Different types of Business Information Systems

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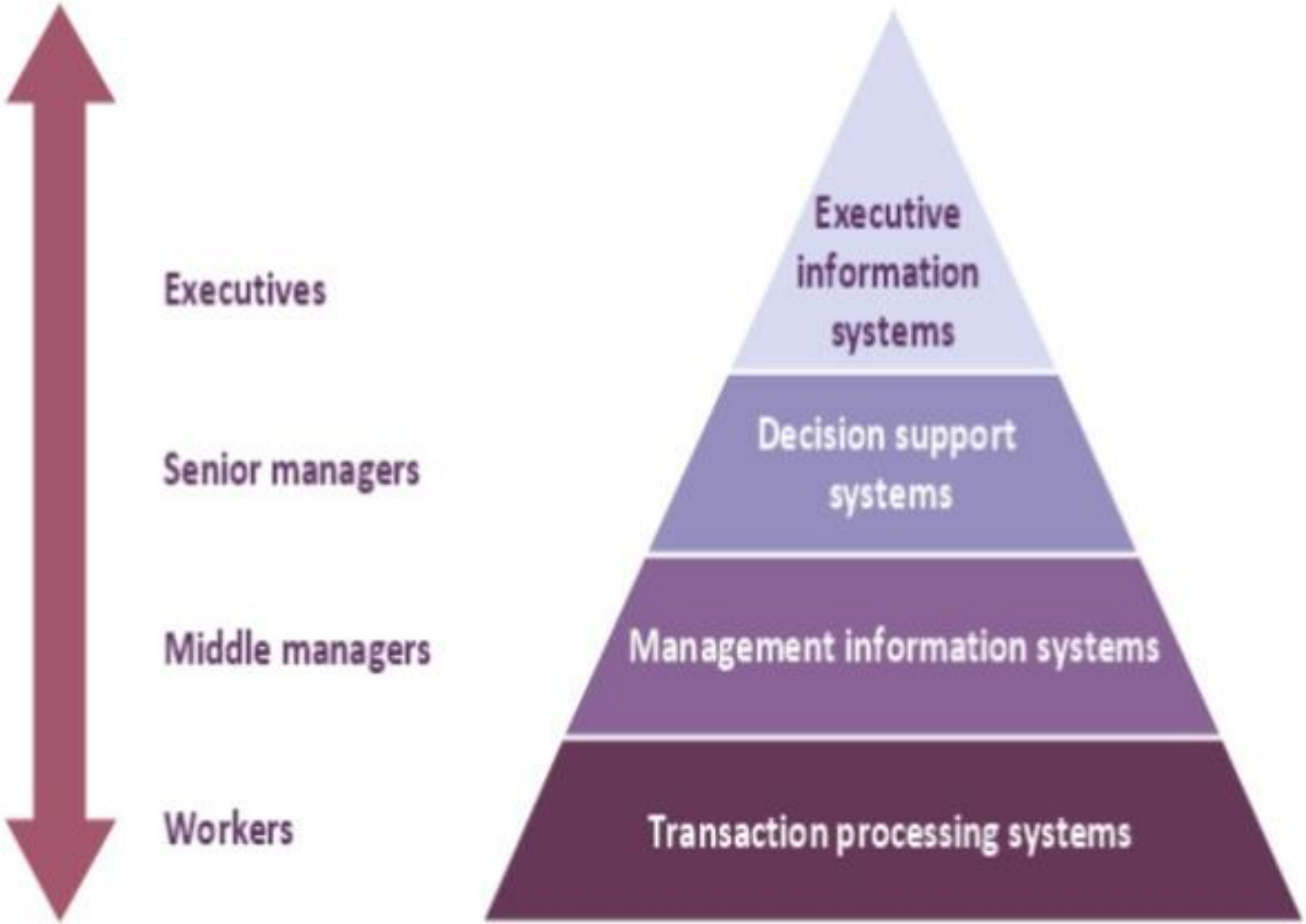
Different types of Business Information Systems

- Transaction Processing System (TPS)
- Management Information Systems (MIS)
- Decision Support Systems (DSS)
- Other
  - Supply Chain Management Information Systems

Learning Objectives

- Identify basic alternatives and business objectives common to all transaction processing systems.
- Explain some key control and management issues associated with a TPS.
- Identify the inputs and outputs of different types of TPSs.
- Define the term MIS and clearly distinguish the difference between a TPS and a MIS.
- Describe the inputs and outputs associated with different types of MIS.


Executives
Senior managers
Middle managers
Workers
Executive information systems
Decision support systems
Management information systems
Transaction processing systems

Group Work

- Form Groups
- Explore on “Transaction Processing Systems”.
- Formulate (5) Questions and the corresponding answer.

What is Transaction Processing System(TPS)

- An information processing system for **business transactions** involving the **collection, modification and retrieval** of **all transaction data**.

  e.g. airline reservation systems, electronic transfer of funds, bank account processing systems.

- Designed to process routine business transactions

What is a Transaction?

- A business activity between seller and buy to exchange an asset.
- Basic business operations such as customer orders, purchase orders, receipts, invoices, and payroll checks in an organization.
- Business transaction does not have to involve MONEY. Data is the KEY.

Types of Transactions

- Internal Transactions
  - transactions, which are internal to the company and are related with the internal working of any organization.
  - when a department orders office supplies from the purchasing department, an internal transaction occurs.
  - e.g. Shipped orders, purchase orders, employee time cards
- External Transactions
  - transactions, which are external to the organization and are related with the external sources.
  - when a customer places an order for a product, an external transaction occurs.
  - e.g. Customer orders, vendor invoices, customer payments (sales, purchase etc)

TPS Qualifiers (ACID Test)

- Atomicity
  - A transaction is either completed in full or not at all.
  - e.g. if funds are transferred from one account to another, this only counts as a transaction if both the withdrawal and deposit take place.
  - If one account is debited and the other is not credited, it does not qualify as a transaction. TPS systems ensure that transactions take place in their entirety.
- Consistency
  - TPS systems exist within a set of operating rules (or integrity constraints). If an integrity constraint states that all transactions in a database must have a positive value, any transaction with a negative value would be refused.
- Isolation
  - Transactions must appear to take place in isolation.
  - e.g. when a fund transfer is made between two accounts the debiting of one and the crediting of another must appear to take place simultaneously. The funds cannot be credited to an account before they are debited from another.
- Durability
  - Once transactions are completed they cannot be undone. To ensure that this is the case even if the TPS suffers failure, a log will be created to document all completed transactions.

These four conditions ensure that TPS systems carry out their transactions in a methodical, standardized and reliable manner.

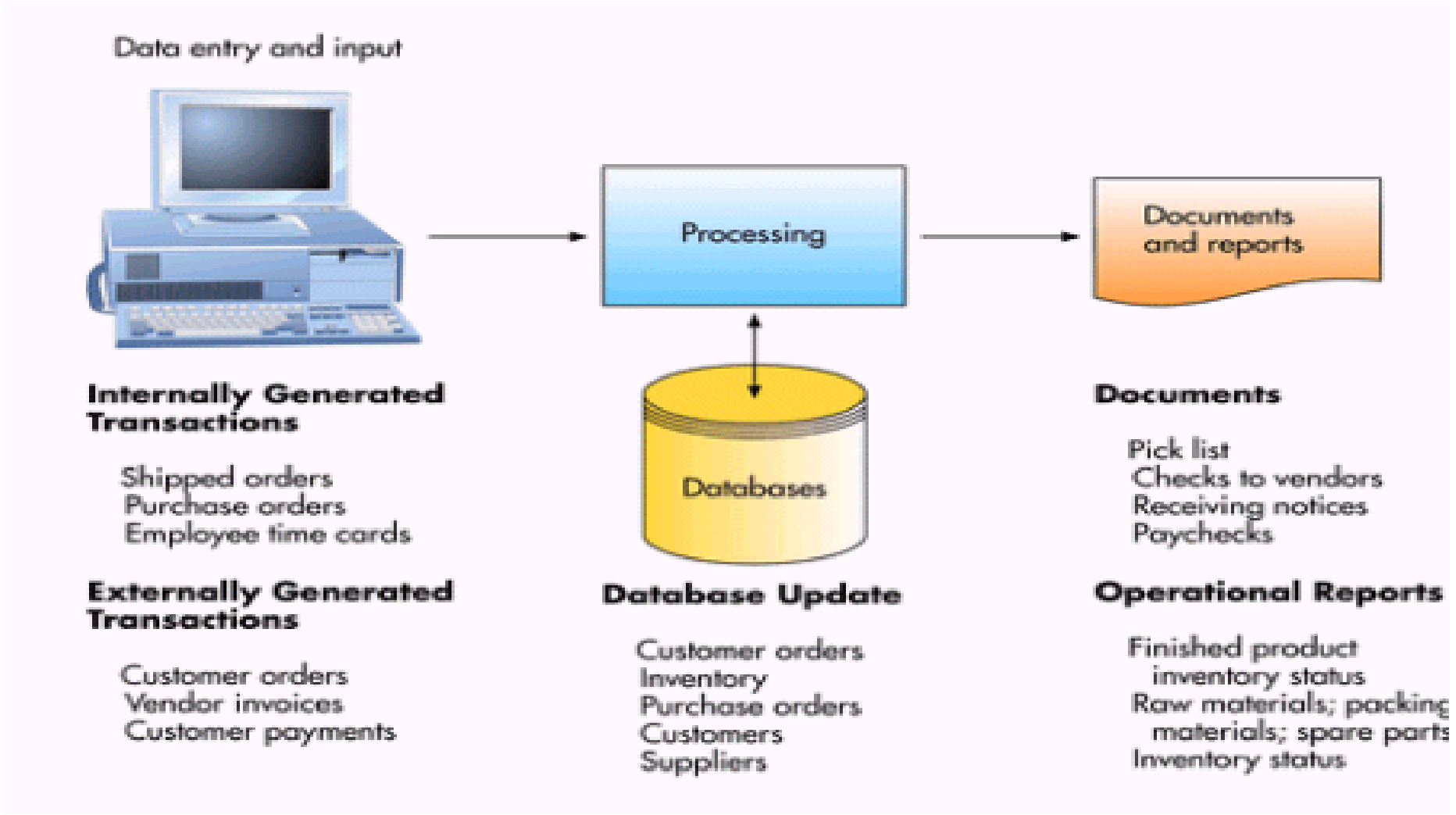
Features of Transaction Processing Systems

- Rapid response:
  - Fast performance with a rapid response time is critical. Transaction processing systems are usually measured by the number of transactions they can process in a given period of time.
- Continuous Availability:
  - The system must be available during the time period when the users are entering transactions. Many organizations rely heavily on their TPS. A breakdown will disrupt operations or even stop the business.
- Data Integrity:
  - The system must be able to handle hardware or software problems without corrupting data. Multiple users must be protected from attempting to change the same piece of data at the same time, for example two operators cannot sell the same seat on an airplane.
- Ease Of Use:
  - Often users of transaction processing systems are casual users. The system should be simple for them to understand, protect them from data-entry errors as much as possible, and allow them to easily correct their errors.

Components of TPS

- Consist of all the components of a CBIS
  - Databases,
  - Telecommunications,
  - People,
  - Procedures,
  - Software and Hardware.

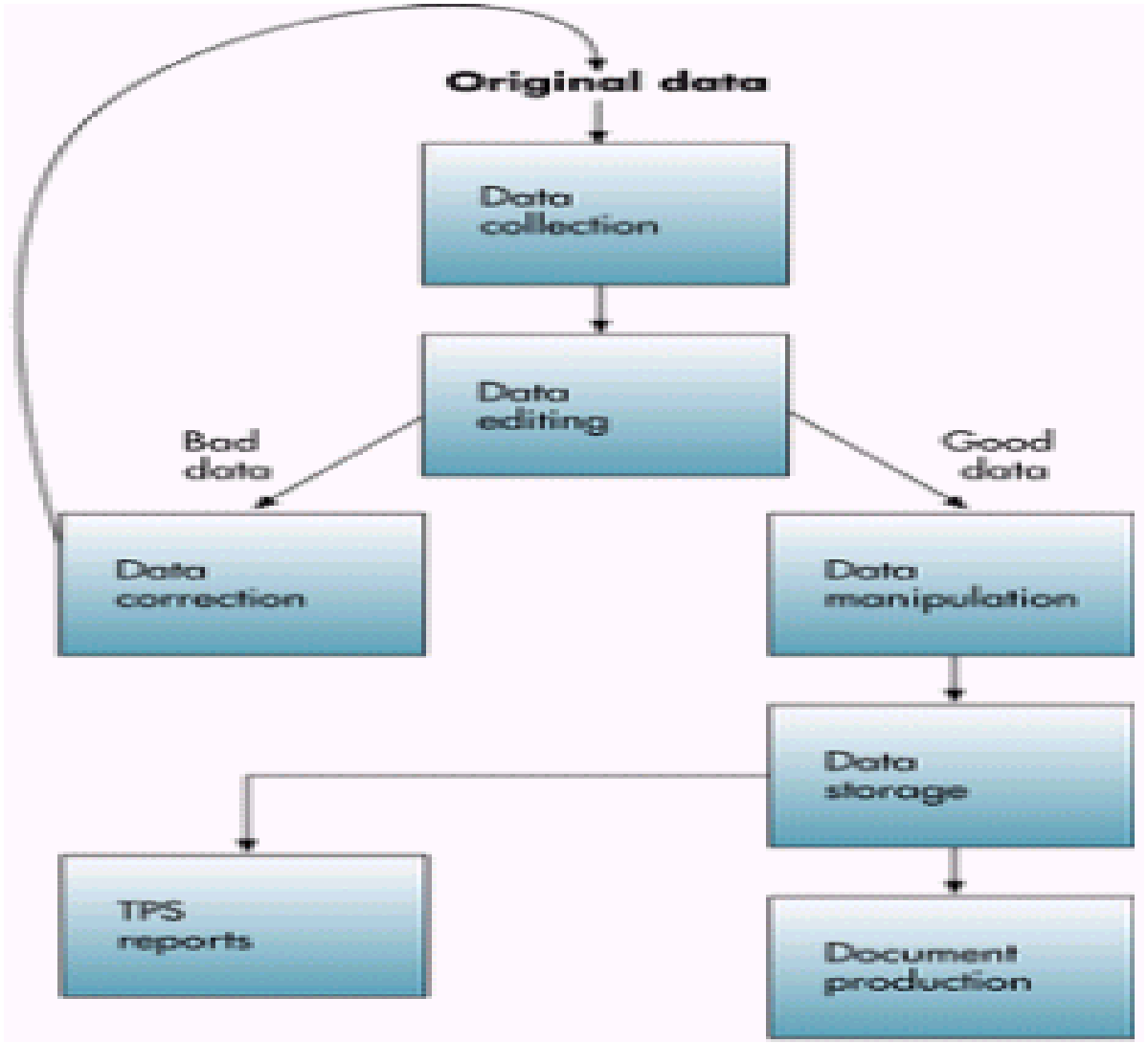
Overview of a TPS



Characteristics of a TPS

- Large amount of input data
- Large amount of output data
- Large storage requirements
- Need for efficient processing
- Fast input/output capabilities
- High degree of repetition in processing
- Simple Computations
- Need for editing
- If fails to operate correctly, the impact on the organization is high

Transaction Processing Activities

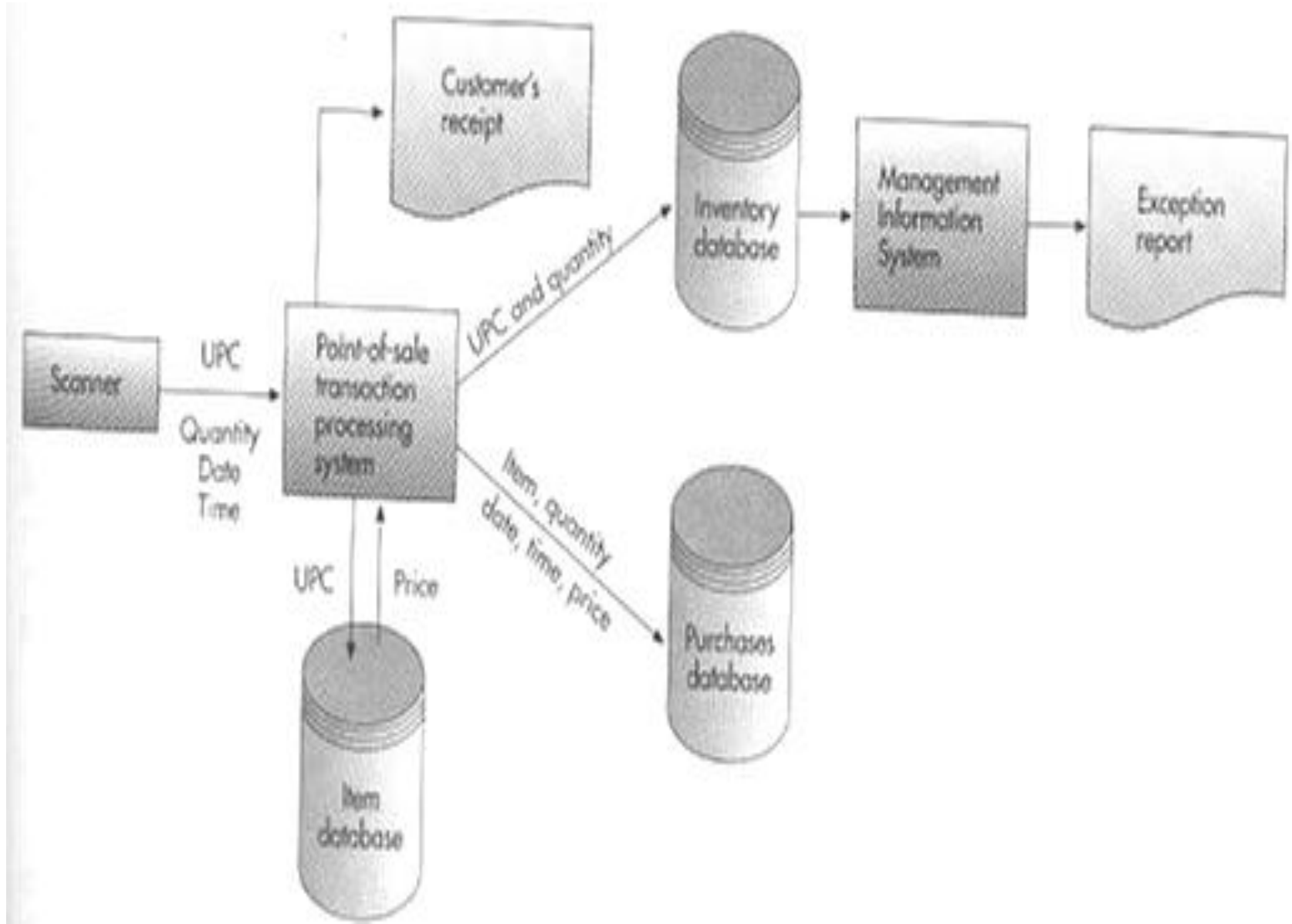


Transaction Processing Activities

- Data Collection
  - process of capturing and gathering all data needed to complete one or more transactions.
  - Can be done manually, or using devices .. E.g.??
- Data Editing
  - process of checking data for validity and completeness.
- Data Correction
  - process of reentering misread or misscanned data that was found during the data editing.

Transaction Processing Activities

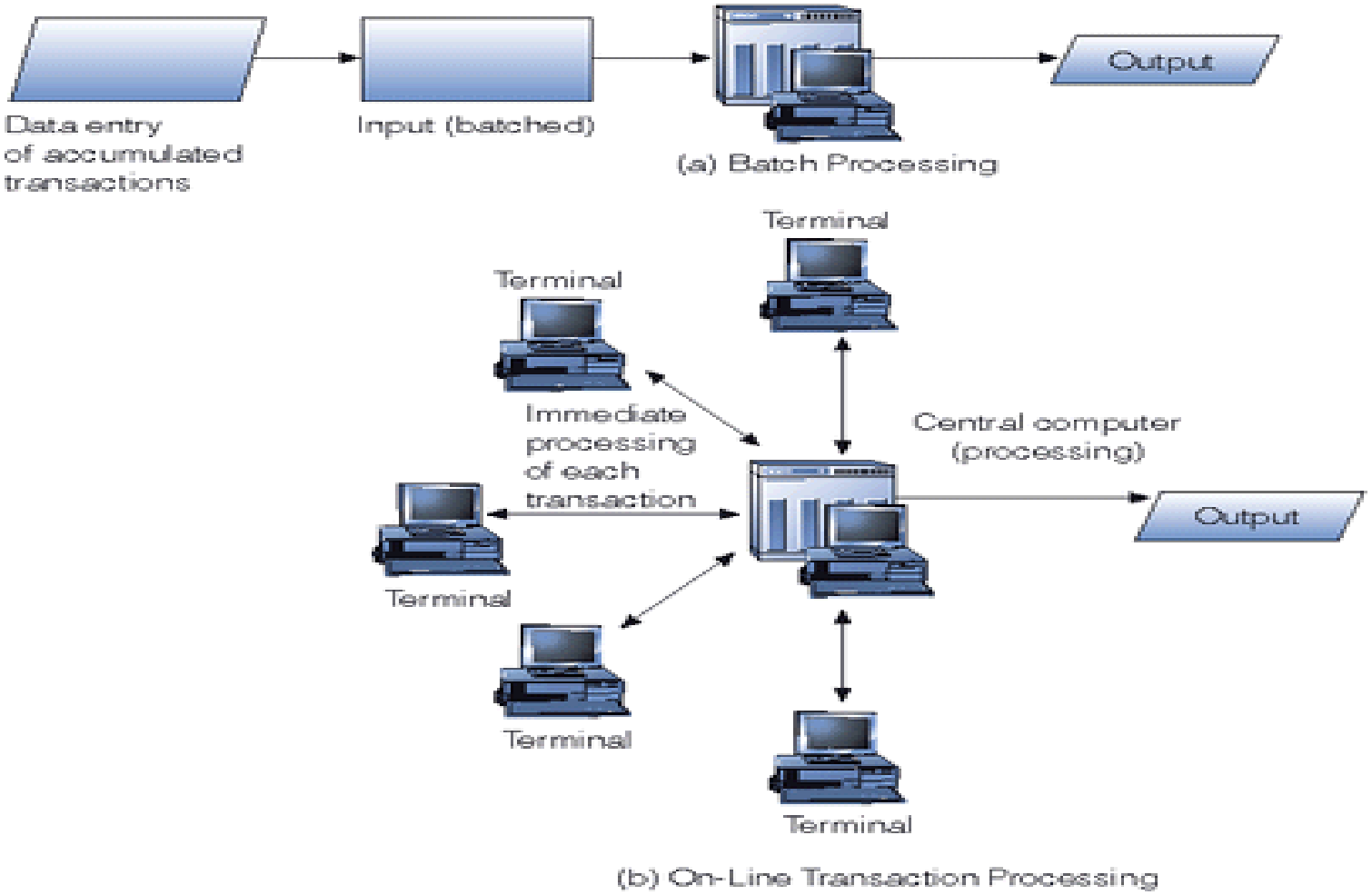
- Data Manipulation
  - process of performing calculations and other data transformations like classifying data and sorting files.
- Data Storage
  - process of placing transaction data into one or more databases.
- Document Production
  - process of creating reports and outputting records. Output can be printed on paper (hard copy) or displayed on the screen (soft copy).


Customer's receipt
Inventory database
Management Information System
Exception report
Scanner
UPC
Quantity
Date
Time
Point-of-sale transaction processing system
UPC and quantity
Item, quantity date, time, price
UPC
Price
Purchases database
Item database

Methods of Transaction Processing

- **Batch Processing**
  - method that collects transactions in groups, called batches, and process them together
- **On-line Transaction Processing**
  - method that completes business transactions as they occur (i.e., airline reservation or bank withdrawal).

Batch versus On-Line Transaction Processing



Batch TPS

- Originally, the only available option
- Transactions accumulated over period of time
- Time period – day, week, month
- Transaction records accumulated in files
- When batches are processed, what happens?
  - Update databases
  - Generate reports

Batch Processing Pros and Cons

- Pros
  - Relatively easy to program, install and maintain
  - Batches can be processed during low-activity periods
- Cons
  - Information is delayed

Online TPS (OLTP)

- Transactions are processed in real time
- Required for any “modern” application where time is critical

Hybrid TPS

- Online entry with delayed processing
- Compromise between batch and OLTP
- OLTP applications can feed transactions to batch systems
  - E.g. Real time order capture with delayed processing

TPS Requirements

- Capture, process and store transactions
- Produce reports and information about transactions
- Produce transactions for other TPS
- Be accurate and timely
- Be efficient – require less labor
- Increase customer service
- Increase competitive advantage

TPS Activity Model

- Data capture
  - From online entry or “external” system
- Data validation
  - Should be done as close to source as possible
- Processing
  - Data manipulation
  - Database updating
  - Generation of transactions for other systems
- Archive Transaction
- Create documents and reports

Management Issues

- Uptime
  - How long can the system be “down” before significant costs are incurred?
- Processing Delays / Response Times
  - How quickly must a transaction be processed?
  - What is the worst online response time that is acceptable
- Disaster Recovery
  - What plans are in place to recover lost business data?
  - What plans are in place to resume business processing in case of disaster?
- Audit
  - Can you verify the integrity of the system?
  - How will you know if transactions are not processed or are processed incorrectly?

TPS Examples

- Exercise: Find some EXAMPLEs

TPS Examples

Order Processing	Purchasing	Accounting
• Order entry • Sales configuration • Shipment planning • Inventory control (finished product) • Invoicing and billing • Customer interaction • Routing and scheduling	• Inventory control (raw materials, packing materials, spare parts, and supplies) • Purchase order processing • Receiving • Accounts payable	• Budget • Accounts receivable • Payroll • Asset management • General ledger

TABLE 9.2

The Systems That Support Order Processing, Purchasing, and Accounting Functions

In class Assignment 1

1. Transaction Processing systems perform routine operations.(True / False)
2. A TPS uses less sophisticated processing than other types of organizational computing(I.e.DSS, MIS) (True / False)
3. Batch processing involves ……..
4. OLTP stands for……
5. Describe the basic activities common to all transaction processing systems.
6. List several characteristics of transaction processing system.

In class Assignment 1 cont.…

7. Which of the following sets of characteristics are usually associated with transaction processing systems?
    a) sophisticated and complex processing and analysis
    b) process large amount of data and produce large amount of output
    c) batch processing only
    d) produce exception reports and support drill-down analysis

8. Which of the following is NOT one of the basic components of a TPS?
    a) databases
    b) networks
    c) procedures
    d) analytical models