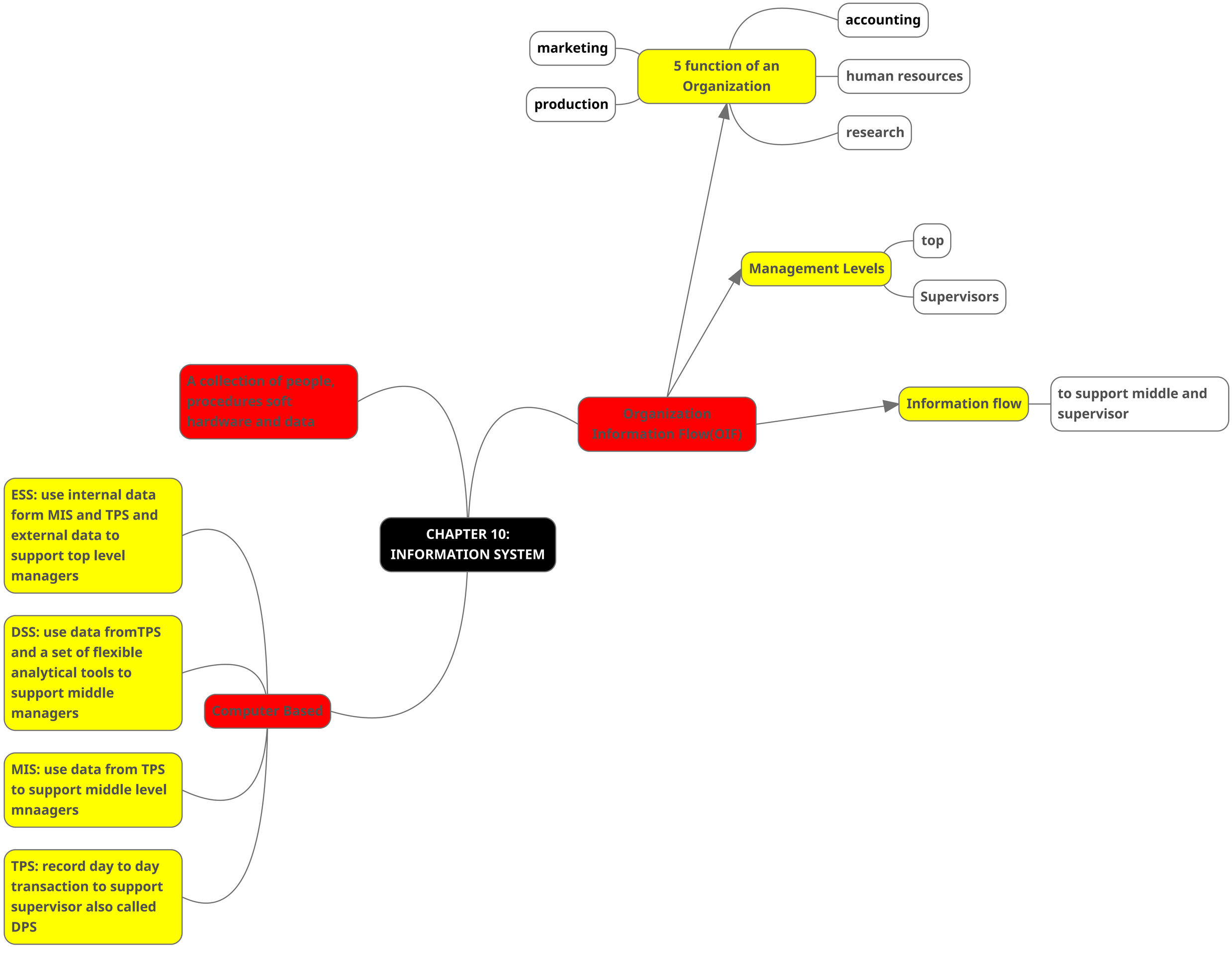
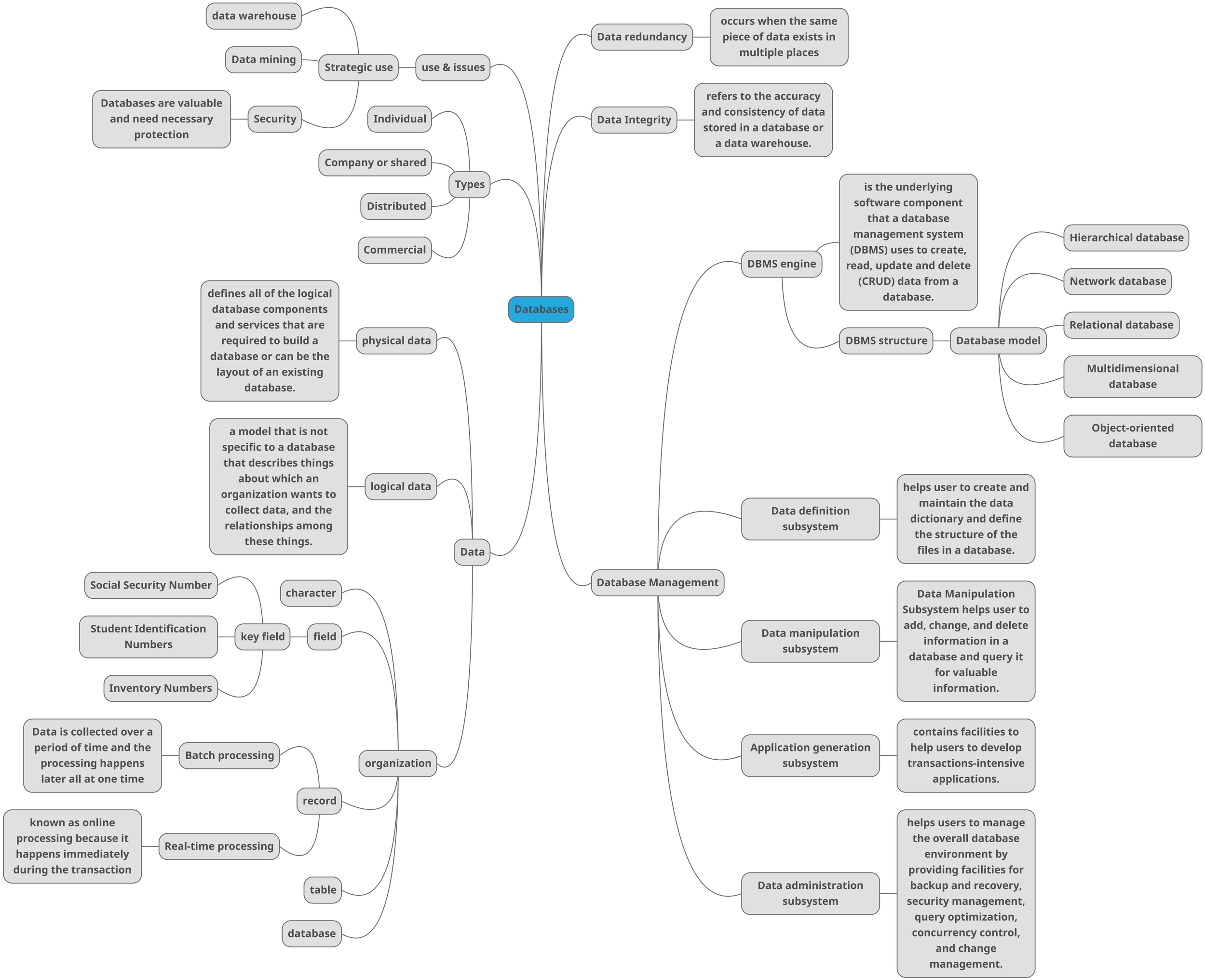

CHAPTER 10: INFORMATION SYSTEM
Organization Information Flow(OIF)
5 function of an Organization
accounting
human resources
research
marketing
production
Management Levels
top
Supervisors
Information flow
to support middle and supervisor
Computer Based
A collection of people, procedures soft hardware and data
ESS: use internal data form MIS and TPS and external data to support top level managers
DSS: use data fromTPS and a set of flexible analytical tools to support middle managers
MIS: use data from TPS to support middle level mnaagers
TPS: record day to day transaction to support supervisor also called DPS


Databases
Data
use & issues
Strategic use
data warehouse
Data mining
Security
Databases are valuable and need necessary protection
Types
Individual
Company or shared
Distributed
Commercial
physical data
defines all of the logical database components and services that are required to build a database or can be the layout of an existing database.
logical data
a model that is not specific to a database that describes things about which an organization wants to collect data, and the relationships among these things.
organization
character
field
key field
Social Security Number
Student Identification Numbers
Inventory Numbers
record
Batch processing
Data is collected over a period of time and the processing happens later all at one time
Real-time processing
known as online processing because it happens immediately during the transaction
table
database
Data redundancy
occurs when the same piece of data exists in multiple places
Data Integrity
refers to the accuracy and consistency of data stored in a database or a data warehouse.
Database Management
DBMS engine
is the underlying software component that a database management system (DBMS) uses to create, read, update and delete (CRUD) data from a database.
DBMS structure
Database model
Hierarchical database
Network database
Relational database
Multidimensional database
Object-oriented database
Data definition subsystem
helps user to create and maintain the data dictionary and define the structure of the files in a database.
Data manipulation subsystem
Data Manipulation Subsystem helps user to add, change, and delete information in a database and query it for valuable information.
Application generation subsystem
contains facilities to help users to develop transactions-intensive applications.
Data administration subsystem
helps users to manage the overall database environment by providing facilities for backup and recovery, security management, query optimization, concurrency control, and change management.

Sytem Analysis and Design

PHASE 1 : Preliminary Investigation

Determines the need fot a new infromation system

1. Identify Problem
2.Find Alternative
3. Produce Report

PHASE 2 : System Analysis

Data is collected about the present system and then analyzed to determine the new requirements

1. Gather Data
2. Analyze Data
- Uses Top-Down analysis method
- Grid charts, Decision tables , System flowcharts , Data flow diagrams

3.Produce a Report

PHASE 3 : System Design

Evaluate systems according to economic , technical and operational feasibility

1. Look for Alternatives
2. Choose the Best option
3.Produce a Report

PHASE 4 : Systems Development

Acquire the software and hardware, and test the new system

1. Software Developmment
2. Hardware Development
3.Testing

PHASE 5 : Systems Implementation

a.k.a Coversion that allows us to converts the old system to the new one .

Trains people to use the new system

Conversion approaches
-direct
-parallel
-pilot
-phased .

PHASE 6 : Systems Maintenance

A very important ongoing activity that includes a system audit and a periodic evaluation

System audit

Periodic evaluation

PROGRAMMING LANGUAGE

PROGRAMMING = A list of instructions for the computer to follow to process data

Software development

6 step procedure

Step 1: Program specification
-program definition or program analysis which gathers all the specific details required for a new system as well as determines the first ideas for prototypes
- Five steps to complete in the process:
1. Objectives
2. Outputs
3. Inputs
4. Processing
5. Documents

Step 2: Design
- The design stage is a necessary precursor to the main developer stage.Developers will first outline the details for the overall application, alongside specific aspects
-Plan a solution using structured programming techniques:
- Top-down design = Identify the program modules required
- Pseudocode = Provide an outline of the logic and summarize the program you will write
- Flowcharts = Graphically depict the sequence of steps required to solve a programming problem
- Logic structures = Concatenation structure / Selection structure / Repetition structure

Step 3: Program Code
-Writing the program or coding
-Characteristics of a good program:
- Works reliably
- Produces the correct output
- Catches common input errors
- Code is well-documented and understandable
- Uses an appropriate computer language
- Content-markup languages (HTML, XML, XHTML, SVG)
- Programming languages (C, C++, C#, Java, JavaScript, Visual Basic)

Step 4: Program Test
- Debugging to test code and eliminate errors such as:
- Syntax errors = error in the source code of a program
- Logic errors = errors in the flow or logic of a program

Step 5: Program Documentation
- Written descriptions about a program
- Important for people who will use and/or support the program which is users, operators and programmers
- Before proceeding with the maintenance, user will review, finalize and distribute the program

Step 6: Program Maintenance
- Developers move into a maintenance mode and begin practicing any activities required to handle issues reported by end-users.
- developers are responsible for implementing any changes that the software might need after deployment.
- To ensure the program is:
- Error-free
- Effective
- Efficient
-Involving two activities categories:
- Operations
- Changing needs

CASE TOOLS (Computer-aided software engineering)
- a software package that provides support for the design and implementation of information systems. It can document a database design and provide invaluable help in maintaining the consistency of a design.
- Automates portions of the development process:
- Program design
- Coding
- Testing

Object-oriented programming (OOP) Software Development
- OOP is a programming paradigm based on the concept of "objects", which can contain data and code: data in the form of fields, and code, in the form of procedures.
- Focuses less on procedures, more on relationships between objects
- Objects contain both the data and the processing operations needed to perform a task

PROGRAM = detailed plan or procedure for solving a problem with a computer

A problem-solving procedure

A list of instructions
- Prewritten
- Custom-written
- Application software
- System software

Generations of Programming Languaes

Occurring in “generations” or “levels“
- Coding from machine languages to human or natural languages

five distinct generations
- Lower level is closer to machine language
- Higher level is closer to human-like language

- 1st Gen: Machine languages
- 2nd Gen: Assembly languages
- 3rd Gen: High level procedural languages (3GLs)
- 4th Gen: Task-oriented languages (4GLs)
- 5th Gen: Problem and Constraint languages (5GL)