1986 - took my first programming course (BASIC)
1987 -1988 - City & Guilds (418) – Introduction to Programming & information processing
1988 – My first job as Computer Programmer (dBase III+)
1989 - 1990 - Enrolled in American Degree Program (Rima College.KL)
Jan 1991 – Ianded in Kansas City International Airport. First time saw snow!
Jun 1992 –Worked as Computer Lab Assistant at NWMSU
May 1993 graduated with B.Sc in Computer Management Systems
Fall 1993 Enrolled in MBA programme at NWMSU in Fall 1993.
Jan 1994, Moved to Knoxville Tennessee, started to work odd jobs
Jun 1994 Worked as Assistant Manager of little Ceaser Pizza
Jan – Dec 1995 - Started MBA program at Lincoln Memorial University, TN,USA
1995 – 1997 Worked as Software developer
1998 – 2001 Return back to Malaysia and started to work as Lecturer at Rima College, JB.
2001 – 2009 Moved to Kerry Ingredients as an IT Executive and same time give part-time lecture
2009 -2011 Move to Universiti Kuala Lumpur
Freelance from 2011 on wards
Own a Computer business and Online Business (UT IT and Management Services) – since 2005
Business Information Systems: An Overview

Presented by
Prasanan Kannan
MBA(USA), B.Sc(USA), City & Guilds (418), IEEE Computer Society
We must dissect the words!

**Business** – A **business** (also known as **enterprise** or **firm**) is an organization engaged in the trade of goods, services, or both to consumers. Businesses are predominant in capitalist economies, where most of them are privately owned and administered to earn profit to increase the wealth of their owners.

**Information** – Data that has been verified to be accurate and timely, is specific and organized for a purpose, is presented within a context that gives it meaning and relevance, and that can lead to an increase in understanding and decrease in uncertainty.

**System** – A **system** is a set of interacting or interdependent components forming an integrated whole or a set of elements (often called *components*) and **relationships** which are different from relationships of the set or its elements to other elements or sets. A system has boundary, behaviour, and interconnectivity.

In order to get the CLEAR picture
Put the knowledge into practice

- Now, each of you think of a system that has Boundary, Behaviour, and Interconnectivity.
- Can be computer-based or otherwise.
- Take 15 minutes to give a thought about it.
- System Boundary same as System Limitation?
Why Do People Need Information?

- **Individuals** – Entertainment and enlightenment
- **Businesses** – Decision making and problem solving
  - Gathering
  - Storing
  - Manipulating
  - Projection
  - Decision Making
Data vs. Information

- **Data**
  - A “given,” or fact: a number, a statement, or a picture
  - The raw materials in the production of information

- **Information**
  - Data that have meaning within a context
  - Raw data or data that have been processed
Data Manipulation

- Example: customer survey
  - Reading through data collected from a customer survey with questions in various categories would be time-consuming and not very helpful.
  - When manipulated, the surveys may provide useful information.
Generating Information
– Computer–based ISS take data as raw material, process it, and produce information as output.
Data, Information, & Systems

- Characteristics of useful information

- Relevant: Information must pertain to the problem at hand. For example, the total number of years of education may not be relevant to a person’s qualifications for a new job. Relevant information might be that the person has so many years of education in mechanical engineering, and so many years of experience. The information must also be presented in a way that helps a person understand it in a specific context.

- Complete: Partial information is often worse than no information. For example, marketing data about household incomes may lead to bad decisions if not accompanied by vital information on the consumption habits of the targeted population.

- Accurate: Erroneous information may lead to disastrous decisions. For example, an inaccurate record of a patient’s reaction to penicillin may lead a doctor to harm the patient while believing that she is helping him.

- Current: Decisions are often based upon the latest information available, but what was a fact yesterday may no longer be one today. For example, a short-term investment decision to purchase a stock today based on yesterday’s stock prices may be a costly mistake if the stock’s price has risen in the interim.

- Economical: In a business setting, the cost of obtaining information must be considered as one cost element involved in any decision. For example, demand for a new product must be researched to reduce risk of marketing failure, but if market research is too expensive, the cost of obtaining the information may diminish profit from sales.
Data, Information, and Systems

What Is a System?

- **System**: A set of components that work together to achieve a common goal
- **Subsystem**: One part of a system where the products of more than one system are combined to reach an ultimate goal
- **Closed system**: Stand-alone system that has no contact with other systems
- **Open system**: System that interfaces with other systems
- **Hybrid system**: Include open and closed systems
Data, Information, and Systems

Sigma Co. Accounting System

Accounts Payable
Whom do we owe?

General Ledger
Our assets and liabilities

Accounts Receivable
Who owes us?

Report Generator
Status, problem areas
Data, Information, and Systems

Farmington High School is one subsystem within the Farmington school system.
Information and Managers

- Systems thinking
  - Creates a framework for problem solving and decision making.
  - Keeps managers focused on overall goals and operations of business.
Hybrid Managers

- Traditional view: Managers are functional specialist with expertise in one area only (i.e. Finance, HR etc)
- Modern business environment requires a multi skilled manager
Hybrid Managers

Hybrid Managers combines management skills and business skills with expertise in the area of IS and IT.

This type of manager is able to undertake a wide variety of roles and can operate across functional areas.
Data, Information, and Systems

- The Benefits of Human–Computer Synergy
  - Synergy
    - When combined resources produce output that exceeds the sum of the outputs of the same resources employed separately
  - Allows human thought to be translated into efficient processing of large amounts of data
  - Conventional formula $\rightarrow 1 + 1 = 2$
  - Synergy Formula $\rightarrow 1 + 1 = 3$ or $1 + 1 = 11$
Qualities of humans and computers that contribute to synergy
In an organization, an information systems consists of:
- Data
- Hardware
- Software
- People
- Procedures
Data, Information, and Systems

The Four Stages of Data Processing

- Input: Data are collected and entered into computer.
- Data processing: Data are manipulated into information using mathematical, statistical, and other tools.
- Output: Information is displayed or presented.
- Storage: Data and information are maintained for later use.
Data, Information, and Systems

- Computer Equipment for Information System
  - Input devices introduce data into the IS.
  - The computer processes data through the IS.
  - Output devices display information.
  - Storage devices store data and information.
Data, Information, and Systems

Input-process-output-storage devices
ISS From Recording Transactions to Providing Expertise

- **Transaction Processing Systems (TPS)**
  - Record data and perform basic processing
    - Cash registers and ATMs

- **Management Information Systems (MIS)**
  - Use recorded transactions and other data to produce information for problem solving and decision making.
ISS  From Recording Transactions to Providing Expertise

- Types of MISs
  - Decision Support Systems (DSS)
    - Contain models, or formulas, that manipulate data into information
    - Often answer “what if?” questions
    - Group Decision Support Systems (GDSS) help groups generate ideas, establish priorities, and reach decisions
ISS From Recording Transactions to Providing Expertise

- Executive Information Systems (EIS)
  - Can gather information from vast amounts of data for high-level executives
  - Highly useful in control and planning
- Expert Systems (ES)
  - Programmed with human expertise
  - Can help solve problems of unstructured nature
Geographic Information Systems (GISS)
• Represents local conditions or features
• Allows planning, decision-making, and monitoring of local conditions or activities

On-demand Output
• Managers can obtain reports tailored to their needs at any time
Information Systems in Business

- ISs in Functional Business Areas
  - Accounting
    - Record business transactions, produce periodic financial statements, and create reports required by law
  - Finance
    - Organize budgets, manage the flow of cash, analyze investments, and make decisions that could reduce interest payments and increase revenues
Information Systems in Business

- Marketing
  - Analyze demand for various products in different regions and population groups
- Human Resources
  - Help with record keeping and employee evaluation
Information Systems in Business

- ISs in Different Business Sectors
  - Manufacturing
    - Allocate resources such as personnel, raw material, and time
    - Control inventory, process customer orders, prepare production schedules, perform quality assurance, and prepare shipping documents
Information Systems in Business

- Government
  - Tax authorities, national insurance and welfare agencies, defense departments, economic organizations, immigration authorities
- Service
  - ISs are often the backbone of service organizations
Information Systems in Business

- **Retail**
  - Some retail stores (e.g., Wal-Mart, Kmart) are now linked to communication networks by satellite.
  - Management can determine which items move quickly and which do not.

- **New Businesses**
  - ISs have made new products and services possible, such as credit reports and shipment tracking.
Shared Data Resources

- Most effective way to operate: different systems share same data from same pool
- Company’s database: one of the most powerful resources
- Categorized and structured data can be manipulated to produce useful information
Computer-based databases are an important resource for any organization
Generalized concept of organization information systems
E–Commerce

- Database management online makes information cheaper to distribute.
- E–commerce is now synonymous with “doing business on the Internet.”
Knowledge Workers
- Employers seek computer-literate professionals who know how to use information technology.

Degrees in IS
- Computer Science and Management Information Systems

Information Systems Careers
- Systems analyst, specialist in enterprise resource planning (ERP), database administrator, telecommunications specialist, consulting, etc.
Ethical and Societal Issues
The Not-So-Bright Side

- **Consumer Privacy**
  - Organizations collect (and sometimes sell) huge amounts of data on individuals.

- **Employee Privacy**
  - IT supports remote monitoring of employees, violating privacy and creating stress.
Ethical and Societal Issues
The Not–So–Bright Side

- Freedom of Speech
  - IT increases opportunities for pornography, hate speech, intellectual property crime, and other intrusions; prevention may abridge free speech.

- IT Professionalism
  - No mandatory or enforced code of ethics for IT professionals—unlike other professions.

- Social Inequality
  - Less than 20% of the world’s population have ever used a PC; less than 3% have Internet access.
Management Information System
Management Information System (MIS)

- Interrelated components that collect, process, store and disseminate information to support Decision Making and Problem Solving
- Information that rely on computer hardware and software for processing and disseminating information
Business Information System

- BIS is one of the resources deployed to help meet the needs of the market by developing and promoting new, innovative products and services that increases the customer value
Any organization strategy can be rooted in 4 areas:

a. Vision
b. Mission
c. Strategies
d. Policies
Vision is an image of a future direction that organization can remember and follow

Mission statement of what the business intends to achieve and what differentiates it from other entities
Strategies is a conditional sequence of consistent resource allocation that defines a organizations relationship with its environment over time

Policies are guidelines and procedures used in carrying out a strategy
Corporate Strategy

A view of the lines of business in which the company will participate and the allocation of resources to each line
SBUs

- Strategic Business Units
- Subsidiaries, divisions and products lines
Each function areas within a business unit must develop a course of action to support its SBU strategy (i.e. marketing strategy and logistic strategy)
E–Business

With the prominence of the concept of e–business and the increased use of business information system (BIS) within an organization, the need for all working professional to have a good knowledge of IS & IT has also increased.

Survey shows that the potential of IS is often not delivered, often due to problems in the management, analysis, design and implementation of system.
The IT architecture of an e-travel agent
E-Payment
Via Maybank
Existing services with Maybank

- M2U (Payment to wallet – Batch processing)

Categorized as Internet Service Provider
# List of Billers

## Internet Service Provider
- Air Zed Networks Sdn Bhd
- Macro Lynx Sdn Bhd
- Jaring Communications Sdn Bhd
- Mobileexec.net
- Metrofon Penangfon
- P1.Com Sdn Bhd
- PayBills Malaysia
- Portfolio Solutions Sdn Bhd
- TM Net Sdn Bhd
- TM Net Sdn Bhd (Internet streaming)

## Leasing/Financing
- AEON Credit Service (M) Bhd
- Borneo Housing Mortgage Finance Bhd
- Malaysia Building Society Berhad
- Di Brothers Motor Station (M) Sdn Bhd
- Seabanc Acceptance Sdn Bhd
- BMV Lease (Malaysia) Sdn Bhd
- BMV Credit (Malaysia) Sdn Bhd
- Toyota Capital Malaysia Sdn Bhd

## Leisure and Travel
- AirAsia

---

[Link to Website](http://www.maybank2u.com.my/consumer/online_bill_payment/monthly_bills/types_bills.shtml#isp)
Online Bill Payment

Payment

Open Payment

Payee Category:
Corporation Name:

Notes:

1. You may register your bills using online payment.

View payee corporations by state.
View payee corporations that accept payments.
View payee corporations that accept credit cards.
Payment

Online Bill Payment

From Account: 
Corporation Name: Ericsson Communications Sdn Bhd
Bill Account No.: Ezy
Amount: 

For each successful transaction RM0.50 will be charged to your account.
Payment

- Bill account no. is 10 digit cust-id
- Payment is checked via check digit
- Payment in batch, next day
- Paid into update at service, terminate at main wallet (to be abolished soon)
- Customer still needs to allocate to service
New Business Prospect

- Selling softpins via M2U and ATM
Other services on Maybank
Online Prepaid

Buy starter packs or reload now for mobile, Internet and IDD/STD prepaid

---

tmnet prepaid – Reload
Internet prepaid reload		Buy reload

Hotlink – RM10 reload
RM10 mobile prepaid reload from Maxis	Buy reload

Hotlink – RM30 reload

---

Next steps
Login now
Already an M2U registered user? Login now

Call us
Got a question? Call our Customer Care hotline at 1-300-88-9950, anytime, any day

Locate us
With close to 400 branches nationwide, getting to us is easy. Find us here

Similar items
Online Ticketing
Services and Denomination

- TMNet prepaid reload (RM 20 for 40 hours)
- Hotlink (10, 30, 60, 100)
- X-Pax (10,30,50,100)
- Digi Prepaid (10, 30, 50, 100)
- Happy (10,30, 100)
- I-Talk (10, 30, 50)
Mobile/Internet Prepaid

From Account: 
Corporation Name: TM Net Sdn Bhd - TM Net Prepaid Reload
Product Type: Internet Prepaid
Amount: RM20 - 40 hours

Note:
This reload purchase is for tmnet prepaid package and not for tmnet prepaid ONE.
TM Net Prepaid

Payment

Mobile/Internet Prepaid

Mobile/Internet Type:  
- Select mobile/internet type
  - 019/013 Celcom Prepaid (Xpax)
  - DiGi Telecom
  - Happy
  - Maxis Hotlink

Note:  
TM Net Sdn Bhd - TM Net Prepaid Reload

Please print the ‘Payment Status’ screen at the end of the transaction for your future reference.
Information Systems within an organization

Business
  Strategy
  Rules
  Procedures

Software

Hardware
  Database

Telecommunications
The productivity paradox – Research results indicating a poor correlation between organization investment in information system and organization performance measured by return on equity
Relationship between Business Strategy and IS/IT Strategy

- Biz Strategy
- Internal Resources Analysis
- Corporate Objective
- Information Strategy
- Information Requirement
- IS Strategy
- IS Strategy Objectives
- IT Strategy
- Micro Environment
- Macro Environment

Information Requirement
7 benefits of IT/IT investment

a. Productivity
b. New Opportunities
c. Change
d. Competitive Advantage
e. Contribution to organization
f. Increased turnover
g. Reduced Risk
7 IS/IT Investment Drivers

- Organizational strategy
- Management decision
- Interfacing (of systems)
- Quality of Service (QoS)
- Evaluation of IS/IT (Tangible and Intangible)
- Business Modeling
- Budget
Information System Costs

- Hardware
- Software
- Installation
- Environment
- Running cost (Operation Costs)
- Maintenance
- Security
- Network
- Training
- Wider organizational cost
Functions of an Information System

Environment

Organization

Information System

Input → Process → Output

Feedback

Customer

Supplier

Regulatory Agencies

Stockholders

Competitor
Functions of an Information System

- **Input** – the collection of raw data for processing information system
- **Processing** – the conversion of data into information for more meaningful
- **Output** – the distribution of processed information
- **Feedback** – output that is returned to help evaluate or correct input
MIS Activities

- **MIS** is activities to manage information for problem solving and decision making in an entity by managed the following activities:
  - Acquiring information by gathering data and processed the data to be the valuable information efficiently
  - Using the information in the most effective way
  - Discarding the information at the proper time
Differences between Data and Information

- Data consists of facts and figures that are relatively meaningless to user. E.g. the number of hours worked for each employee in the company.
- Information is processed data that are more meaningfully. E.g. the hours works for each employee multiplied by the hourly rate, the output information is the gross earning.
Skills required in MIS

1. Computer literacy
   - understanding of computer terminology
   - a recognition of the strength and weakness of the computer
   - an ability to use the computer

2. Information literacy
   - Understanding how to use information at each step of problem solving process
   - Understanding where information can be obtained
   - Understanding how to share information with other
Computer–based information Subsystem

- Electronic data processing (EDP) – produces some information as by product of the accounting process called Accounting Information System (AIS)

- Management information system (MIS) – the computer application should be implemented for the primary purpose of producing management information.
Computer–based information Subsystem

- Decision support system (DDS) – an information producing system aimed at a particular problem that a manager must solve and decision.

- Office automation (OA) – facilities of computer and communication that increase productivities for manager and office worker in conducting their activities

- Expert System (ES) – computer application that can be used by managers in problem solving and decision making
Computer-based information System
Functional Information Subsystem

- Human Resources Information System
- Manufacturing Information System
  - Manufacturing Intelligence Subsystem
  - Industrial Engineering Subsystem
- Financial Information System
- Marketing Information System
  - Marketing Research Subsystem
  - Marketing Intelligence Subsystem
Main Reason interest in MIS

1. Increasing Complexity of Business Activities influenced by:
   • International economic
   • Worldwide Competition
   • Increasing complexity of Technology
   • Shrinking time frames

2. Improving rapidly Computer Capabilities
Information Specialists

- System analyst is an expert who works with user in developing system at defining problems and in preparing written documentation of how the computer will assist in solving the problem.

- Database administrator works with user and system analyst in creating the data needed to produce the information needed by users.
Information Specialists

- Network specialist works with user and system analyst in establishing the data communication network that ties together widespread computing resources.
- Programmers use the documentation prepared by the system analyst to create the software program that lead the computer to transform data into information needed by users.
- Operators operates the computing equipment and using software program.
Information Specialists

BPMS
Applications
Communications
Information Security
Infrastructure & Operations
Organization’s Environment

- All organization operates within an environment that influences the way in which they conduct business
Environmental Influences

Environmental influences can be broken down into
a. Micro environment – The immediate competitive environment which includes customer demands and behaviour, competitor activity, marketplace structure and relationship with suppliers and partners
Environmental Influences

b. Macro environment
Economic developments and regulations by govt. in the form of law, taxes together with social and ethical constraints such as the demand for privacy
7 Modern Management Imperative

a. Reach
b. Reaction
c. Responsiveness
d. Refinement
e. Reconfiguration
f. Redeployment
g. Reputation
Porter & Miller (5 Forces Model)
Aligning IT to Business Strategy

Analysis of Competitive Forces (Porter)

Bargaining power of suppliers
Factors such as degree of supplier concentration and availability of substitute input determine the power that the supplier have over the firms in the industry.

Threat of new entrants
Factors such as economies of scale, brand loyalty and capital requirements determines the degree of which customers are likely to buy substitute products.

Suppliers

Potential Entrants

Industry Competitors

Rivalry among existing firms

Substitutes

Bargaining power of buyers
No of customers in the market, customer information, the availability of substitute determine the degree to which customers are likely to buy substitute products.

Buyers

The goal of competitive strategy is to find a position in the industry where the company can best defend itself against these competitive forces or can influence them in its favour.
Corporate Portfolio Analysis

By Boston Consulting Group
BCG Matrix

- **Star** (high growth, high market share) - prioritize
- **Cow** (high growth, low market share) - invest
- **Question Mark** (low growth, high market share) - prioritize/divest
- **Dog** (low growth, low market share) - kill
**Star**

1. **Stars** (=high growth, high market share)

   - Use large amounts of cash and are leaders in the business so they should also generate large amounts of cash.

   - Frequently roughly in balance on net cash flow. However if needed any attempt should be made to hold share, because the rewards will be a cash cow if market share is kept.
2. Cash Cows (=low growth, high market share)

- profits and cash generation should be high, and because of the low growth, investments needed should be low. Keep profits high

- Foundation of a company
3. **Dog** (low growth, low market share)

- avoid and minimize the number of dogs in a company.

- beware of expensive ‘turn around plans’.

- deliver cash, otherwise liquidate
4. **Question Marks** (= high growth, low market share)
   - have the worst cash characteristics of all, because high demands and low returns due to low market share
   - if nothing is done to change the market share, question marks will simply absorb great amounts of cash and later, as the growth stops, a dog.
   - either invest heavily or sell off or invest nothing and generate whatever cash it can. Increase market share or deliver cash
Stars— Stars represent business units having large market share in a fast growing industry. They may generate cash but because of fast growing market, stars require huge investments to maintain their lead. Net cash flow is usually modest. SBU’s located in this cell are attractive as they are located in a robust industry and these business units are highly competitive in the industry. If successful, a star will become a cash cow when the industry matures.

Cash Cows— Cash Cows represents business units having a large market share in a mature, slow growing industry. Cash cows require little investment and generate cash that can be utilized for investment in other business units. These SBU’s are the corporation’s key source of cash, and are specifically the core business. They are the base of an organization. These businesses usually follow stability strategies. When cash cows loose their appeal and move towards deterioration, then a retrenchment policy may be pursued.
**Question Marks**– Question marks represent business units having low relative market share and located in a high growth industry. They require huge amount of cash to maintain or gain market share. They require attention to determine if the venture can be viable. Question marks are generally new goods and services which have a good commercial prospective. There is no specific strategy which can be adopted. If the firm thinks it has dominant market share, then it can adopt expansion strategy, else retrenchment strategy can be adopted. Most businesses start as question marks as the company tries to enter a high growth market in which there is already a market-share. If ignored, then question marks may become dogs, while if huge investment is made, then they have potential of becoming stars.
Dogs – Dogs represent businesses having weak market shares in low-growth markets. They neither generate cash nor require huge amount of cash. Due to low market share, these business units face cost disadvantages. Generally retrenchment strategies are adopted because these firms can gain market share only at the expense of competitor’s/rival firms. These business firms have weak market share because of high costs, poor quality, ineffective marketing, etc. Unless a dog has some other strategic aim, it should be liquidated if there is fewer prospects for it to gain market share. Number of dogs should be avoided and minimized in an organization.
Limitations of BCG Matrix

- The BCG Matrix produces a framework for allocating resources among different business units and makes it possible to compare many business units at a glance. But BCG Matrix is not free from limitations, such as–

- BCG matrix classifies businesses as low and high, but generally businesses can be medium also. Thus, the true nature of business may not be reflected.

- Market is not clearly defined in this model.

- High market share does not always leads to high profits. There are high costs also involved with high market share.

- Growth rate and relative market share are not the only indicators of profitability. This model ignores and overlooks other indicators of profitability.

- At times, dogs may help other businesses in gaining competitive advantage. They can earn even more than cash cows sometimes.

- This four-celled approach is considered as to be too simplistic.
Database Information System
DBMS Tools
Data Manipulation Subsystem

Find information using the binoculars.

Click here to enter a new record.
DBMS Tools

Data Manipulation Subsystem

- *Report generator* – helps you quickly define formats of reports and what information you want to see in a report.
By following a series of simple screens, you can easily create the report below.

---

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Part Name</th>
<th>Cost</th>
<th>Percentage Markup</th>
</tr>
</thead>
<tbody>
<tr>
<td>1003</td>
<td>50' Tape Measure</td>
<td>$11.90</td>
<td>40.00%</td>
</tr>
<tr>
<td>1005</td>
<td>25' Tape Measure</td>
<td>$9.95</td>
<td>40.00%</td>
</tr>
<tr>
<td>1083</td>
<td>10 Amp Fuse</td>
<td>$0.07</td>
<td>50.00%</td>
</tr>
<tr>
<td>1109</td>
<td>15 Amp Fuse</td>
<td>$0.07</td>
<td>50.00%</td>
</tr>
<tr>
<td>2487</td>
<td>25 Amp Fuse</td>
<td>$0.08</td>
<td>50.00%</td>
</tr>
<tr>
<td>2897</td>
<td>U.S. Socket Set</td>
<td>$29.75</td>
<td>25.00%</td>
</tr>
<tr>
<td>3789</td>
<td>Crimping Tool</td>
<td>$14.50</td>
<td>30.00%</td>
</tr>
<tr>
<td>3982</td>
<td>Claw Hammer</td>
<td>$9.90</td>
<td>30.00%</td>
</tr>
<tr>
<td>4101</td>
<td>Metric Socket Set</td>
<td>$23.75</td>
<td>25.00%</td>
</tr>
<tr>
<td>5908</td>
<td>6&quot; Pliers</td>
<td>$7.45</td>
<td>25.00%</td>
</tr>
<tr>
<td>6743</td>
<td>8&quot; Pliers</td>
<td>$7.90</td>
<td>25.00%</td>
</tr>
</tbody>
</table>
DBMS Tools

Data Manipulation Subsystem

- Query-by-example (QBE) tools – help you graphically design the answer to a question.
DBMS Tools

Data Manipulation Subsystem

The QBE grid

Our selection criteria
Structured query language (SQL) – a standardized fourth-generation query language found in most DBMSs.

The SQL below creates the same report in Figure 3.7 on page 139.

```
SELECT Part.[Part Number], Part.Cost, Employee.[Employee Name], Employee.[Employee Number]
FROM Part, Employee
WHERE ((Part.Cost)>10));
```
Application Generation Subsystem

- *Application generation subsystem* – contains facilities to help you develop transaction-intensive applications.
  - Data entry screens
  - DBMS-specific programming languages
  - Commonly used programming languages
Data administration subsystem – a DBMS helps you manage the overall database environment by providing facilities for backup and recovery, security management, query optimization, concurrency control, and change management.

On Your Own

DBMS Support
OLTP, OLAP, and Information Management
Backup and recovery facilities:
- Periodically back up information contained in a database.
- Restart or recover a database and its information in case of a failure.

Security management facilities – control who has access to what information and what type of access those people have.
DBMS Tools

**Data Administration Subsystem**

- Query optimization facilities – take queries from users and restructure them to minimize response times.

- Reorganization facilities – continually maintain statistics concerning how the DBMS engine physically accesses information.

- Concurrency control facilities – ensure the validity of database updates when multiple users attempt to access and change the same information.
Data Warehouses and Data Mining
What Is a Data Warehouse?

- *Data warehouse* – a logical collection of information – gathered from many different operational databases – used to create business intelligence that supports business analysis activities and decision-making tasks.
Data Warehouses and Data Mining

What Is a Data Warehouse?
Data Warehouses and Data Mining

What Is a Data Warehouse?

- Data warehouses are not transaction-oriented.
- Data warehouses support online analytical processing (OLAP).
Data mining tools – software tools you use to query information in a data warehouse. These tools include:

- **Query-and-reporting tools** – similar to QBE tools, SQL, and report generators in the typical database environment.
- Intelligent agents – use various artificial intelligence tools to form the basis of information discovery and building business intelligence in OLAP.
Data mining tools continued

- **Multidimensional analysis (MDA) tools** – slice-and-dice techniques that allow you to view multidimensional information from different perspectives.
- Statistical tools – help you apply various mathematical models to the information stored in a data warehouse to discover new information.
Data Warehouses and Data Mining

What Are Data Mining Tools?

Query-and-Reporting Tools
Intelligent Agents
Multidimensional Analysis Tools
Statistical Tools

DATA WAREHOUSE ENGINE

As in a DBMS, a data warehouse system has an engine responsible for converting your logical requests into their physical equivalent.
Data Warehouses and Data Mining

Data Marts – Smaller Data Warehouses

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Important Considerations

- Do you need a data warehouse?
- Do all your employees need an entire data warehouse?
- How up-to-date must the information be?
- What data mining tools do you need?
MANAGING THE INFORMATION RESOURCE

Who Should Oversee the Organization’s Information?

- **Chief information officer (CIO)** – responsible for overseeing an organization’s information resource.

- **Data administration** – plans for, oversees the development of, and monitors the information resource.

- **Database administration** – responsible for the more technical and operational aspects of managing the information contained in organizational databases.
As new technologies become available, you should ask yourself whether those technologies will help you organize and manage your information better.

One of the greatest technological changes that will occur over the coming years is a convergence of different tools that will help you better organize and manage information.
Information ownership is a key consideration in today’s information-based business environment.

Ownership refers to who is responsible for information quality.
Managing the Information Resource

What Are the Ethics Involved in Managing and Organizing Information?

- Databases, data warehouses, DBMSs, and data mining tools make it possible for people to easily access all kinds of organizational information.

- How does an organization safeguard against the unethical use of information within the organization?
What is the single most important factor that hinders all organizations in general from providing good online analytical processing (OLAP) support?

Why is it so much easier for organizations to provide good online transaction processing (OLTP) support?
Summary

**Mining Dining Data**

- Consider the issue of timely information with respect to the businesses discussed in the case of a restaurant.

- Which of the businesses must have the most up-to-date information in its data warehouse?
1. Describe business intelligence and its role in an organization.
2. Differentiate between databases and data warehouses with respect to their focus on online transaction processing and online analytical processing.
3. List and describe the key characteristics of a relational database.
4. Define the five software components of a database management system.
5. List and describe the key characteristics of a data warehouse.
6. Define the four major types of data mining tools in a data warehouse environment.
7. List key considerations in managing the information resource in an organization.
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Information Technology
Security
Controls

Controls upon information system are based on 2 underlying principles

a. The need to ensure the accuracy of the data held by the organization
b. The need to protect against damage and loss
Common threats

Faced by organizational information:

a. Accidents
b. Natural disasters
c. Sabotage (industrial and individual)
d. Vandalism
e. Theft
f. Unauthorized used (Hacking)
g. Computer viruses and malware
Also Threats towards information technology

- Non-Intentional threats (and Accidents)
  a. Errors in data entry in programming
  b. Bugs or errors
  c. Accidentally deleting files
  d. Carelessness in performing cautious steps
Intentional Threats

- Computer crimes can occur in many forms.
  - Vandalism
  - Theft
Usage that cannot be validated

- Accessing and modifying or damaging software, hardware, data or any computer network resources
- Exposure of information that is not permitted
- Unauthorized copying/pirating software
- Denial of service (DOS)
- Unauthorized information access (Hacking)
Forms of Computer Crime

- Computer Hacking
  Damage, Steal data/information or program from a system
- Cyber Theft
- Trap Door
  Intrusion into programming code using a certain information technology technique.
- Time & Computer Resource Theft
  Web surfing while on the job
Pirated Software (Illegal Copying)

- Software that is produced and given copyright is an intellectual product protected by law
- Intellectual copyright material
Types of Virus

- Worm
  Software that copies itself instantly and enters a comp tech unit
Trojan Horse

- Illegal s/w that secretly goes into another s/w that is being used by the user
Detecting and Preventing Virus Infection

- Restriction to unauthorized access to machines and software
- Virus Scanner
Salami Slicing

- Undetected theft – stealing 0.00001 sen from individual account
Questions

Where the virus originated and how it spread?
Recovery

- A strategy based upon recovery recognizes that no matter how well defended, a breach in the security of an information system will eventually occur.
- This strategy ensures that normal operation of the information system is restored as quickly as possible.
Recovery

- Development of emergency procedures
- Contingencies for successful recovery
- Disaster recovery – business continuity planning
- Backup and recovery measures
Recovery

- Biometric controls
- Auditing – taking stock of procedures, hardware, software and data at regular intervals
Techniques for controlling IS

- Formal security policies
- Passwords
- File encryption
- Organizational procedure
- Validation techniques
- Backup procedures