

Database management systems and applications



Data in general

- We work with data all the time! You can find many examples around:
 - Checking news in social networks
 - Taxi in mobile application
 - Photos in instagram
 - Balance on bank account
 - List of groceries
 - Cart in online store



Terms

- **Database** – organized collection of data
- **Database management system (DBMS)** – software system
- **Data model** – logical inter-relationships between different data elements of some subject area



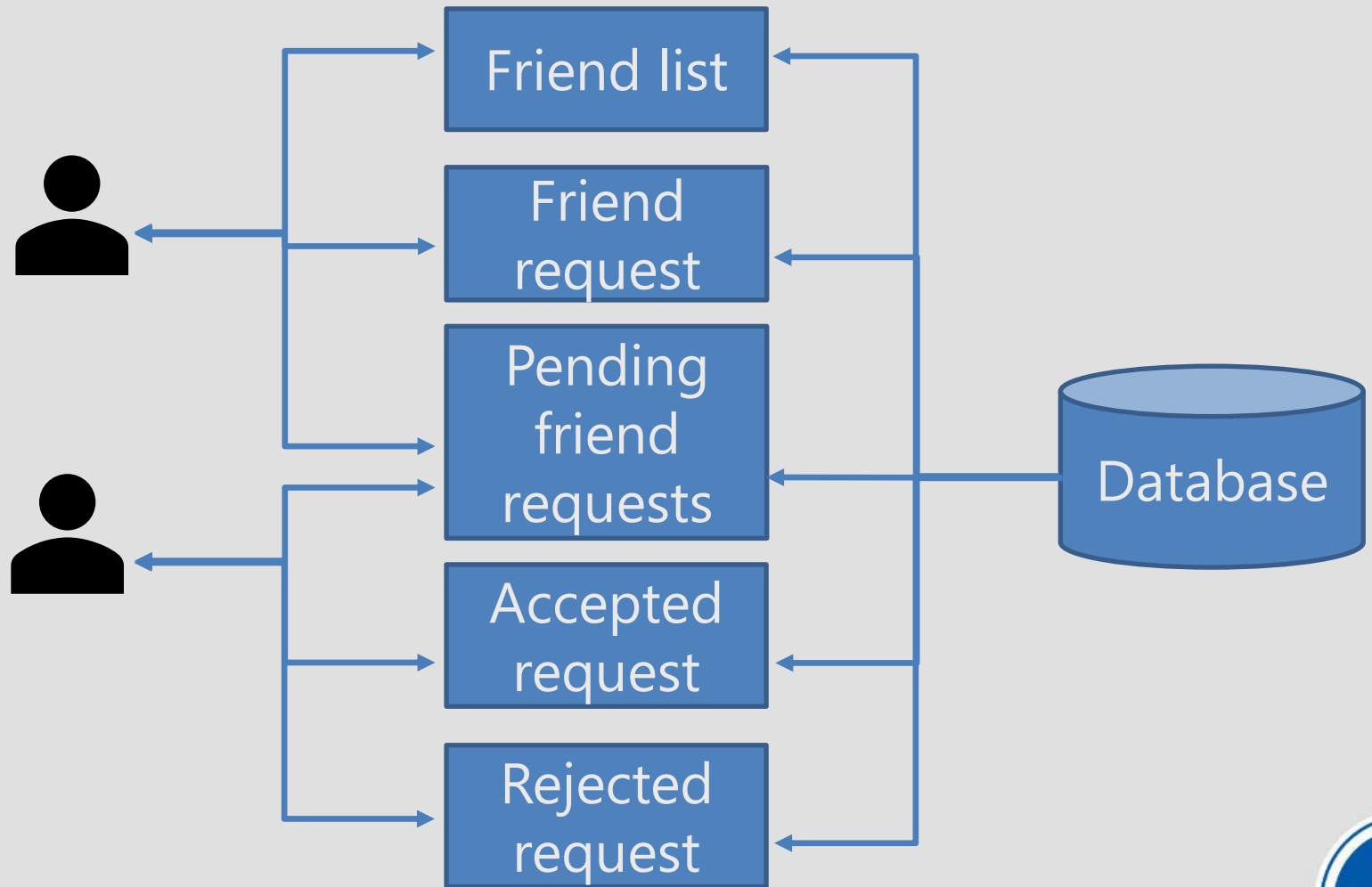
Different types of data

Depending on vendor there can be different data types in DBMS, but the most common are:

- Strings
- Numbers
- Date and time
- Logical data
- Spatial data (geography, geometry)
- Multimedia



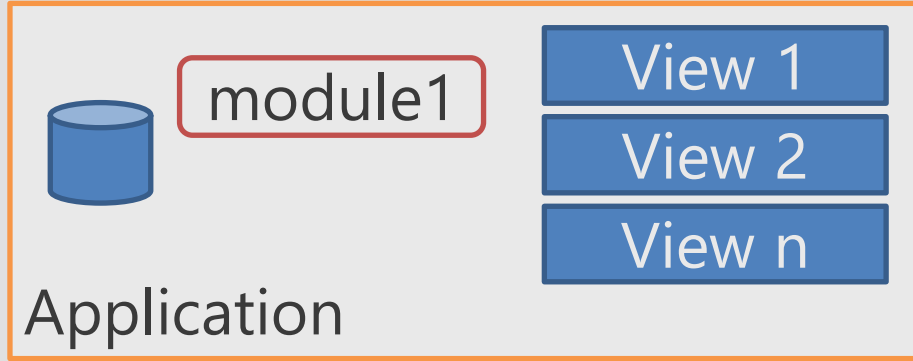
How applications use data



Approaches to building applications

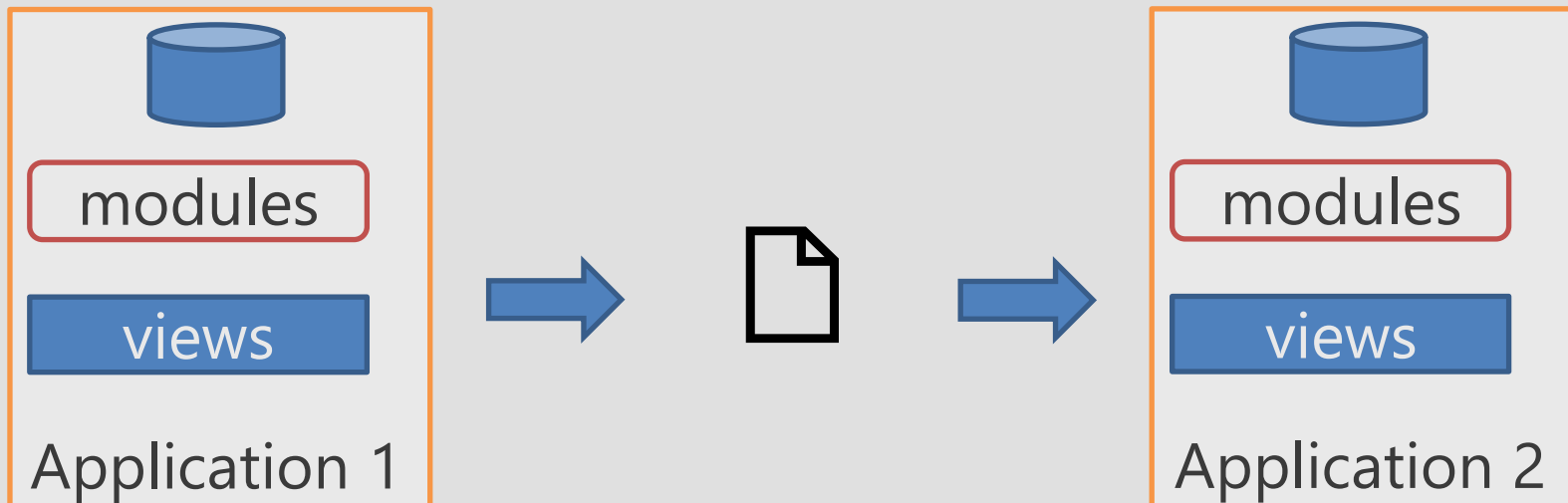


All-in-one application

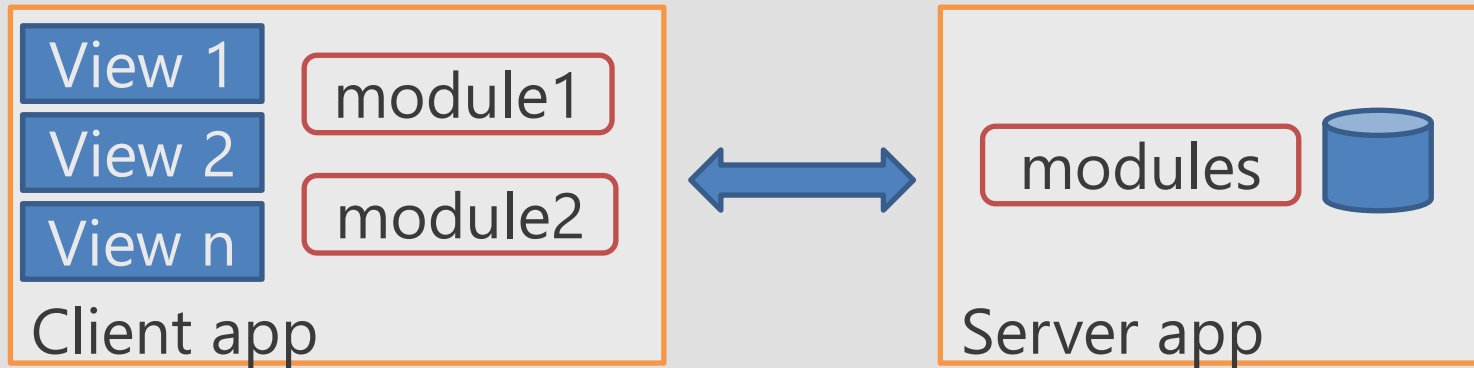


All instruments and data are incorporated in a single installation

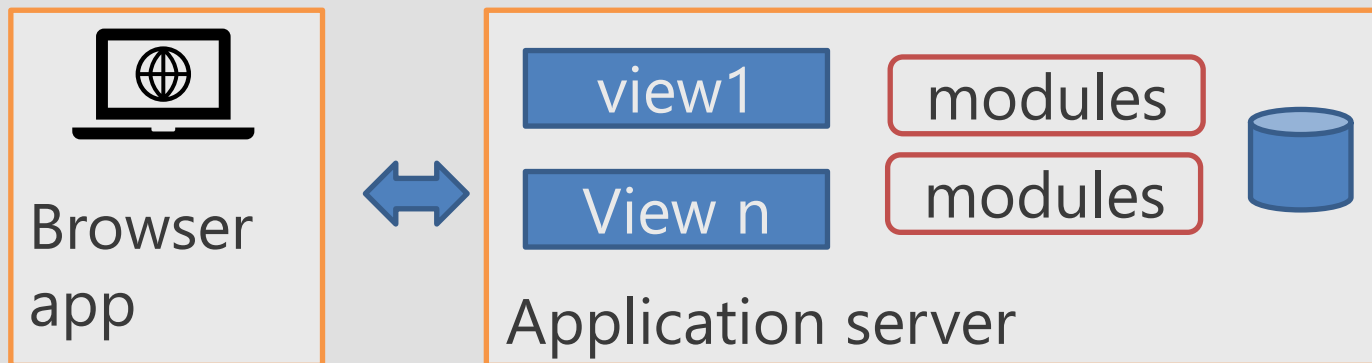
Data exchange with other applications can be done with help of external or internal tools



Client-server application - Fat client

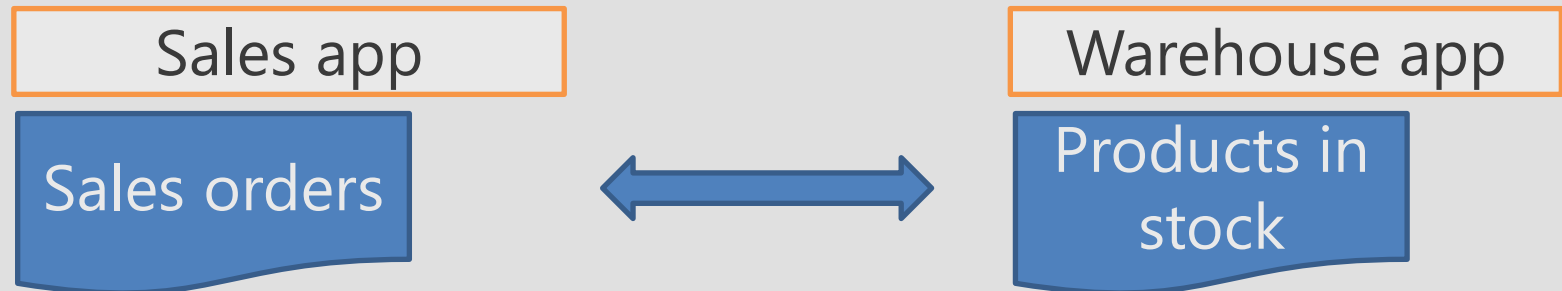


Client-server application - Thin client

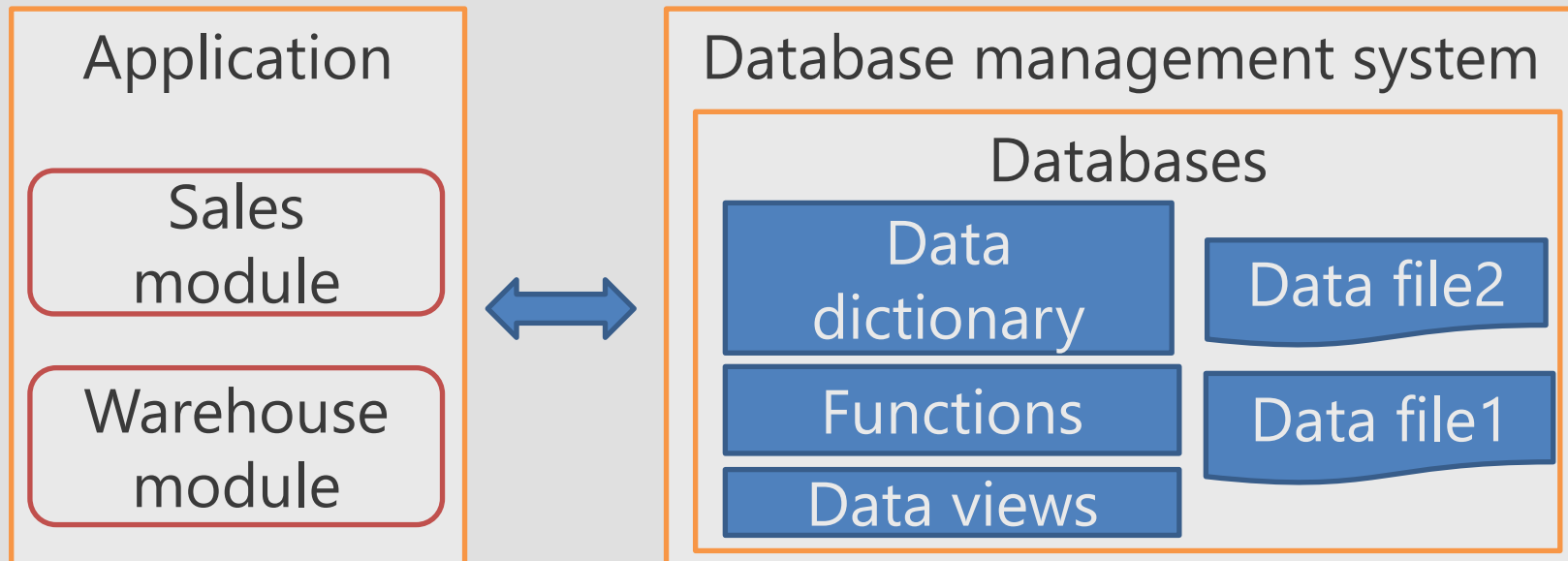


Database vs file-based approach

File-based data management:



Data management with databases:



Database architecture

Data view level

Order forms
data

Product stock
report

Logical level

Order

Product

Stock history

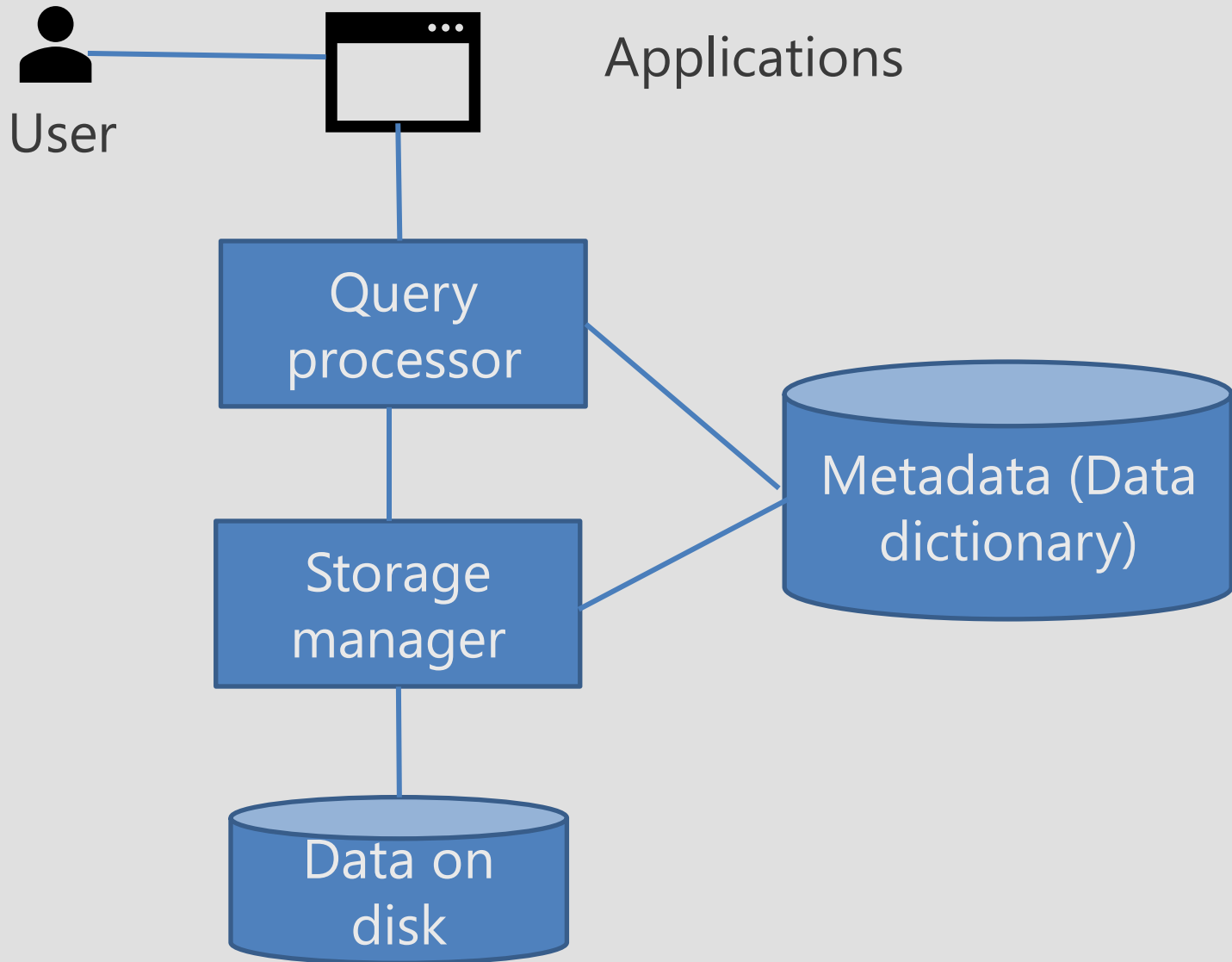
Physical level

Indexes

Data
files



Working with DBMS in a nutshell



Database types

- Main types are:
 - Hierarchical
 - Network
 - **Relational**
 - Object oriented

