

Chapter 2: Fundamental Types of Information Systems

Chapter Overview:

Transaction Processing System (TPS)
Management Information Systems (MIS)
Decision Support Systems (DSS)
Office Automation Systems (OAS)
Executive Support Systems (ESS)

1. Development of Information System supporting Management functions

- MIS is a branch of Management that involves the development, maintenance and understanding the CIS from a business perspective.
- MIS has become a crucial function of most organisations today.
- Started with transaction processing (e.g. punch card readers, bar code readers) -> TPS
- MIS development due to business requirement and advance in computer technologies
- Refinement of MIS so that it can support decision making process better ->DSS (past 30 years)
- OAS support communications, improve productivity
- ESS to support specific needs of executives

2. Transaction Processing System

Definition: TPS is an IS that manipulates or transforms symbol such as number and letters for the purpose of increasing their usefulness.

Definition: Transaction processing system is an IS that supports the organisation's daily activities and maintain the majority of the organisation's internal data.

The information is for the firm's management and for individuals and organisations in the firm's environment.

Data is gathered throughout the physical systems and the environment i.e. internal and external sources.

Example

- Telephone call.

The duration, the charge, the destination, the origin are stored. The data processing system of the telecom company will produce a bill, and send it to you.

Data processing tasks:

- Data gathering
- Data manipulation
 - Classifying. Certain data elements in the records are used as codes, so as to identify and group records.
 - Sorting: Arrange in sequence based on code or other data element.
 - Calculating: Arithmetic and logical operations can be performed on the data so as to produce additional data elements.
 - Summarising:
- Data storage
- Document preparation:
 - By an action: outputs are produced when something happens e.g. when customer order arrives
 - By a time schedule: outputs are produced at a particular time e.g. monthly.

Characteristics of TPS:

- Perform necessary tasks
- Adheres to relatively standardized procedures: Data is performed similarly from organisations to organisations.
- Handles detail data with accuracy and high security
- Has a primarily historical focus: Data gathered by the TPS generally describes what happen in the past.

Chapter 2 MIS

- Provide minimal problem-solving information: only some information output has problem solving values to managers e.g. balance sheet, income statements

Example:

- Supermarket

TPS <-> suppliers: purchase orders, shipments, invoices, statements, payment
<-> customers: invoices, statements, payments, sale orders,
<-> management: balance sheet, income statement, budget report, other reports

Roles of TPS in problem-solving

- Produces some standard reports e.g. budget reports, balance sheet
- Provides rich database that can be used in problem solving. It is the foundation upon which other problem-solving systems can be built.

Batch processing and online processing

TPS can process data by batch processing or online processing.

- Batch processing involves holding transactions and processing them all at once in batches.
 - Save storage
 - Improve speed
 - But updated information is not always available.

Examples:

- Update three master files: inventory, account receivable and sale analysis.
 - Inventory file: Sorted information + Old file -> New file
 - Customer file: Sorted information + Old file -> New file
 - Sale analysis file (sale person records): Sorted information + Old file -> New file
- Online processing involves processing the transactions individually other at the time they occur.
Real time systems: a special form of online system with the extension of capability to determine the operations of the physical system. E.g. determine whether the sale should be made by checking credit records.

Exception reports: unusual, unexpected, abnormal activities that may require attention.

3. Management Information Systems (MIS)

Definition: Information system that process information output to help managers and non-managers in the firm in making decisions.

Characteristics:

- MIS is designed to help users of similar needs.
- The information output is about the organisation in terms of what happened in the past, what is happening now, and what is likely to happen in the future

Example: MIS in Marketing consists of subsystems: product, place, promotion, and price

4. Decision Support Systems (DSS)

Definition: DSS is a refinement of MIS that is designed for more specific needs of smaller group of managers.

GDSS is a new feature of DSS that support group decision making process.

Example: MIS in marketing -> predictive capability through simulation.

5. Executive Support Systems (ESS)

Definition: ESS is a system specially built for executives to assist them in making decisions

Example: ESS provides more summarised picture of the whole organisation.

Characteristics:

- provide information that is useful in strategic planning

Chapter 2 MIS

- Information comes from all business activities of organisation.
 - o Marketing Division
 - o Manufacturing
 - o Financial
 - o Human resources

Problem structure

MIS, DSS and ESS are all designed to help managers to deal with problem that are not structured. Structured problems are absolutely well defined problems and steps in solving problems are clear and can be standardised.

Unstructured problems are not well defined and steps in solving problems are not clear and can not be standardised.

Management Structure

- Strategic
- Tactical
- Operational

6. Office Automation Systems (OAS)

Definition: applications of integrated information handling tools and methods to improve the productivity of people in office operations.

Start with IBM in 1960s with the term word processing

Two types of OA

- Computer based OA applications
- Non Computer based OA applications such as video and audio conferencing

Impacts in 2 ways:

- Cost displacement: reduction of cost due to improving productivity i.e. using less labour force for the same amount of work.
- Value adding: improve the value of output e.g. better presentation, adding communication methods.