

MANCHESTER
1824

The University of Manchester

DATA MODELLING OF DATABASE APPLICATIONS

COMP23111 – Database Systems



OUTLINE

Database Application Model

Database Application Design Phases

Conceptual Data Model

Logical Data Model

Physical Data Model

DATABASE APPLICATION MODEL

Username:

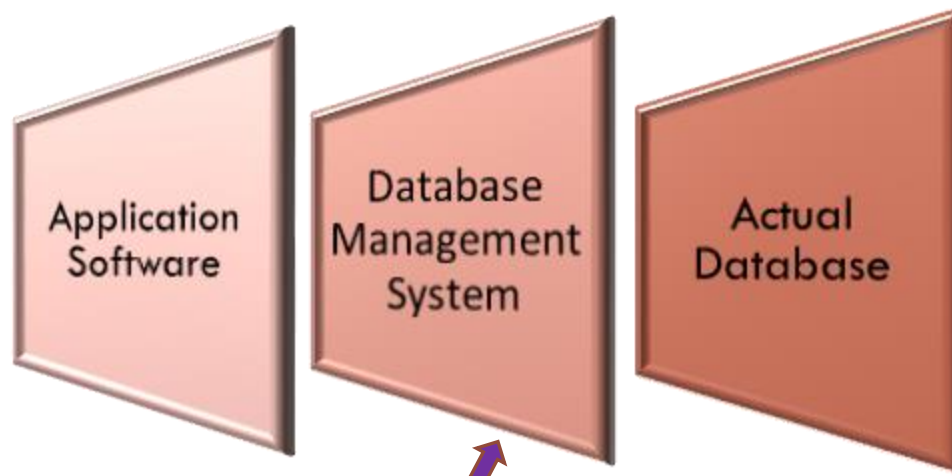
User123_

Username is not available!

DATABASE APPLICATION MODEL



DATABASE APPLICATION MODEL

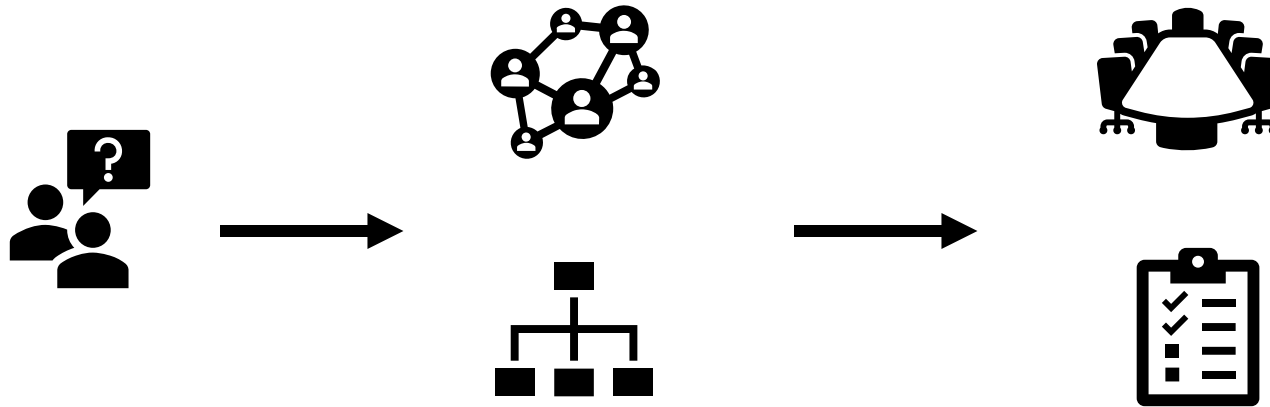


Database seen in **front-end**
[via the application]

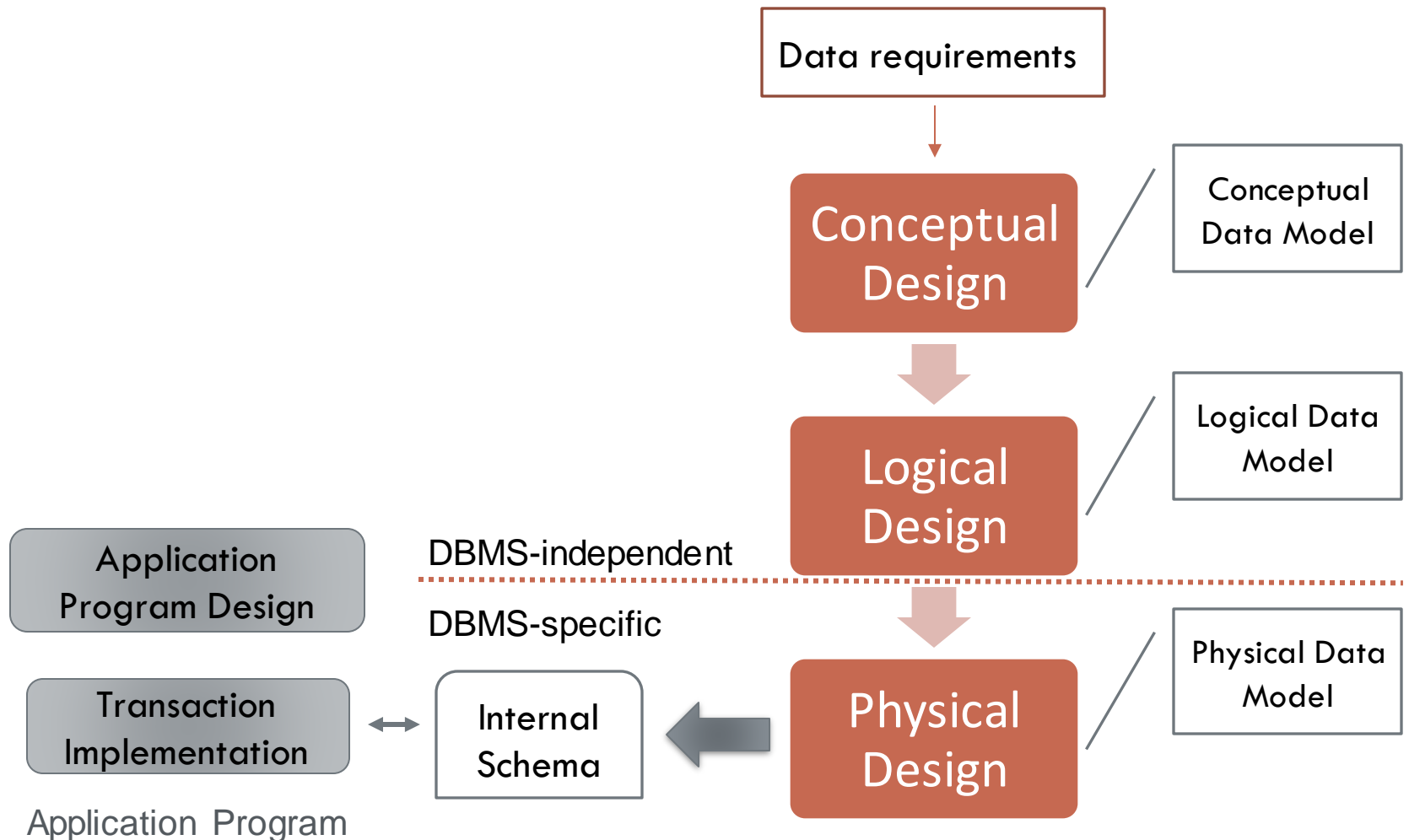
Database seen as a **database model**
[via the DBMS]

Data organised in data
structures *[Integrated database]*

DATABASE APPLICATION DESIGN PHASES

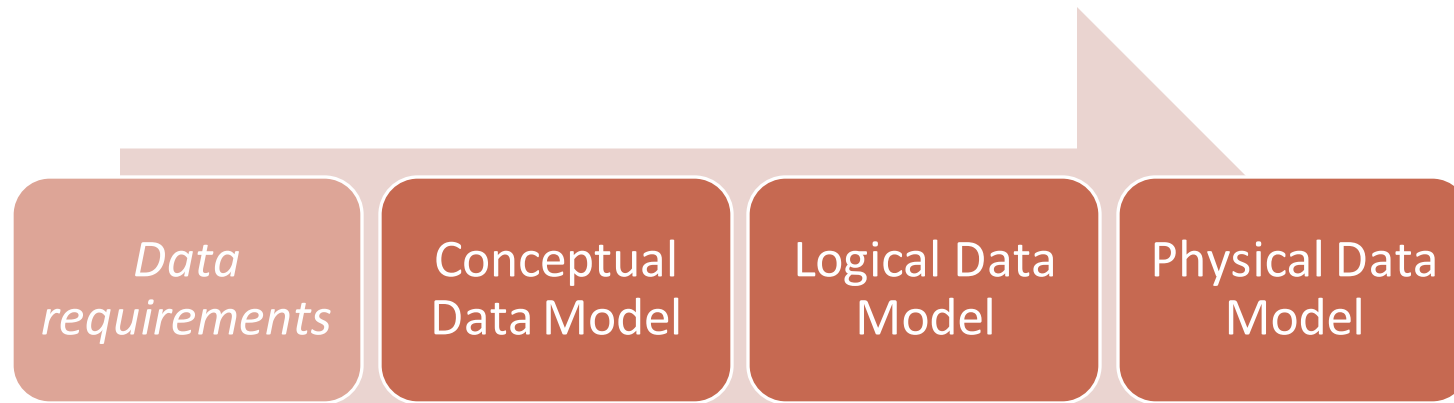


DATABASE APPLICATION DESIGN PHASES



DATABASE APPLICATION DESIGN PHASES

- *DATA MODELLING*



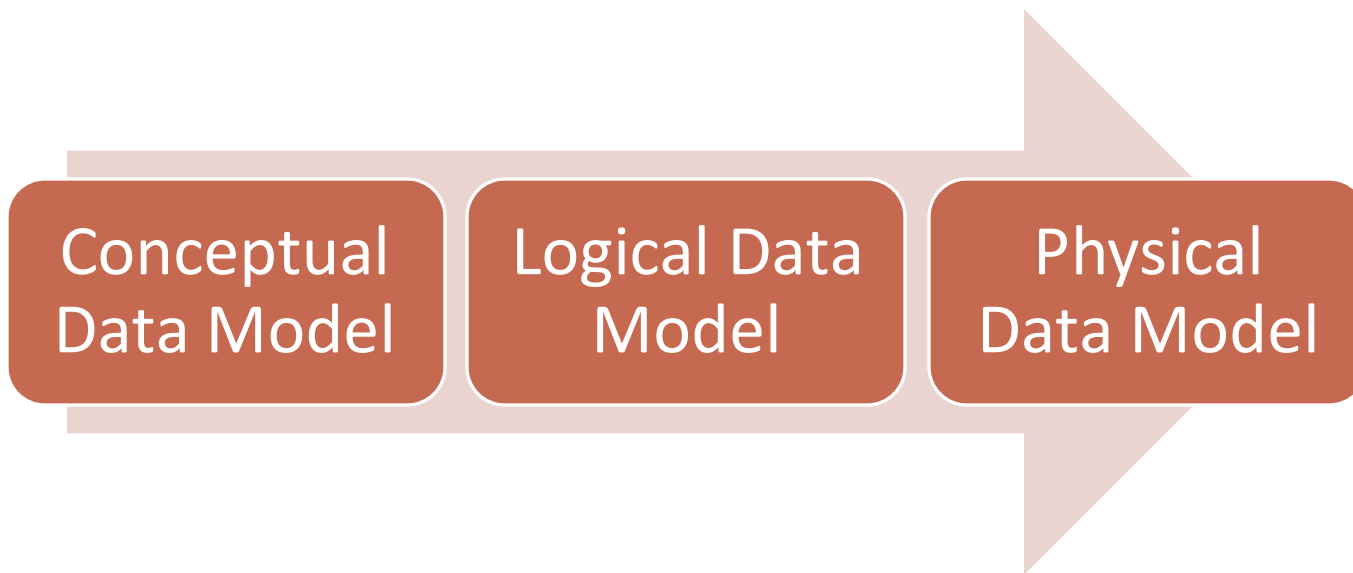
- "A user should be able to place an order."
- "An order should save all the selected products of the user."

- Customer
- Orders
- Products

- Customer (c id, name...)
- Orders (o id, c id...)
- Products (p id, o id...)

- Customer (c_id, name...)
 - Orders (o_id, c_id...)
 - Products (p_id, o_id...)
- + PK/FK, datatypes..

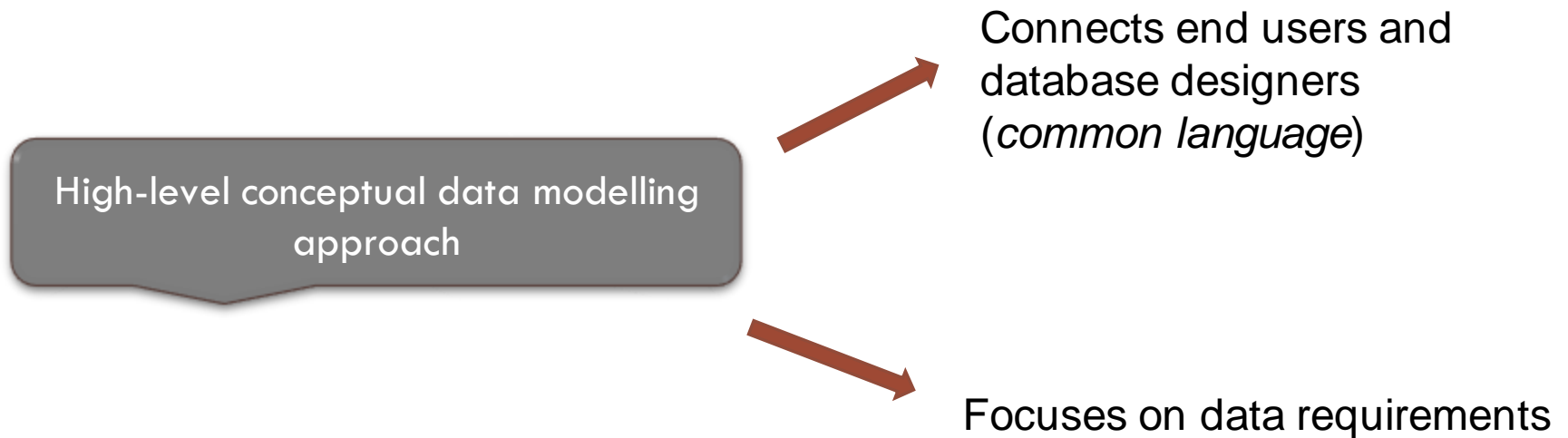
DATABASE APPLICATION DESIGN PHASES - *DATA MODELLING*



- Entity-Relationship Diagram (ERD)

DATABASE APPLICATION DESIGN PHASES - *ERD*

- ER Modelling



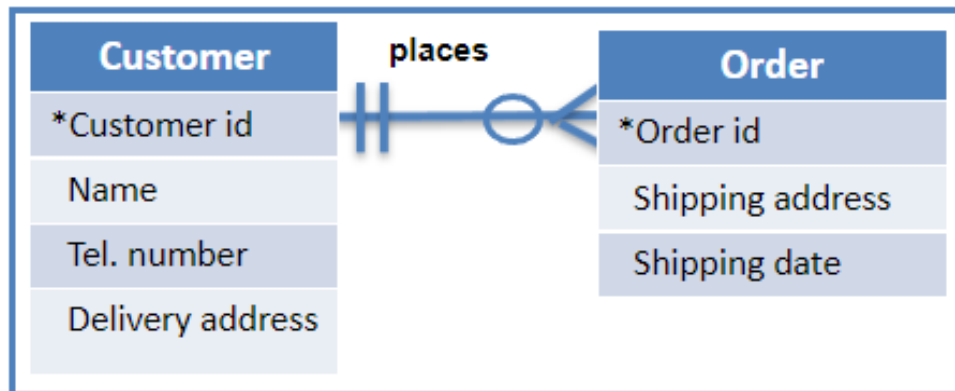
DATABASE APPLICATION DESIGN PHASES - *ERD*

- Why ER modelling?
 - Simple ✓
 - Flexible ✓
 - Famous ✓

CONCEPTUAL DATA MODEL

Also known as conceptual schema.

- Precise, **high-level** description of data requirements (via the **ERD**).
- Aids systematic mapping into an elaborate, logical model.

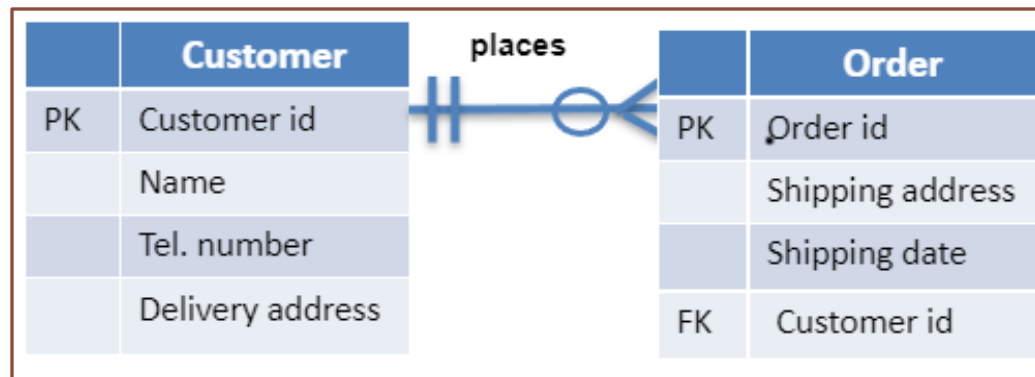


LOGICAL DATA MODEL

Also known as logical schema.

Relational model in our case.

- Represents data structures that will eventually implement the database (agnostic to the DBMS intended for use).
- These data structures include the **specifics about entities and relationships among data**, emerging from the conceptual model.



PHYSICAL DATA MODEL

Also known as physical schema.

- Represents the data structures as they will be implemented in a specific DBMS, with all the technical details needed.
- These data structures will essentially be the **implemented database schema** (relational database in our case).

