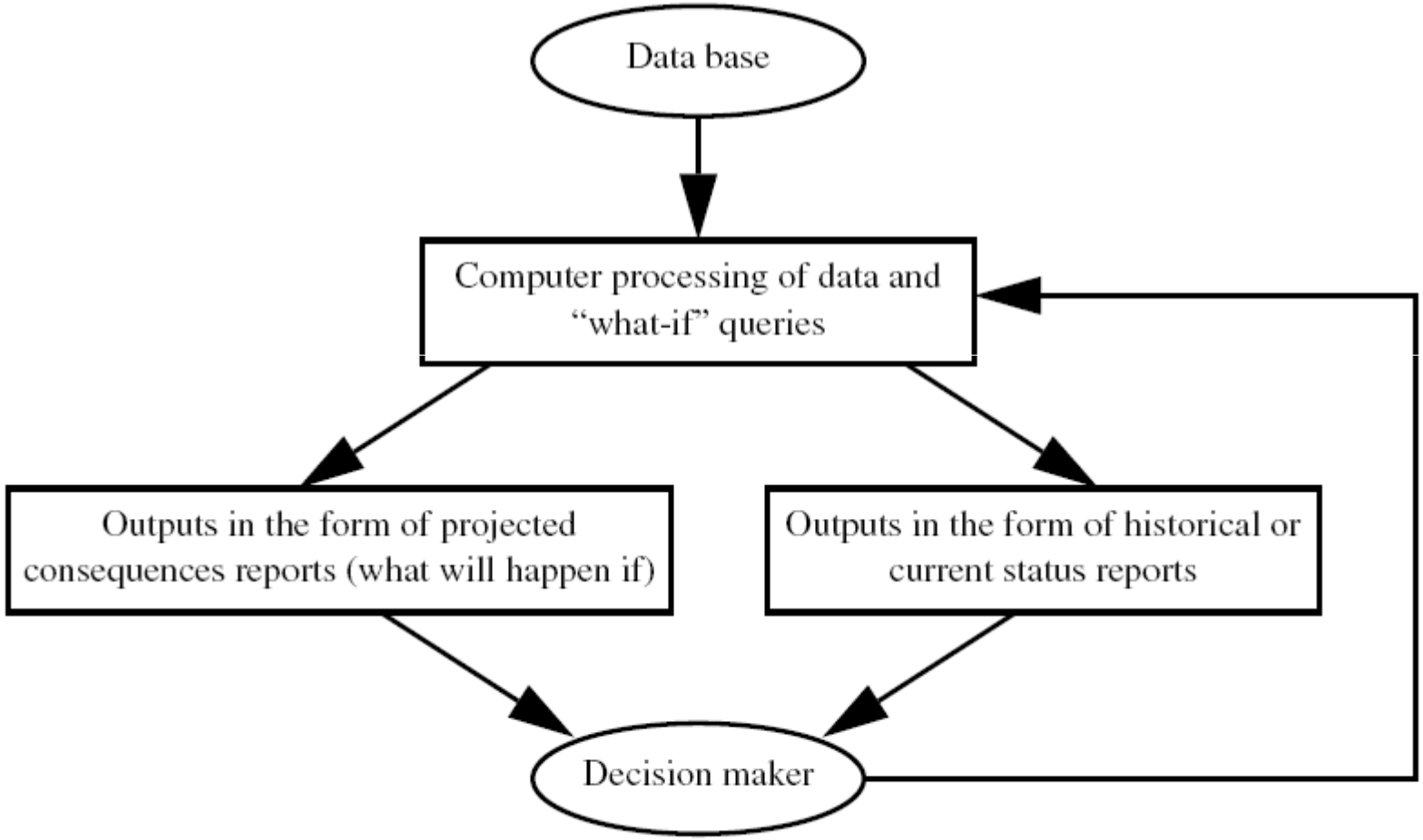


FIGURE 2.1 The meaning of a management information system (MIS).

Klasifikasi MSI berdasarkan output

- MSI that generate report
- MSI that answer ‘what-if’ kind of question asked by management
- MSI that support Decision Making (Decision Support System)


Data base
Computer processing of data and "what-if" queries
Outputs in the form of projected consequences reports (what will happen if)
Outputs in the form of historical or current status reports
Decision maker

Level Managemen

- Lower Management (Supervisory/Operational)
- Middle Management (Tactical)
  - Deal with semistructured decision
- Top Management (Strategy)
  - Title: CEO, COO, CFO, CIO

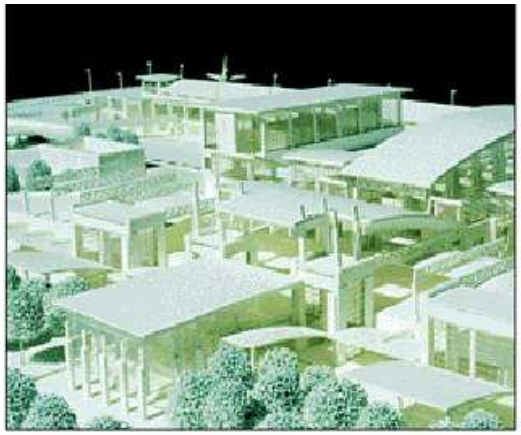
TABLE 2.2
Three Levels of Management and Information Needs

	Consumer Product Business
Strategic	Competitive
Planning	Industry statistics
Tactical	Sales analysis by customer Reorder analysis of new products Sales analysis by product line Production planning
Operational	Bill of materials Manufacturing specifications Product specifications Order processing On-line order inquiry Finished goods inventory Accounts receivable General ledger

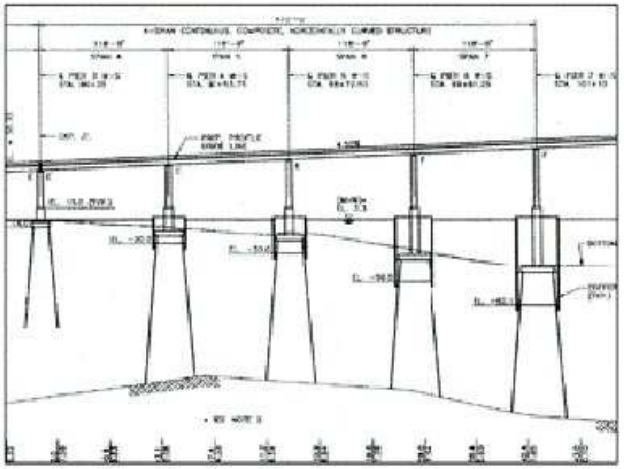
	Bank
Strategic	Market forecast
Planning	New product development
	Financial forecast
Tactical	Branch profitability
	Product profitability
Operational	Loan billing
	Accounting systems
	Policy issuance and maintenance

Pemodelan MSI

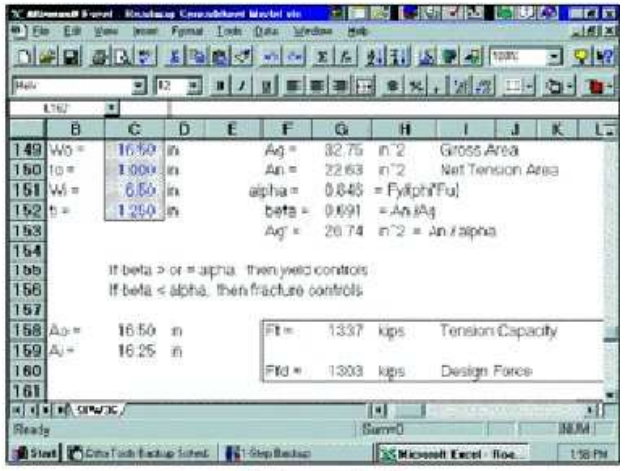
Narrative



Physical



Schematic



Mathematical

Graphical Model

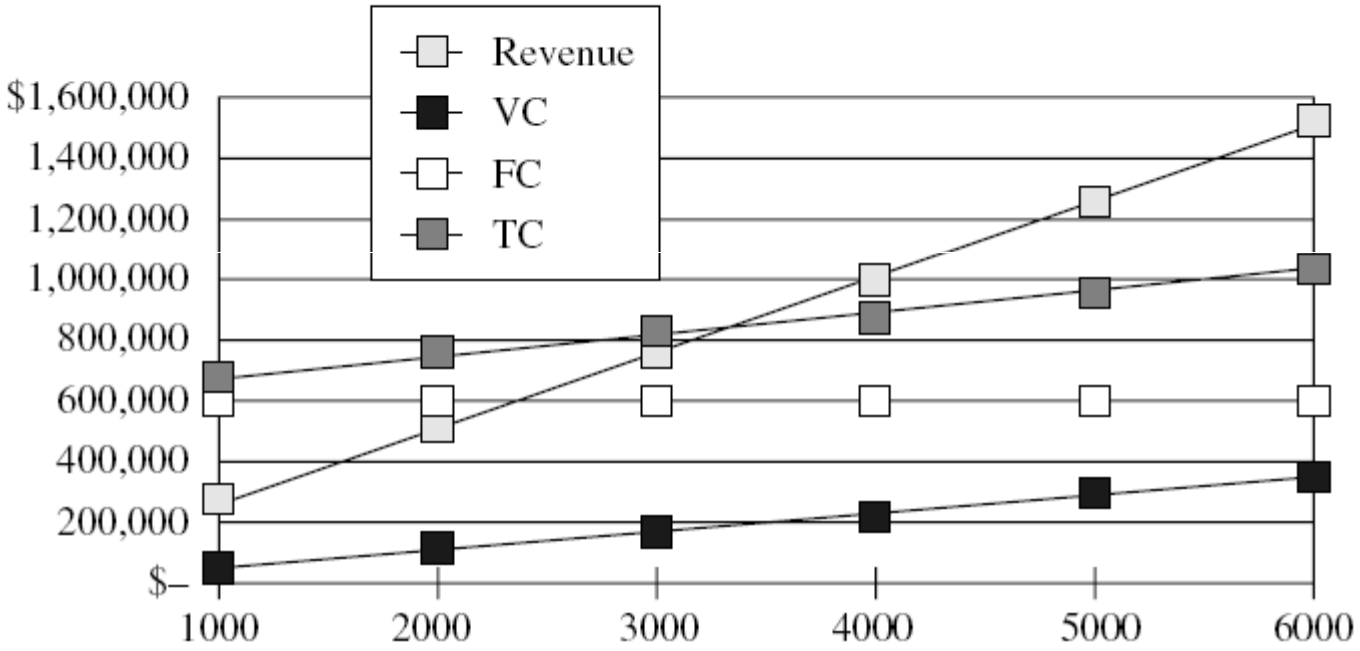


FIGURE 2.4 Break-Even Chart

Mathematical Model

- Break event point:

$$X_{be} = \frac{FC}{(P - V)}$$

  - X_b = break-even point,
  - P = price or average revenue per unit,
  - V = unit variable cost, and
  - FC = total fixed costs

Model Management Software

- Financial Model
  - Cash flow
  - Internal rate and return
  - Investment analysis

- Statistical Model
  - Summary statistic
  - Trend projection
  - Hypothesis testing
  - Software: SPPS (Statistical Packages for Social Scientist), SAS (Statistical Anaylisis System), minitab

Contoh Statistical Model

Cypress Consumer Products Corporation wishes to develop a forecasting model for its dryer sales by using multiple regression analysis. The marketing department prepared the following sample data.

Month	Sales of Washers (x_1)	Disposable Income (x_2)	Savings (x_3)	Sales of Dryers (y)
January	$45,000	$16,000	$71,000	$29,000
February	42,000	14,000	70,000	24,000
March	44,000	15,000	72,000	27,000
April	45,000	13,000	71,000	25,000
May	43,000	13,000	75,000	26,000
June	46,000	14,000	74,000	28,000
July	44,000	16,000	76,000	30,000
August	45,000	16,000	69,000	28,000
September	44,000	15,000	74,000	28,000
October	43,000	15,000	73,000	27,000

* * * * MULTIPLE REGRESSION * * * *

Equation Number 1 Dependent Variable SALESDRY

Block Number 1 Method: Enter SALESWAS INCOME SAVINGS

Variable(s) Entered on Step Number

1. SAVINGS
2. SALESWAS
3. INCOME

Multiple R	.99167
R Square	.98340
Adjusted R Square	.97511
Standard Error	.28613

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	3	29.10878	9.70293
Residual	6	.49122	.08187

F = 118.51727 Signif F = .0000

Variables in the Equation

Variable	B	SE B	Beta	Tolerance	VIF	T
SALESWAS	.596972	.081124	.394097	.964339	1.037	7.359
INCOME	1.176838	.084074	.752425	.957217	1.045	13.998
SAVINGS	.405109	.042234	.507753	.987080	1.013	9.592
(Constant)	–45.796348	4.877651			–9.389	

Durbin-Watson Test = 2.09377

FIGURE 2.5 SPSS for Windows.

Optimization Model

- Techniques for establishing complex sets of mathematical equations and inequalities that represent objectives and constraints
- Sering disebut riset operasi, linier programming
- Contoh Aplikasi:
  - Selecting least-cost mix of ingredients for manufactured products
  - Developing an optimal budget
  - Determining an optimal investment portfolio (or asset allocation)
  - Allocating an advertising budget to a variety of media
  - Scheduling jobs to machines
  - Determining a least-cost shipping pattern
  - Scheduling flights
  - Gasoline blending
  - Optimal manpower allocation
  - Selecting the best warehouse location to minimize shipping costs

Contoh Linear Programming

- The JKS Furniture Manufacturing Company produces two products: desks and tables. Both products require time in two processing departments, the Assembly Department and the Finishing Department. Data on the two products are as follows: The company wants to find the most profitable mix of these two products

Processing	Products		Available Hours
	Desk	Table	
Assembly	2	4	100
Finishing	3	2	90
Contribution margin per unit	$25	$40	

Step 1

Define the decision variables as follows:

A = Number of units of desk to be produced

B = Number of units of table to be produced

Step 2

The objective function to maximize total contribution margin (CM) is expressed as

Total CM = 25A + 40B

Then, formulate the constraints as inequalities.

$2A + 4B \leq 100$ (assembly constraint)

$3A + 2B \leq 90$ (finishing constraint)

In addition, implicit in any LP formulation are the constraints that restrict A and B

to be nonnegative, i.e.,

$A, B \geq 0$

Our LP model is:

Maximize: Total CM = 25A + 40B

Subject to: $2A + 4B \leq 100$

$3A + 2B \leq 90$

$A, B \geq 0$

Decision analysis model with uncertainty

- Decision Analysis Model with uncertainty:

  Diatasi dengan
  - Expected value
  - Standard deviasi
  - Coeficient of variation
- Decision Matrix
- Decision Tree

		Initial Investment (1)	Probability (2)	PV of Cash Inflows (3)	PV of Cash Inflows (2) × (3) = (4)
			0.40	$450,000	$180,000
		$225,000	0.50	200,000	100,000
	Product A		0.10	–100,000	–10,000
			Expected PV of cash inflows		$270,000
Choice A or B					
	Product B		0.20	$320,000	$64,000
		$80,000	0.60	100,000	60,000
			0.20	–150,000	–30,000
			Expected PV of cash inflows		$94,000

For product A:

Expected NPV = expected PV – I = $270,000 – $255,000 = $45,000

For product B:

Expected NPV = $94,000 – $80,000 = $14,000

Based on the expected NPV, choose product A over product B; however, this analysis fails to recognize the risk factor in project analysis.

FIGURE 2.7 Decision tree.

Project Planning and Management Models

- PERT (Program Evaluatioan and Review Technique) untuk planning, schedulling, costing coordinating , complex controlling misal dipakai pada:
  - Formulation of a master budget
  - Construction of buildings
  - Installation of computers
  - Scheduling the closing of books
  - Assembly of a machine
  - Research and development activities

  Questions to be answered by PERT include
  - • When will the project be finished?
  - • What is the probability that the project will be completed by any given
  - time?