Module 2
Introduction to Databases and DBMSs

Lesson 5: Transaction Processing Overview

Lesson Objectives

- Provide an example of a transaction that you use
- Briefly explain key characteristics of database transactions
- Explain the word "transparency" for transaction processing services

Transaction Definition

- Supports daily operations of an organization
- Collection of database operations
- Reliably and efficiently processed as one unit of work
- No lost data
  - Interference among multiple users
  - Failures

Airline Transaction Example

```
START TRANSACTION
     Display greeting
     Get reservation preferences from user
     SELECT departure and return flight records
     If reservation is acceptable then
          UPDATE seats remaining of departure flight record
          UPDATE seats remaining of return flight record
          INSERT reservation record
          Email receipt if requested
     End If
     On Error: ROLLBACK
COMMIT
```

ATM Transaction Example

```
START TRANSACTION
      Display greeting
      Get account number, pin, type, and amount
      SELECT account number, type, and balance
      If balance is sufficient then
            UPDATE account by posting debit
            UPDATE account by posting credit
            INSERT history record
            Display message and dispense cash
            Print receipt if requested
      End If
      On Error: ROLLBACK
COMMIT
```

Transaction Processing

- Reliable and efficient processing of transactions
  - Control concurrent users
  - Recover from failures

- Internal features for enterprise DBMSs
  - Concurrency control manager
  - Recovery manager
  - Transparent services for application developers

Summary

- Supports daily operations
- Evolution over 50 years
- Key technology behind growth of electronic commerce and mobile computing