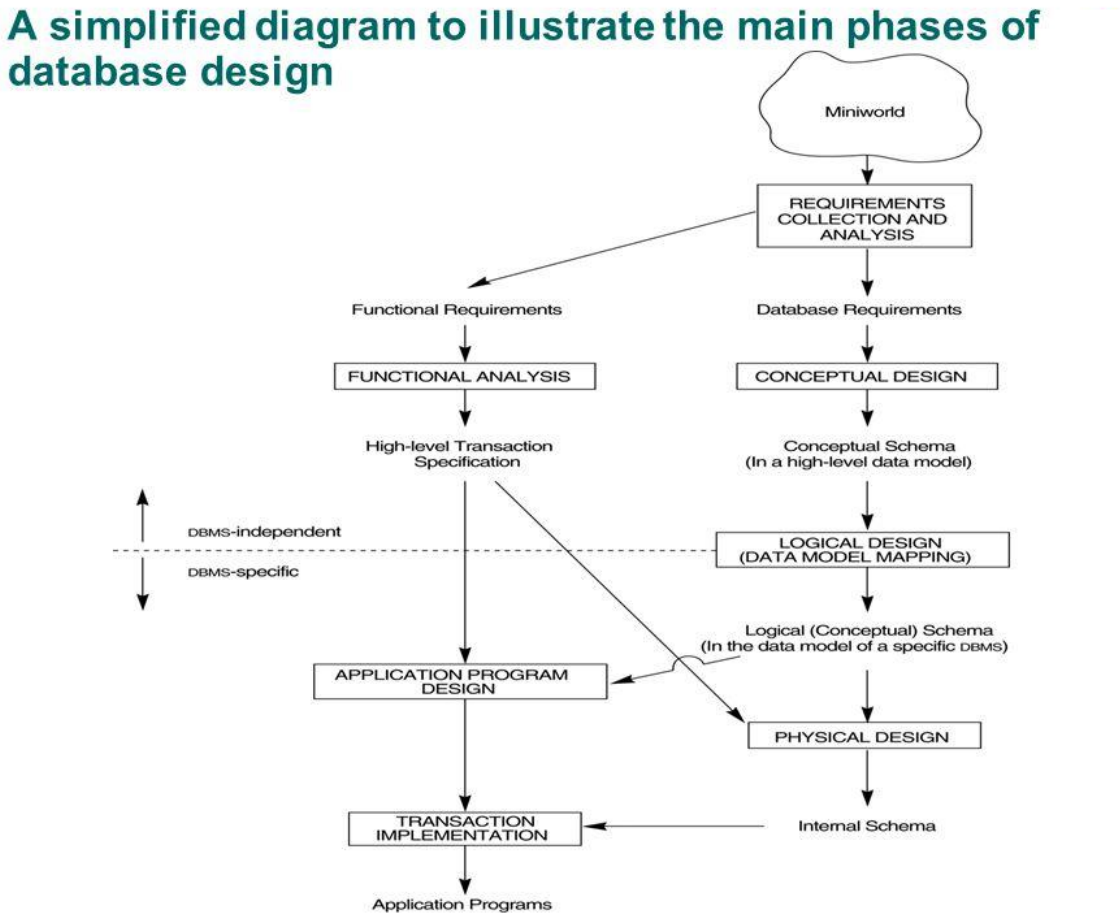
Database Management System
Lecture: 5
Main Phases of Database Design

Fig below shows a simplified description of the database design process. The various phases are:



1. **Requirements Collection and analysis:**
   - During this step, the database designers interview prospective database users to understand and document their data requirements.
   - The result of this step is a concisely written set of users' requirements.
   - In parallel with specifying the data requirements, it is used to specify the known functional requirements of the application.
     - These consists of the user defined operations (or transactions) that will be applied to the database, including both retrievals and updates.

2. **Conceptual Design:**
    - Once all the requirements have been collected and analyzed, the next step is to create a conceptual schema for the database, using a high level conceptual data model.
    - The conceptual schema is a concise description o the data requirements o the users and includes detailed descriptions of the entity types, relationships and constraints.
    - These concepts do not include implementation details → they are usually easier to understand and can be used to communicate with nontechnical users.
    - The high level conceptual schema can also be used as a reference to ensure that all users data requirements are met and that the requirements do no conflict.
3. **Logical Design or Data Model Mapping:**
    - The next step in database design is the actual implementation of the database using a commercial DBMS.
    - The conceptual schema is transformed from the high level data model into the implementation data model such as the relational or the object relational database model.
4. **Physical Design:**
    - In this phase, the internal storage structures, indexes, access paths and file organization for database files are specified.
    - In parallel with these activities, application programs are designed and implemented as database transactions corresponding to the high level transaction specifications.