CHAITANYA
WOMEN'S COLLEGE
DEGREE & PG
AFFILIATED TO ANDHRA UNIVERSITY

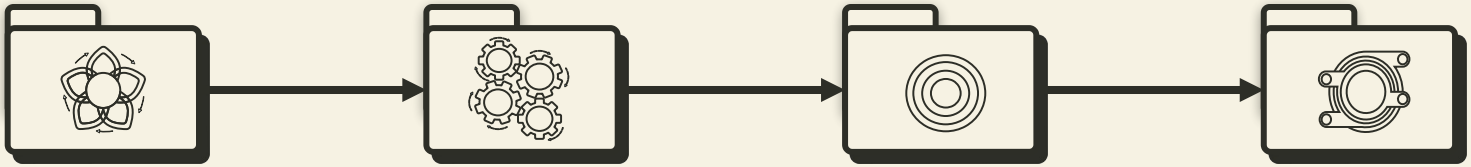
DATABASE DESIGN

UNIT
3

01

DESIGN PROCESS

Database life cycle



Phase 1

Requirement analysis

Phase 2

Logical design

Phase 3

Physical design

Phase 4

Database implementation, monitoring, and modification.

1. DATABASE INTIAL STUDY

- Requirement collection & analysis
- Dbms Software Selection

  Factors affecting purchasing decisions
  - Cost
  - DBMS feature and tools
  - Underlying model
  - Portability
  - Hardware requirements

2. LOGICAL DESIGN

- Most critical phase of DBLC
- Makes sure the final product meets requirements
- A. Conceptual data modeling
- B. View integration
- C. Transformation of the conceptual data model to SQL tables.
- D. Normalisation of tables

a. CONCEPTUAL DESIGN

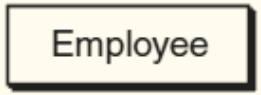
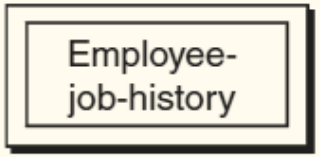
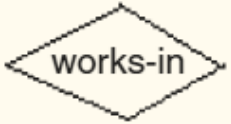
- Data modelling creates abstract data structure to reprent real world items.
- High level abstraction
- Steps:
    - data analysis & requirements
    - er modelling and normalisation
    - data model verification
    - distributed database design

ER MODEL

1. The major activity of this phase is identifying entities, attributes, and their relationships to construct model using the Entity Relationship Diagram.
   a. Entity _ table

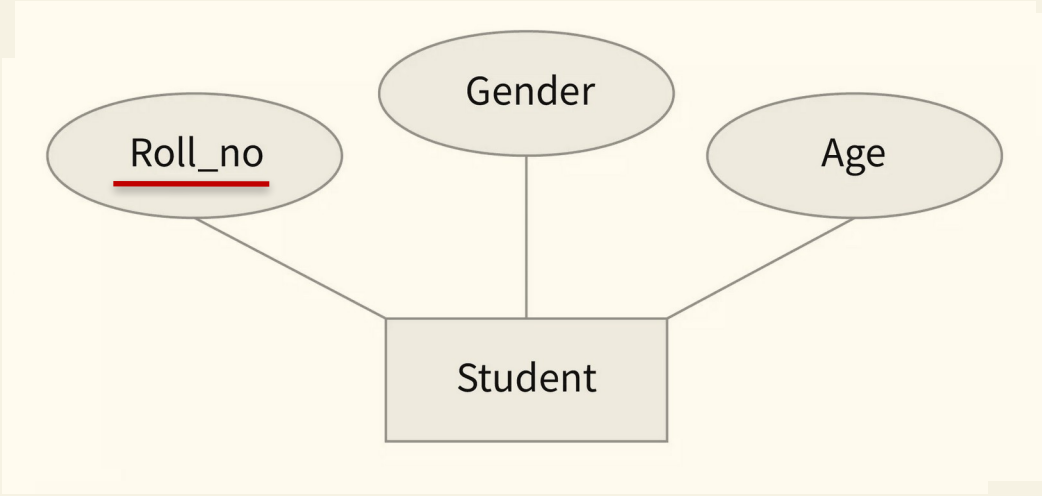
   b. Attribute _ column

   c. Relationship _ line

Concept	Representation & Example
Entity	
Weak entity	
Relationship	

CLASSES OF ATTRIBUTES

1. Simple attribute
2. Composite attribute
3. Derived attributes
4. Single-valued attribute
5. Multi-valued attribute
6. Key attribute



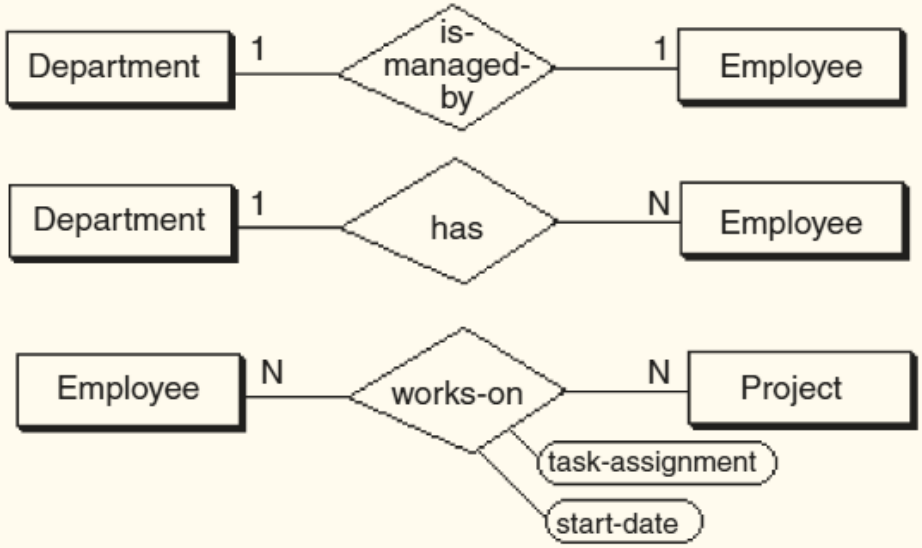
Note: Click on the names of the attributes

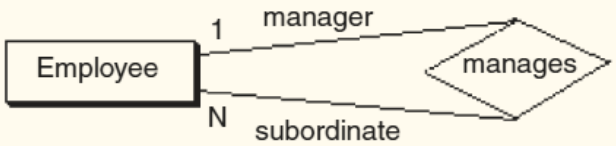
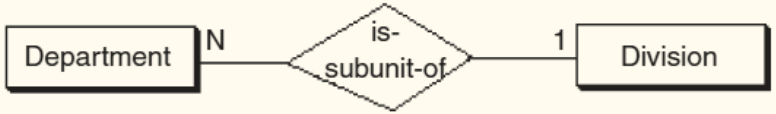
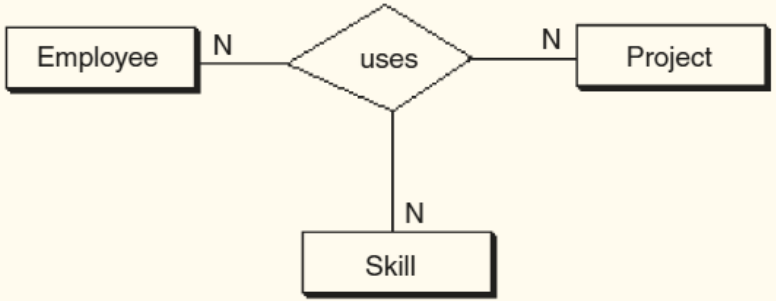
Connectivity

one-to-one

one-to-many

many-to-many



Concept	Representation & Example
Degree recursive binary	
binary	
ternary	

CARDINALITY

Symbol	Meaning
	Mandatory—One
	Mandatory—Many
	Optional—One
	Optional—Many

Example:

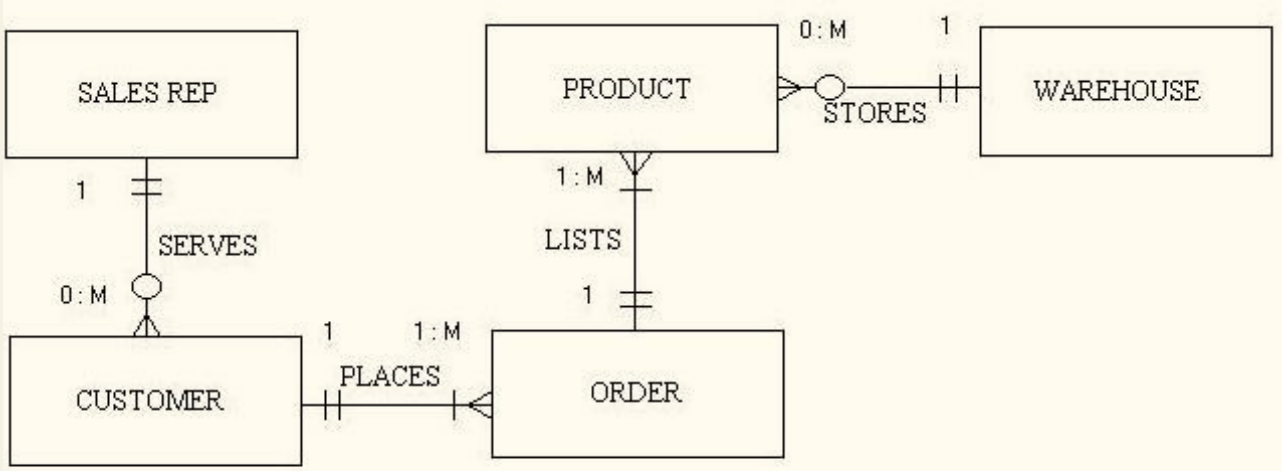


Figure 1. Entity-Relationship Diagram

* 1 INSTANCE OF A SALES REP SERVES 1 TO MANY CUSTOMERS
* 1 INSTANCE OF A CUSTOMER PLACES 1 TO MANY ORDERS
* 1 INSTANCE OF AN ORDER LISTS 1 TO MANY PRODUCTS
* 1 INSTANCE OF A WAREHOUSE STORES 0 TO MANY PRODUCTS

b. VIEW INTEGRATION

- To eliminate redundancy and inconsistency
- Views must be “rationalized” and consolidated into a single global view.
- Uses ER semantic tools such as identification of synonyms, aggregation, and generalization

c. CONCEPTUAL DATA MODEL TO SQL TABLES

- Data modeling constructs
- Redundant tables are eliminated

d. NORMALIZATION

- Organisation of data
- Reduces data redundancy

3. PHYSICAL DESIGN

- Selection of data storage and access characteristics
- Becomes complex for distributed systems
- Designer favors the software that hides physical details

4. DATABASE IMPLEMENTATION, MONITORING, AND MODIFICATION.

4. a. IMPLEMENTATION & LOADING

4. b. TESTING & EVALUTION

4. c. OPERATION

4. d. MAINTANCE & EVALUTION

QUERY LANGUAGES

- Primarily created for creating, accessing and modifying data in and out from a dbms.

- Types:
    1. procedural language
    2. non- procedural language

EMBEDDED SQL

- Embedded sql applications connect to databases and execute embedded sql statements.
- Advantanges:
    - lets access to db from anywhere,
    - allows integrating authentication service for large scale apps
    - provides extra security to database transactions
    - avoids logical errors
    - easy to integrate frontend and backend of our applications

DATA INDEPENDENCE

- Ability to modify a scheme such that it doesn’t affect the schema in the next higher level
- Types:
    1. physical data independence

capacity to change the internal schema without having to change the conceptual schema.

    2. logical data independence

ability to change the conceptual schema without having to change external schema.