

Chapter 2 – Information Technology Systems (Supporting Information Processing)

Information technology systems in an organization is composed of three distinct parts:

- (1) An organization
- (2) Information in an organization
- (3) Information technology systems

An organization

At the top is **strategic management**, which provides the overall direction and guidance.

Second level is called **Tactical management**, which develops the goals and strategies outlined by strategic management

Third level is called **Operational management**, which manages and directs the day-to-day operations and implementation of goals and strategies.

Fourth level is called **no management employees** who are those people who actually perform the daily activities.

Dimensions of information include when you need it (time), what information you need (content), and how you want the information (form). You also must consider the following:

1. Concept of shared information through decentralized computing – **decentralized computing** - provides groups of people with the flexibility to handle their own specific information processing tasks. **Shared information** - the placing of all the organization's information in a database and giving people software to (1) provide specific updates to the database and (2) drill down through the database and find any information they may need.
2. Directional flow of information – *upward flow* of information, describes the current state of the organization based on its daily transactions. Information originated at the lowest level and then is passed up through various levels of management. *Downward flow of information* consists of the strategies, goals, and directives that originate at one level and are passed to lower levels. *Horizontal flow* of information, is between functional business units and work teams (new product design, changes, etc)
3. What information specifically describes
Internal information – specific operational aspects of the organization
External information – describes the environment surrounding the organization
Objective information – quantifiably describes something that is known
Subjective information – attempts to describe something that is currently unknown
4. The information-processing tasks your organization undertakes – There are five categories of information processing tasks – capturing, conveying, creating, cradling, and communicating information.

Capturing – Obtaining information at the **point of origin**.

Conveying – Presenting information in its **most useful form** to people who need it.

Creating – Processing information to obtain new information.

⇒ Transaction processing – the processing of transactions that occur within an organization.

⇒ Analytical processing – creating information to support your decision-making tasks.

Cradling – Storing information to use at a later date (retention).

Communicating – Sending information to other people or to another location (telecommunication technologies).

IT SYSTEMS (7)

1. **Transaction-processing Systems (TPS)** – Processes transactions that occur within an organization. Primary information-processing tasks include capturing, creating, and cradling. Secondary information processing tasks include conveying.
2. **Customer Integrated Systems (CIS)** – Places technology in the hands of an organization's customers and allows them to process their own transactions (ATM's). Primary tasks include capturing, creating, cradling, and communicating. Secondary tasks include conveying.
3. **Management Information Systems (MIS)** – Provides periodic and pre-determined reports that summarize information within a database. Primary tasks include creating and conveying. Also called management alerting system because they alert people to the existence of problems or opportunities.

Summarized reports – Aggregate information in some way or form.

Periodic reports – Pre-determined time intervals.

Exception reports – Subset of available information based on some selection criteria.

Comparative reports – Two or more sets of similar information in an attempt to illustrate a relationship.

4. **Workgroup Support Systems (WSS)** – Designed specifically to improve the performance of workgroups by supporting the sharing and flow of information. Primary information-processing tasks include communicating.
Cross-functional teams, project teams, permanent teams. The foundation of WSS is **groupware** – Software component that supports the collaborative efforts of a team.

Groupware contains software that supports the following three functions:

- a. **Team dynamics** – Facilitation and execution of meeting and any communication between team members. **Electronic messaging** – supports the flow of information from one location to another between people. **Electronic meeting support** – component of groupware that helps you schedule meetings and carry out those meetings. **Group scheduling software** – maintains the day-to-day electronic calendars of team members and evaluating those calendars to schedule optimal meeting times. For the actual execution of meeting:
 - ⇒ **Electronic meeting software** – Virtual meetings
 - ⇒ **Videoconferencing software** – Face-to-face meeting when members are geographically dispersed
 - ⇒ **Whiteboard software** – Lets team members meet and interactively edit and share documents.

 - b. **Document management** – A **Group document database** is a powerful storage facility for organizing and managing all documents related to specific teams. GDD's are central to the success of effective team environments.

 - c. **Application development** – Application development facilities constitute a wealth of basic building blocks that you can use to create applications quickly, so that teams can literally “get to work”. **Workflow automation software** is software designed to automate the flow of business documents in a specific work process or procedure.
5. **Decision Support Systems and Artificial Intelligence (DSS/AI)** – Facilitate the processing of information to support decision-making tasks in environments that require significant analysis. Primary tasks include creating.

DSS is a highly flexible and interactive IT system that is designed to support decision-making when a problem is not structured. DSS gives you the ability to (1) perform a series of “what if” analysis to see how inputs affect outputs and (2) use different modelling tools to analyse information.

Geographic Information Systems (GIS) – DSS designed specifically to work with spatial information.

Artificial Intelligence (AI) – Making machines imitate human thinking and behaviour.

Genetic Algorithms – An AI system that mimics the evolutionary, survival-of-the-fittest process to generate increasingly better solutions to a problem. It may use **crossover** to combine two or more steps in an attempt to create a step that yields a better result. **Mutation** involves randomly ordering or combining different steps and evaluating the outcomes. Finally with **selection**, only those steps that produce better outcomes are retained.

Expert Systems – An AI system that applies reasoning capabilities to reach a conclusion.

6. **Executive Information Systems (EIS)** – A highly interactive MIS combined with DSS and AI for helping managers identify and address problems and opportunities. Primary information-processing tasks include creating information through analytical processing and conveying the information to the users.

Key Features of an EIS:

- ⇒ Use of data warehouse – Provides access to all types of information (internal and external)
- ⇒ Drill Down capabilities
- ⇒ Flexible data presentation
- ⇒ Identification of information responsibilities
- ⇒ Use of DSS and AI tools
- ⇒ Access to a variety of information.

7. **Interorganizational Systems (IOS)** – Automates the flow of information between organizations to support the planning, design, development, production, and delivery of products and services. Primary information-processing tasks involve communicating information.

Electronic data interchange (EDI) – Direct computer – to – computer transfer of transaction information contained in standard business documents.

Final Thoughts:

- ⇒ Functional systems are the combinations of the seven IT systems
- ⇒ All Systems perform all five information-processing tasks
- ⇒ Your information-processing needs should drive all your technology decisions.