Information Systems (IS)

Presented by

M V S V Kiranmai
Assistant Professor (C)
CSE Department,
UCEK, JNTUK

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Data, Information and Systems

- **Data**
  - A “given thing,” or raw fact
  - A number, a statement, or a picture
  - Represents something in the real world
  - The raw materials in the production of information

- **Information**
  - Data that have meaning within a context
  - Data after manipulation
Data Vs Information

- Monthly Sales Report
  - for West Region
  - Sales Rep: Charles Mann
  - Emp No. 79154
  - Item | Qty Sold | Price
  - TM Shoes 1200 $100
Data, Information and Systems contd..

- **System**: A set of components that work together to achieve a common goal.

- A system is a group of interrelated components working together toward a common goal by accepting inputs and producing outputs in an organized transformation process.

- **Subsystem**: A 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.
Systems thinking (Synergy):

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

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
**Information Systems**

- **Why Do People Need Information?**
  - Individuals - Entertainment and enlightenment
  - Businesses - Decision making, problem solving and control

- **Information system:**
  - Set of interrelated components
  - Collect, process, store, and distribute information
  - Support decision making, coordination, and control and provide a feedback mechanism to monitor performance
  - An information system can be any organized combination of people, hardware, software, communications network, and data resources that collects, transforms, and disseminates information in an organization
Information Systems
•General Information Systems Diagram

•Dat a

•Inpu t

•Process t

•Outpu t

•Contro l

•Feedback k

•Information n

•Management Decisions
History of the role of Information Systems

1950-1960
- Data
- Processing
- Electronic Data Processing

1960-1970
- Management
- Reporting
- Electronic Data Processing

1970-1980
- Decision
- Support
- Systems
- Ad hoc Reports

1980-1990
- Strategic
- &
- End User
- Support
- Systems
- Expert Systems
- SIS

1990-2000
- Electronic
- Commerce
- E-Business
- Internetworked

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# Components of an Information System

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Data</strong></td>
<td>Input that the system takes to produce information.</td>
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<tr>
<td><strong>Hardware</strong></td>
<td>A computer and its peripheral equipment: input, output, and storage devices. Hardware also includes data communication equipment.</td>
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<tr>
<td><strong>Software</strong></td>
<td>Sets of instructions that tell the computer how to take data in, how to process it, how to display information, and how to store data and information.</td>
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<tr>
<td><strong>Telecommunications</strong></td>
<td>Hardware and software that facilitate fast transmission and reception of text, pictures, sound, and animation in the form of electronic data.</td>
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<td><strong>People</strong></td>
<td>Information systems professionals and users who analyze organizational information needs, design and construct information systems, write computer programs, operate the hardware, and maintain software.</td>
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<tr>
<td><strong>Procedures</strong></td>
<td>Rules for achieving optimal and secure operations in data processing. Procedures include priorities in running different applications on the computer and security measures.</td>
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Information Systems Activities

- **Input of Data**
  - Manual input by key, scanning, sound, image,…

- **Processing of Data into Information**
  - Calculate, sort, find, report, disseminate……

- **Output of Information Products**
  - Report, display, suggestion, ……

- **Storage of Data Resource**
  - Database, data file, maintenance, ……

- **Control of System Performance**
  - Audit, ……
Input of Data Resources

- Data entry
- Editing
- Machine readable
- Source documents
  - Formal record of a transaction
- User interface
  - How users interact with information system
  - Optical scanning; menu; prompts; fill in blanks
Processing Data into Information

- Calculate
- Compare
- Sort
- Classify
- Summarize
Output of Information

- Transmit information to users
  - Display; paper; audio

- Storage of data
  - Data are retained in an organized manner
    - Fields; records; files; data bases

- Control of system performance
  - Feedback must be monitored and evaluated to determine if the information system is meeting established performance standards
Types of Information Systems

1. Enterprise Systems (ES)

- **Collects** data from different divisions of the firm, firm functions
- **Stores** data in single central data repository for use in firm’s internal business activities
- **Resolves** problem of fragmented, redundant data sets and systems
- Enable:
  - Coordination of daily activities
  - Efficient response to customer orders (production, inventory)
  - Provide valuable information for improving management decision making
2. Management Information Systems (MIS)

- **Combines** computer science, management science, operations research and practical orientation with behavioral issues
- **Provide** answers to routine questions with predefined procedure for answering them
- Typically have little analytic capability
- Serve all levels of management
- Provide reports on firm’s current performance, based on data from TPS
- Provide answers to routine questions with predefined procedure for answering them
- Typically have little analytic capability
3. Customer Relationship Management systems (CRM)

- Provide information to coordinate all of the business processes that deal with customers in sales, marketing, and service to optimize revenue, customer satisfaction, and customer retention.

- Integrate firm’s customer-related processes and consolidate customer information from multiple communication channels.
4. Supply Chain Management (SCM) systems

- Manage firm’s relationships with suppliers
- Share information about
  - Orders, production, inventory levels, delivery of products and services
- Goal:
  - Right amount of products to destination with least amount of time and lowest cost
Management Information Systems (MIS)

- MIS provides managers with information and support for effective decision making, and provides feedback on daily operations.

- Output, or reports, are usually generated through accumulation of transaction processing data.

- Each MIS is an integrated collection of subsystems, which are typically organized along functional lines within an organization.
• AIM of MIS

- Right Information
- To Right Person
- At Right Place
- At Right Time
- In the Right Form
- At Right Cost
Information systems department:

- Formal organizational unit responsible for information technology services
- Often headed by *Chief Information Officer (CIO)*
  Other senior positions include
  - Chief Security Officer (CSO),
  - Chief Knowledge Officer (CKO),
  - Chief Privacy Officer (CPO)
- Programmers
- Systems analysts
- Information systems managers
● **End users**
  - Representatives of other departments for whom applications are developed
  - Increasing role in system design, development
• **Considerations**

• **Security:**
  - Policies, procedures and technical measures used to prevent unauthorized access, alteration, theft, or physical damage to information systems

• **Systems are vulnerable:**
  - Accessibility of networks
  - Hardware problems (breakdowns, configuration errors, damage from improper use or crime)
  - Software problems (programming errors, installation errors, unauthorized changes)
  - Disasters
  - Use of networks/computers outside of firm’s control
  - Loss and theft of portable devices
• **Disaster recovery planning:**
  • Devises plans for restoration of disrupted services

• **Authentication**
  ➢ Password systems
  ➢ Tokens
  ➢ Smart cards
  ➢ Biometric authentication
• Decision Making and Information Systems

• Business value of improved decision making
  ◦ Improving hundreds of thousands of “small” decisions adds up to large annual value for the business

• Types of decisions:
  ◦ Unstructured: Decision maker must provide judgment, evaluation, and insight to solve problem
  ◦ Structured: Repetitive and routine; involve definite procedure for handling so they do not have to be treated each time as new
  ◦ Semistructured: Only part of problem has clear-cut answer provided by accepted procedure
The 4 stages of the decision making process

1. Intelligence
   Discovering, identifying, and understanding the problems occurring in the organization

2. Design
   Identifying and exploring solutions to the problem

3. Choice
   Choosing among solution alternatives

4. Implementation
   Making chosen alternative work and continuing to monitor how well solution is working
Automation

✓ MIS- Computer Based Information System
✓ Increases efficiency
✓ Replaces manual tasks
Some of these reasons for employee resistance may include:

- loss of authority or control
- loss of status or social standing
- lack of faith in their ability to learn new skills
- feeling of change overload (too much too soon)
- lack of trust in or dislike of managers
- loss of job security
- loss of family or personal time
- feeling that the organization is not entitled to the extra effort
Thank You