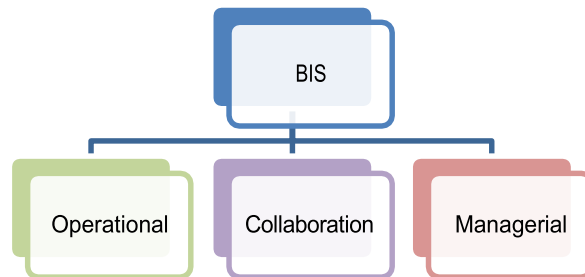# Types of Business Information Systems

Business Information Systems can be divided into three categories: Operational, Collaborative and Managerial. These classifications differ in:

- which employees tends to use the systems in each category, and
- The primary purpose of the systems: input, processing or output.

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                    BIS
        ┌────────────┼────────────┐
   Operational  Collaboration  Managerial
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What are Operational Business Information Systems?

Operational business information systems tend to be used by lower level, non-managerial employees. The focus of operational BIS is on input or data collection. Operational information systems do process and output the data but the processing and output are very, very simple. For example, processing may simply be ordering the data collected. Output is usually just a list of all the data collected. Minimal calculations are performed or output. Often the output or dump of collected data by an operational information system is used as input into an information system with more sophisticated processing capability such as an MIS. Operational BIS include Transaction Processing Systems and Process Control Systems.
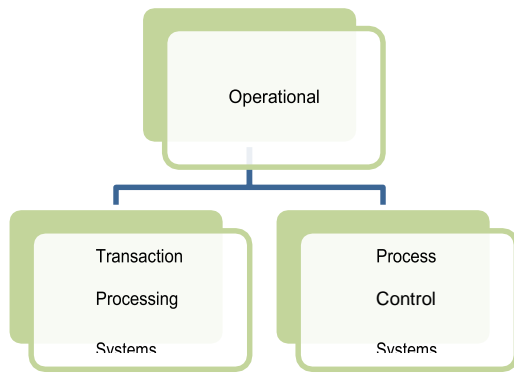
Transaction Processing Systems

- ☐ A transaction processing system performs routine, day-to-day operation of a business that helps a company add value to its products and services.
- ☐ It requires a large amount of input data and produces a large amount of output without requiring sophisticated or complex processing.
- ☐ Examples are, order entry, inventory control, payroll, accounts payable, accounts receivable, and general ledger.
- ☐ An automated TPS consists of all the components of a CBIS such as hardware, software, databases, telecommunication, people, and procedures.
- ☐ A transaction processing system serves the foundation of other systems, such as MIS, DSS, and AI/ES. These systems handle less input and output, but more sophisticated and complex processing.

Transactions Processing Methods

Transactions are commonly performed in batch or on-line.

Batch Processing

- ☐ With batch processing, business transactions are accumulated over a period of time and prepared for processing as a single unit or batch.
- ☐ There is some delay between the occurrence of an event and the processing of the event.
- ☐ Examples are, payroll processing, billing, accounts payable, and accounts receivable.

On-Line/Real-Time Processing (OLTP)

- ☐ With this form of data processing, each transaction is processed immediately, without the delay of accumulating transactions into a batch.
- ☐ As soon as the input data is available, a program performs the necessary processing and updates the records affected by the transaction.
- ☐ Data in an OLTP always reflect the current status.

On-Line Entry with Delayed Processing

- ☐ This type of transaction is a compromise between the batch and on-line processing.
- ☐ With this type of transaction, orders or transactions are entered into the computer system when they occur, but they are not processed immediately.
- ☐ Example: A typical mail order system in which orders are accumulated and then it is forwarded to a warehouse for shipment.

Objectives of Transaction Processing Systems

Because of the importance of the transaction processing system, organizations expect their TPSs to accomplish a number of specific objectives.

Process data generated by and about transactions

- ☐ The primary objective of any TPS is to capture, process, and store transactions and to produce a variety of documents related to routine business activities.
- ☐ Processing orders, purchasing materials, controlling inventory, billing customers, and paying suppliers, result in transactions that are processed by a TPS.

Ensure data and information integrity and accuracy

- ☐ One objective of any TPS is error-free data input and processing.
- ☐ Rules must be in place and implemented in the programming to ensure data accuracy before it is stored.
- ☐ Another of a TPS is to ensure that all data and information stored in the file or database are accurate, current, and appropriate.

Produce timely documents and reports

- ☐ Transaction processing systems produce routine documents such as order slip, shipping order, invoice, purchase order, inventory status report, inventory on-hand report, customer list, paycheck, and so on.
- ☐ These documents need to be produced in timely manner to perform routine business transactions.

Increase labor efficiency

- ☐ Transaction processing system can substantially reduce routine clerical and other labor requirements.
- ☐ An automated scanning device in a retail store can substantially reduce the item processing time. This not only increases checkout efficiency but also a reduction of the manual workforce.

Help provide increased and enhanced service

- ☐ TPSs can provide services faster than humans, thus increasing the number and varieties of services it can offer to customers.
- ☐ Examples are, automated university registration system, automated billing inquiries, automated bank account transfers, and so on.

Help build and maintain customer loyalty

- ☐ TPS can be used to build customer loyalty.
- ☐ Examples are, ease of use of the system, easy access of customer account, timely reporting of information, automated telephone answering and faxing, and web-based information processing, can help satisfy customers.

Achieve competitive advantage

- ☐ **A competitive advantage provides a significant and long-term benefit for the organization.**
- ☐ **For example, UPS and FedEx systems keep track of a package at each stage of its traversal. Customers can use a tracking number to find the latest status of the package.**
- ☐ Some of the ways that companies can achieve competitive advantage are mentioned below.

Transaction Processing Cycle

The business data goes through a transaction processing cycle that includes:

- **Data Collection**
- **Data Editing**
- **Data Correction**
- **Data Manipulation**
- **Data Storage**
- **Document Production**
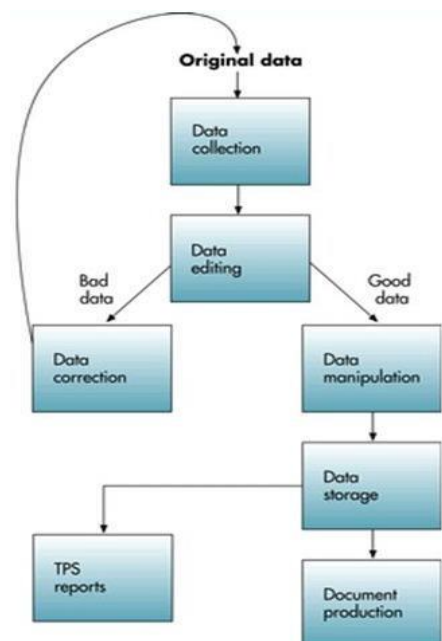
These are briefly described in the following.

Data Collection

- **The process of capturing and gathering all data necessary to complete transactions is called data collection.**
- It can be manual such as completing a purchase order by hand. It can also be automated via special input device such as scanners and terminals.
- Data collection begins with a transaction (such as customer order) and results in the origination of data that is input to the transaction processing system.
- Data should be captured at its source and it should be recorded accurately, in a timely fashion, with minimal manual effort, and in a manner that can be directly entered to the computer rather than entering using keys.
- Automatic data collection is termed as *source data automation*. An example is the use of scanning device at the grocery store to read UPC code and hence the price of an item. Another example is an employee badge used as a time card when going in and out of an office building.

Data Editing

- An important step in processing data is to check for validity and completeness of data. Controls must be placed in the data-entry form.
- For example, quantity and cost must be numeric and names must be alphabetic.

Data Correction

- A data that is not entered properly needs to be entered correctly.
- Data correction involves reentering miskeyed or misses scanned data in the data entry point.
- For example, a UPC code not found in the retail store checkout is given a special code to complete the transaction for an item.

Data Manipulation

- The process of performing calculations and other data transformations is termed data manipulation.
- Examples are, sorting data, summarizing data, finding price of five items, calculating employee weekly pay, and so on.

Data Storage

- Involves updating one or more database tables or files with new transactions.
- For example, inserting new customer information, updating customer demographics, updating inventory transactions, creating new student registration, and so on.

Document Production

- TPSs produce important business documents such as sales receipts, order entry list, customer list, invoices, purchase orders, inventory on-hand report, paychecks, and so on.
- Documents can be hard copy paper report or displayed on computer screen.

Process Control Systems

Process Control Systems or PCS are used for constant monitoring. PCS are often used to monitor some aspect of the environment. Again, the focus is on input: get the current reading. Processing is very simple: comparing the current reading to preset boundaries. Output is also very simply: sound a warning if current reading is outside preset boundaries. For example, a PCS may monitor the quality of water in a holding pond at a water treatment plant. If pollutants exceed a predetermined number of parts per million gallons, the PCS may sound an alarm. Sometimes, PCS's may be able to adjust other equipment in an attempt to bring the environment back into acceptable ranges. A PCS is not activated as a result of an activity or transaction. A PCS is turned on and stays on. It constantly monitors something. In a generic sense, all information systems monitor something because all information systems collect data about something, but we are not speaking generically here. Some students get confused and think EVERY information system is a PCS. For example, they wrongly conclude that since the Registrar has information systems that track their progress toward their degree, the Registrar has a PCS. The Registrar, however, has not implanted a tracking device on your person. The Registrar does not know your academic progress every second of every day since your enrollment. The Registrar does not sound an alarm because you arrive to class late or forget to complete a homework assignment. The Registrar will have little idea of how you are doing in this course until the end of the semester when I report final grades. The Registrar does not have a PCS even though it does collect data about your academic progress. A PCS knows the current status of the object it is monitoring every second of every day that the system is up and running.

What are Collaboration Business Information Systems?

Collaboration business information systems are used by all levels of employees. As the name implies, collaboration BIS supports the efforts of groups of employees working to achieve common goals. Collaboration BIS are a little different than the Operational and Managerial categories in that the focus is not more on input, processing or output. Also Collaboration BIS sub-categories tend to build on each other rather than adhere to distinct divisions. Collaboration BIS are categorized into three levels: Communication, Content Management and Workflow Control.
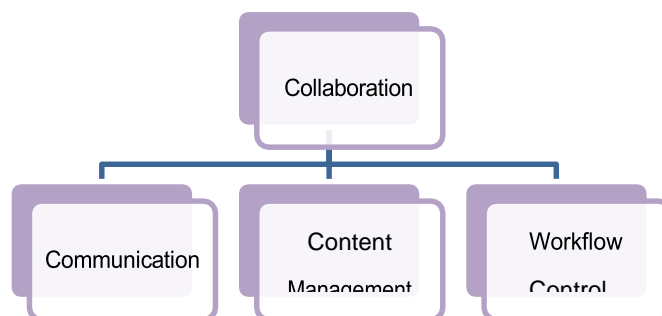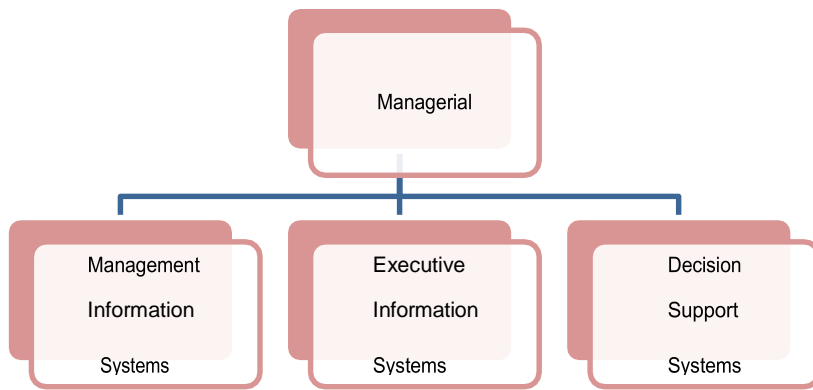
Communication systems support the transfer of data among workgroup members. The focus is not on just one component; input, processing or output. Instead, all components are optimized for quick and easy exchange of data. You have probably used Communication BIS extensively. Email and instant messaging are examples of Communication BIS. Video conferencing and programs like Skype are also Communication BIS.

Content Management systems focus on keeping track of the documents that team members share and making those documents available to the entire team quickly and easily. Content Management systems will have capabilities that allow multiple users to add, change and delete content from various types of documents like word processed documents, spreadsheets, databases and presentations. Document manipulations are made available to the entire workgroup instantly. Content Management systems can also keep track of various versions of the document noting the exact changes, which made the change, when the change was made and any notes made about the change by the author. Such an audit trail makes it easy to revert to previous versions of the document. Wiki's such as Wikipedia are considered Content Management systems. Google Docs is a free Internet-based Content Management system. Groove is part of the Microsoft Office Suite you purchased and is also Content Management software. You could use Google Docs or Groove the next time you have to produce a group term paper or presentation. Content Management systems often include communication capabilities along with the document control features.

Workflow Control systems take a broader view of teams than just the documents they produce. Workflow Control systems try to support the activities teams must engage in to achieve their goal whether it results in the production of a document or not. Workflow Control systems focus on shared scheduling. Who is responsible for each task in the project? When should each task be performed? What is the status of each task? Microsoft SharePoint is an example of a Workflow Control System. Workflow Control BIS may also include content management and communication features.

What are Managerial Business Information Systems?

Managerial BIS are used primarily by middle and upper level managers. The focus of Managerial BIS is output and the processes necessary to produce the output. Managerial BIS include Management Information Systems, Executive Information Systems, and Decision Support Systems.

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                    ┌─────────────┐
                    │  Managerial  │
                    └─────────────┘
          ┌───────────────┼───────────────┐
   ┌─────────────┐ ┌─────────────┐ ┌─────────────┐
   │ Management   │ │ Executive    │ │ Decision     │
   │ Information  │ │ Information  │ │ Support      │
   │ Systems      │ │ Systems      │ │ Systems      │
   └─────────────┘ └─────────────┘ └─────────────┘
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Management Information Systems (MIS)

The MIS has more than one definition, some of which are given below:

☐ The MIS is defined as the system that provides information support for decision making in the organization.

☐ The MIS is defined as an integrated system of man and machine for providing the information to support the operations, the management and the decision making function in the organization.

☐ The MIS is defines as the system based on the data base of the organization evolved for the purpose of providing information to the people in the organization.

☐ The MIS is defines as a Computer-based Information System.

Role of Management Information System

The role of MIS is an organization that can be compared to the role of heart in the body.

☐ The system ensures that an appropriate data is collected from various sources processed, and then further sent to individuals, group of individuals or the management functionaries: the managers and the top management.

☐ It satisfies diverse needs through a variety of systems such as Query Systems, Analysis Systems, Modeling Systems and Decision Support System. MIS contributes to Strategic Planning, Management Control, Operational Control and Transaction Processing.

☐ It helps Clerical personnel in the transaction processing and answers the queries on the data pertaining to the transaction, the status of a particular record and references on a variety of documents.

☐ It helps Junior management personnel by providing the operational data for planning, scheduling and control, and helps in decision making at an operational level to correct an out of control situation.

☐ It helps Middle-Level management in short term planning, target setting and controlling the business functions.

☐ It helps Top management in goal setting, strategic planning and evolving the business plans and their implementation.

☐ It plays an important role in information generation, communication, problem identification and helps in the process of decision making

Thus, MIS plays a vital role in the management, administration and operations of an organization.

* An MIS provides managers with information and support for effective decision making, and provides feedback on daily operations.
* A manufacturing MIS can help managers monitor a manufacturing process to maximize the value to processes within an organization.
* Information is provided to managers through various *summary reports* that 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.
* Thus, a financial MIS includes subsystems that address financial reporting, profit and loss analysis, cost analysis, and the use and management of funds.
* The architecture of an MIS is shown below.