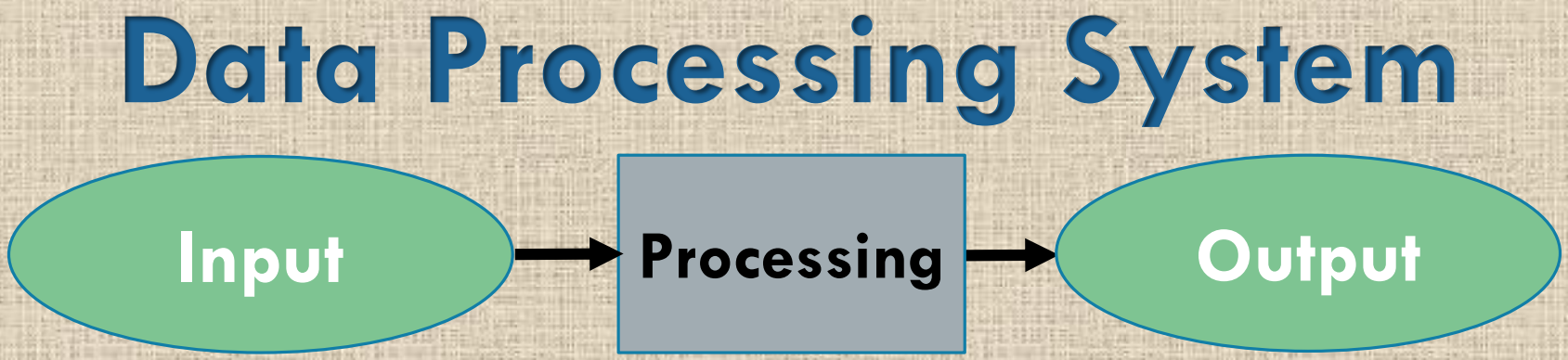
LECTURE 16

DATA PROCESSING | Part 2

DATA PROCESSING SYSTEM

A group of interrelated components that seeks the attainment of a common goal by accepting inputs and producing outputs in an organized process is called a System.

From this point of view, the complete data processing cycle can be described as a data processing system as it takes data as input and after processing it generates information as output.



DATA PROCESSING SYSTEM

Data processing method depends upon following factors:

- Volume of data to be processed
- Complexity of the whole operation
- Computational demands
- Processing time constraints
- Economic factor

DATA PROCESSING SYSTEM

According to the method involved, there are various electronic data processing systems. Some of them are:

- The Single User System
- Batch Processing
- Online Processing
- Real Time Processing
- Distributed Processing

DATA PROCESSING SYSTEM:
THE SINGLE USER SYSTEM

- It is a “one man show”-means one person can work with the database at any given time.
- If others have to work with the database, they have to wait for the computer to be vacant.
- Even if the database file is kept in a file server, due to the lack of multiple access facility, others have to wait till the person stops using that file.

This system is budget friendly and only suitable for organizations where few employees use data processing for less amount of data.

DATA PROCESSING SYSTEM:
BATCH PROCESSING SYSTEM

Batch processing system is suitable for large volume of data for which real time processing is not necessary and suitable periodic processing works just fine.

In a batch processing system, separate programs are used to collect input, process data and present output. The elements of this cycle are:

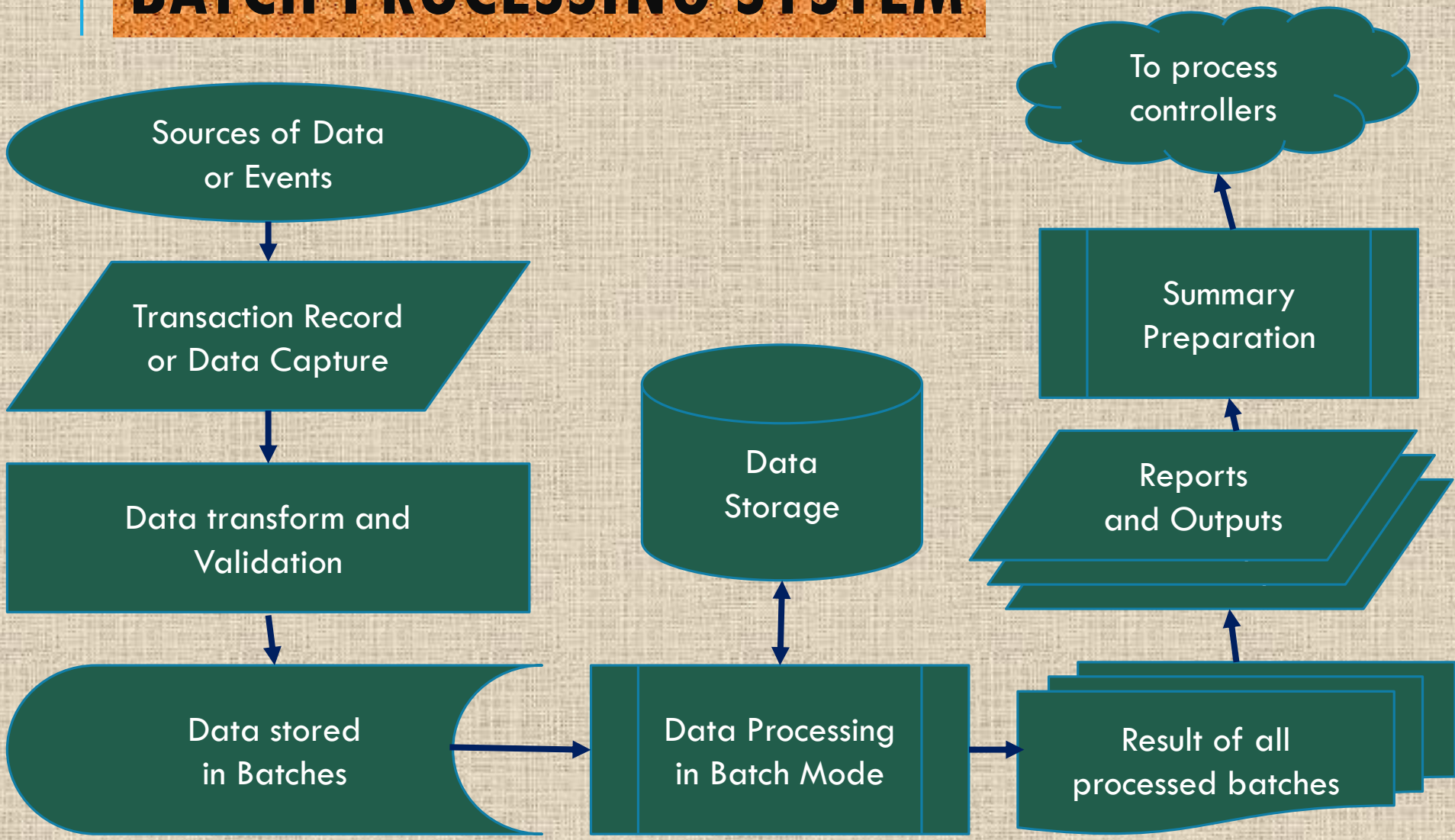
i. Data capture
ii. Data transform
iii. Data validation
iv. Data batch preparation
v. Input of data in batches to processor
vi. Preparation of reports/results for individual batch

DATA PROCESSING SYSTEM:
BATCH PROCESSING SYSTEM

In this system the source transaction documents are first collected before being sent to the data processing system. All the organized accumulated data which will be entered at a time is called a batch of input and a single batch is put into the system, processed and output for that batch is generated.

In this method, batches of data inputs are validated before processing to find potential error. Because it is difficult to perform debugging and error correction after the processing is done. There is a significant time gap between the moment of data capture and report generation. The time gap depends upon the periodicity (a day, a month, etc.) of the organization.

DATA PROCESSING SYSTEM:
BATCH PROCESSING SYSTEM



DATA PROCESSING SYSTEM:
BATCH PROCESSING SYSTEM

Applications of Batch Data Processing

- ✓ Payroll Processing
- ✓ Utility Billing System
- ✓ Financial Accessing
- ✓ Budgeting and Budget Implementation
- ✓ Production Planning and Control
- ✓ Project Planning and Control

DATA PROCESSING SYSTEM:
ONLINE PROCESSING SYSTEM

Online processing refers to the processing of individual transactions immediately as they occur from their point of origin. There is no data accumulation in batches and there is no time gap between the generation of input data and output report.

Online processing as it name implies is implemented by the network of terminals (data and query source) and the data processor (a mainframe or at least a work station). The network can be a LAN or can be even a WAN using public network.

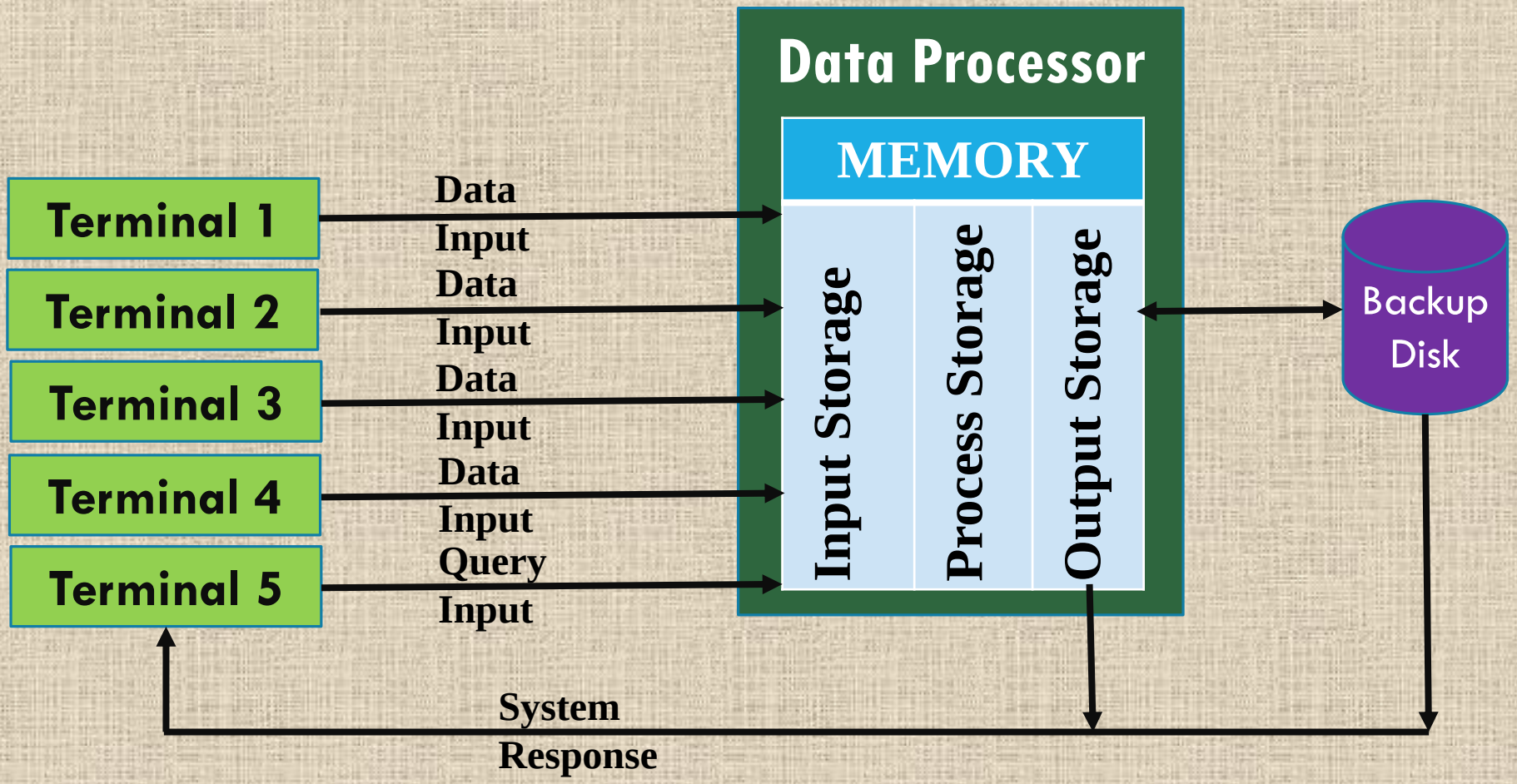
This method supports multiple users of the database simultaneously with proper authentication.

DATA PROCESSING SYSTEM:
ONLINE PROCESSING SYSTEM

Special Features

- No data accumulation, immediate input with instant result.
- Supports distant users working (providing data or query) from their terminals.
- Reduced data errors because the input is given by the person who actually recorded or captured the data first hand.
- This method not just relies on users' trustworthiness but also implements data validation at various points.
- In online processing, one has the latest update immediately.

DATA PROCESSING SYSTEM:
ONLINE PROCESSING SYSTEM



DATA PROCESSING SYSTEM:
ONLINE PROCESSING SYSTEM

Applications of Online Processing

Banking: Bank's central database can be modified simultaneously from any branch or ATM location as transactions take place. Customers can even place their query to get feedback from data server from any location with proper authentication.

Stock Exchange: Clients can take help from stock brokers and their computers (in this case the terminals that is accessing stock market database) in brokerage house to check, buy and sell stock market share. At present it is possible to do all these from any location through the brokerage house terminal using VPN.

DATA PROCESSING SYSTEM:
ONLINE PROCESSING SYSTEM

Applications of Online Processing

Inventory Management: Terminals located in warehouse provide the means for automatic recording of stock, updating of inventory records, reservation for shipping, preparation of periodic shipped product list and follow-up of outstanding orders.

Tour Operation and Reservation: Tour operators or even tourist can book for room beforehand and can do the reservation of airline, train and bus tickets anytime for their upcoming tour. Upon availability, these booking and reservation are confirmed and even sometimes facilitate online advance payment.

DATA PROCESSING SYSTEM:
ONLINE PROCESSING SYSTEM

Benefits of Online Processing System

Integration of clerical works with the computer: As processed information and answer to any query are available to any employee sitting before the terminal that has access to the data center, it becomes easier to serve the customers resulting in better efficiency.

Elimination of tedious tasks: Without online data processing, employees had to perform regular manual checking and had to give frequent feedbacks to maintain integrity of their operation. Online processing automates everything eliminating all these tedious tasks.

DATA PROCESSING SYSTEM:
ONLINE PROCESSING SYSTEM

Benefits of Online Processing System

Reduction in paper works: Online data processing automates all the transaction recordings, processings and generates result and feedback to query in electronic form eliminating lots of paper work.

Improved accuracy: Data validation, automatic error checks and zero involvement of human during complex processing and calculation improve the accuracy of information in online data processing system.

Improved file updating: Master file is updated keeping tracks of the changes during update allows us to correct for any bad or missing transactions.

DATA PROCESSING SYSTEM:
ONLINE PROCESSING SYSTEM

Benefits of Online Processing System

Management information availability: Because of direct access facility to all the processed information, managers have greater degree of control over the operations.

Improved customer service: Ease of access to the remote database for any query improves the level of customer service.

Reduced data preparation cost: Online processing reduces paper works, keeps human intervene at minimum and provides lucrative data presentation forms which are automatic. All these save time and reduce cost.

DATA PROCESSING SYSTEM:
REAL TIME PROCESSING SYSTEM

Real time processing is an interactive and direct mode as it is used to control processes where constant feedback from the system is required to adjust process variables.

Real time data processing may sound like online data processing but it has its distinction as in this mode the output is the feedback which is required as the input to control the process with better accuracy. And to do that, there is essentially no waiting period between the moment data is available at input and result is available at output after processing.

DATA PROCESSING SYSTEM:
REAL TIME PROCESSING SYSTEM

Special Features

- Program is always under execution.
- It produces output which is fed back to control, direct or affect the outcome of an ongoing activity or process.
- The control or human intervene is exercised during the functioning.
- As it has to give results based on deadline and time constraints which are imposed by the real world outside, it is hence called real time data processing system.
- The data which has to be produced by the system has to be prepared in such a less time that they can influence the external events which are based on this data.

DATA PROCESSING SYSTEM:
DISTRIBUTED PROCESSING SYSTEM

Distributed data processing is a form of data processing in which work is performed by separate computers that are linked through a communication network.

The network of distributed processing is made of several remote stations all linked to a single host computer. The larger host computer stores the master database and during processing splits the task and distribute it among the stations connected to it.

This processing system can further categorized into two classes:

a. Plain Distributed Processing
b. True Distributed Processing

DATA PROCESSING SYSTEM:
DISTRIBUTED PROCESSING SYSTEM

In a plain distributed system, the computers can communicate with one another to share work load according to their capability or availability. Block-chain processing during data mining can be good example of this.

In true distributed processing, the whole system relies on the synchronization of the hardware and software so that all together they can complete their task to achieve a common goal. Assembly line, branch offices of large e-commerce organizations and payment handling networks like Visa, Mastercard are examples of true distributed systems.

DATA PROCESSING SYSTEM:
DISTRIBUTED PROCESSING SYSTEM

Advantages

- Local computers on the network offer immediate response to local needs.
- Systems can be expanded in modular fashion as per requirement because many small computers are used in a network.
- The system can be designed to be independent of large unit that could shutdown the network if it fails.
- Hardware and management cost are often lower.

DATA PROCESSING APPLICATION IN BUSINESS

Let's conclude our data processing topic by summarizing all the application of it in business organization.

1. **Process Control:** Computer doing real time data processing connected to a plant can monitor and control the whole production process doing quality and throughput control.
2. **Accounting:** Preparation of journal, balance sheet, ledger, various account and statement is now automated in every organization.
3. **Payroll Preparation:** Data processing system is used to record shifts and leaves taken by employees. And then payroll is prepared in batches by performing all the calculations and necessary deductions for every employee from all the departments of an organization.

DATA PROCESSING APPLICATION IN BUSINESS

4. **Sales Analysis:** Data processing is highly useful in sales analysis. Forecasting can be done by doing analysis on previous sales record and taking in consideration of any variable that can affect future sales. Thus actions like inventory management, production rate, imports, etc. can be adjusted.
5. **Inventory Management:** Data processing is used to keep track of inventory, product shelf life, shipping order, outstanding order, etc. to effectively manage large inventory effectively.
6. **Office Automation:** The modern offices and business organizations are dependent upon computer based office automation for their better management and competitiveness.

DATA PROCESSING APPLICATION IN BUSINESS

7. **Banking and Insurance:** To provide quick service keeping integrity of master database, online data processing is a must for banks. Branch or ATM, non-stop banking service is the outcome of network based online transaction handling capability of modern banking system.
8. **Stock Market:** Computerized online data processing system capable of handling large volume of data during transaction hour is the heart of stock market. Calculation of stock price in real time, updating clients' ledger with every transaction, calculation of brokerage fee- all these are done in no time in online data processing mode.
9. **Managerial Aid:** We have a full chapter ahead to discuss this one.

Stay Home, Stay Safe

Always put on a mask when you are in public!