Relational Databases
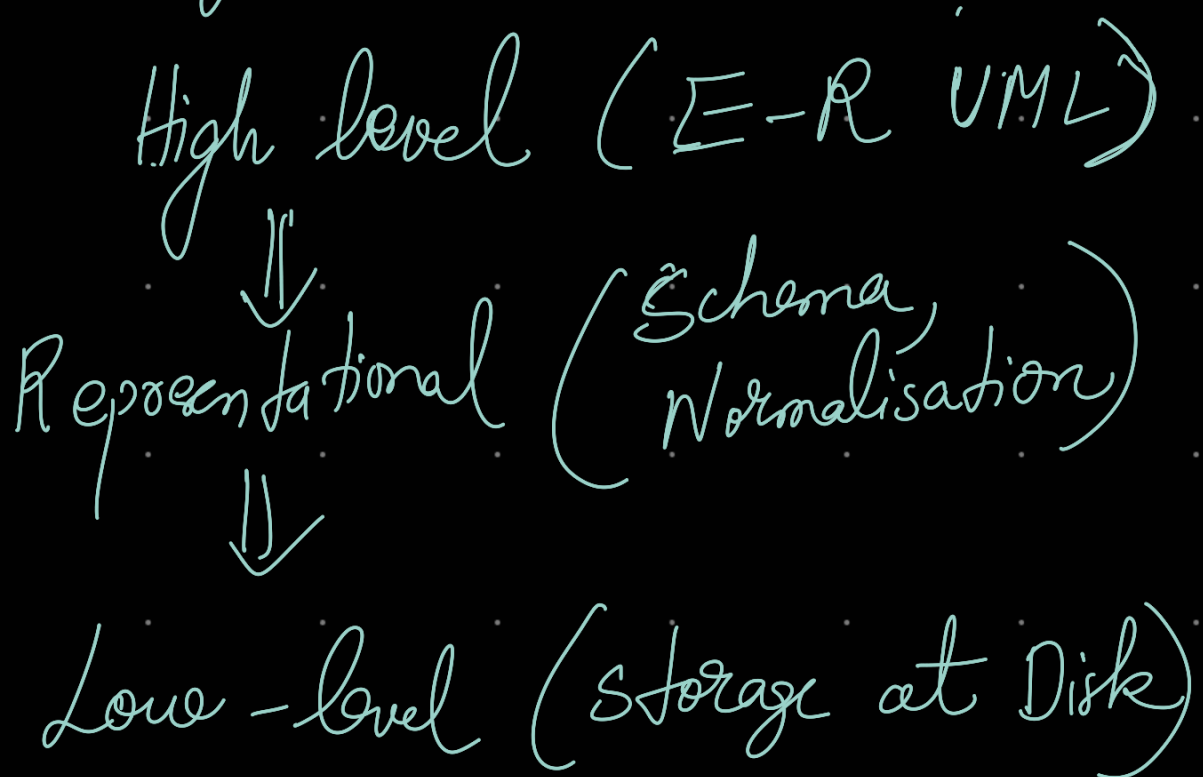
* Relational databases have tables to store records. How these records are stored physically is abstracted by DBMS.

* Physical structure of records in HDD in later sections.

Steps to Design Relational Databases

High level (E-R UML)
⇓
Representational (Schema, Normalisation)
⇓
Low-level (storage at Disk)

Database System architecture

naive users
(tellers, agents,
web users)

application
programmers

sophisticated
users
(analysts)

database
administrators

use

write

use

use

application
interfaces

application
programs

query
tools

administration
tools

compiler and
linker

DML queries

DDL interpreter

application
program
object code

DML compiler
and organizer

query evaluation
engine

query processor

buffer manager

file manager

authorization
and integrity
manager

transaction
manager

storage manager

disk storage

indices
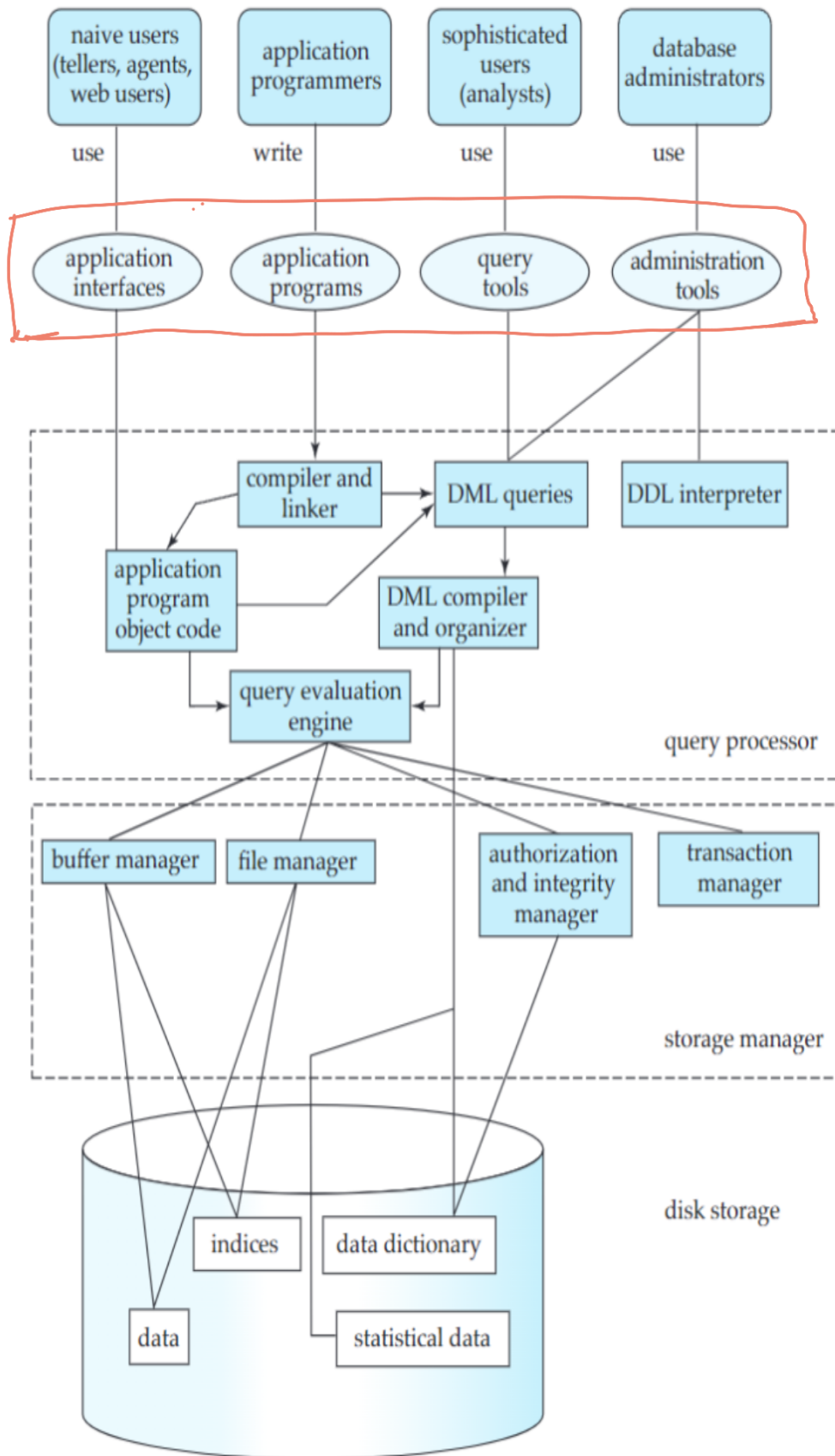
data dictionary

data

statistical data

Figure 1.5 System structure.

Famous Relational Databases

1. MySQL ⎤
2. PostgreSQL ⎦ → open source

3. Oracle

4. SQLite

5. MariaDB ——→ open source

6. Amazon Aurora

7. Ibm Db2

* All these database differs in implementation of various parts of DBMS shown above.

* Some focus on query processor, some focus on storage manager.
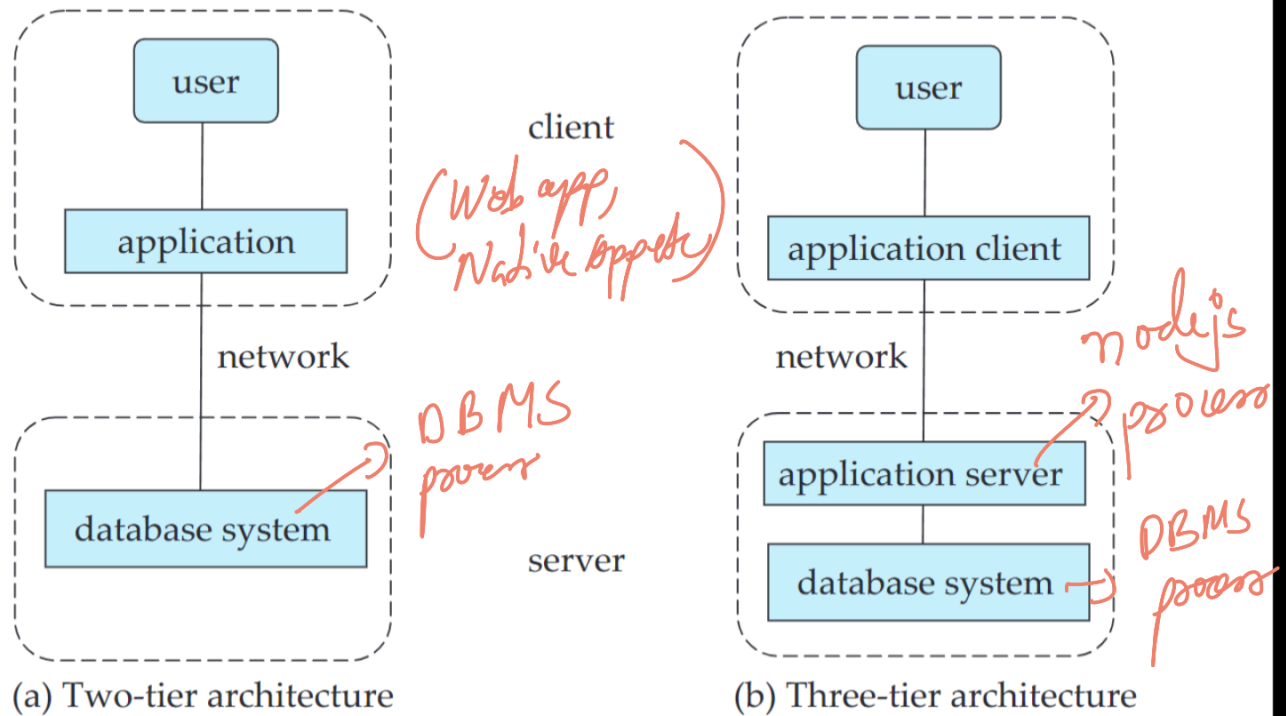
Two and Three Tier architecture

Annotations: client — (Web app, Native apps) — DBMS process — nodejs process — DBMS process

(a) Two-tier architecture

(b) Three-tier architecture

Figure 1.6 Two-tier and three-tier architectures.