

Database Administration

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Scope of DBA

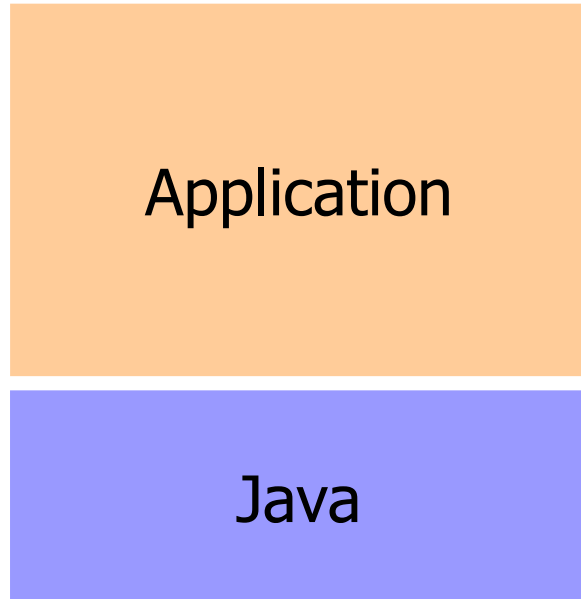
- What role? What tasks are performed?
- What skills are necessary?

Case study

- Manage invoices:
 - Add invoice
 - List invoices
- More operations:
 - List invoices for product
 - Top 10 products
- Assumption:
 - Large number of users

Customer X	# 123
prod. x	54
prod. y	21
prod. z	63
Total:	138

Java version



logical data model
logical operations
select algorithms
select physical data structures
distribution
concurrency control
provide algorithms
provide physical data structures

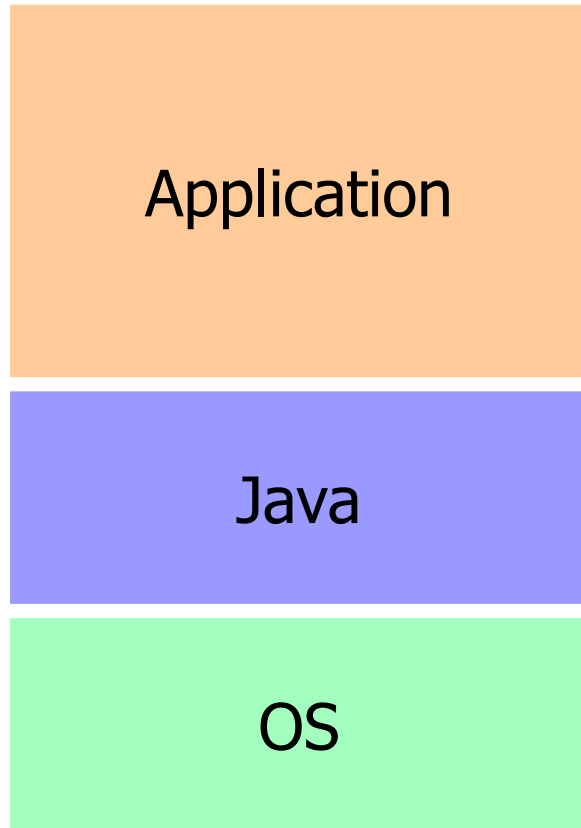
RDBMS version

logical data model
logical operations

Application

DBMS

Role and tasks



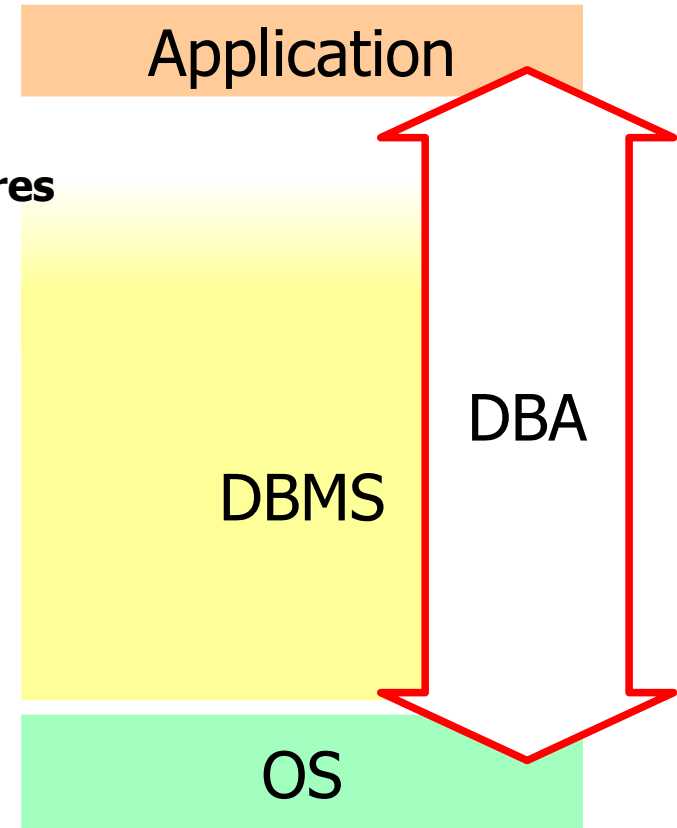
logical data model
logical operations

select physical data structures
distribution
select algorithms
concurrency control

provide algorithms
provide physical data structures

memory management
I/O

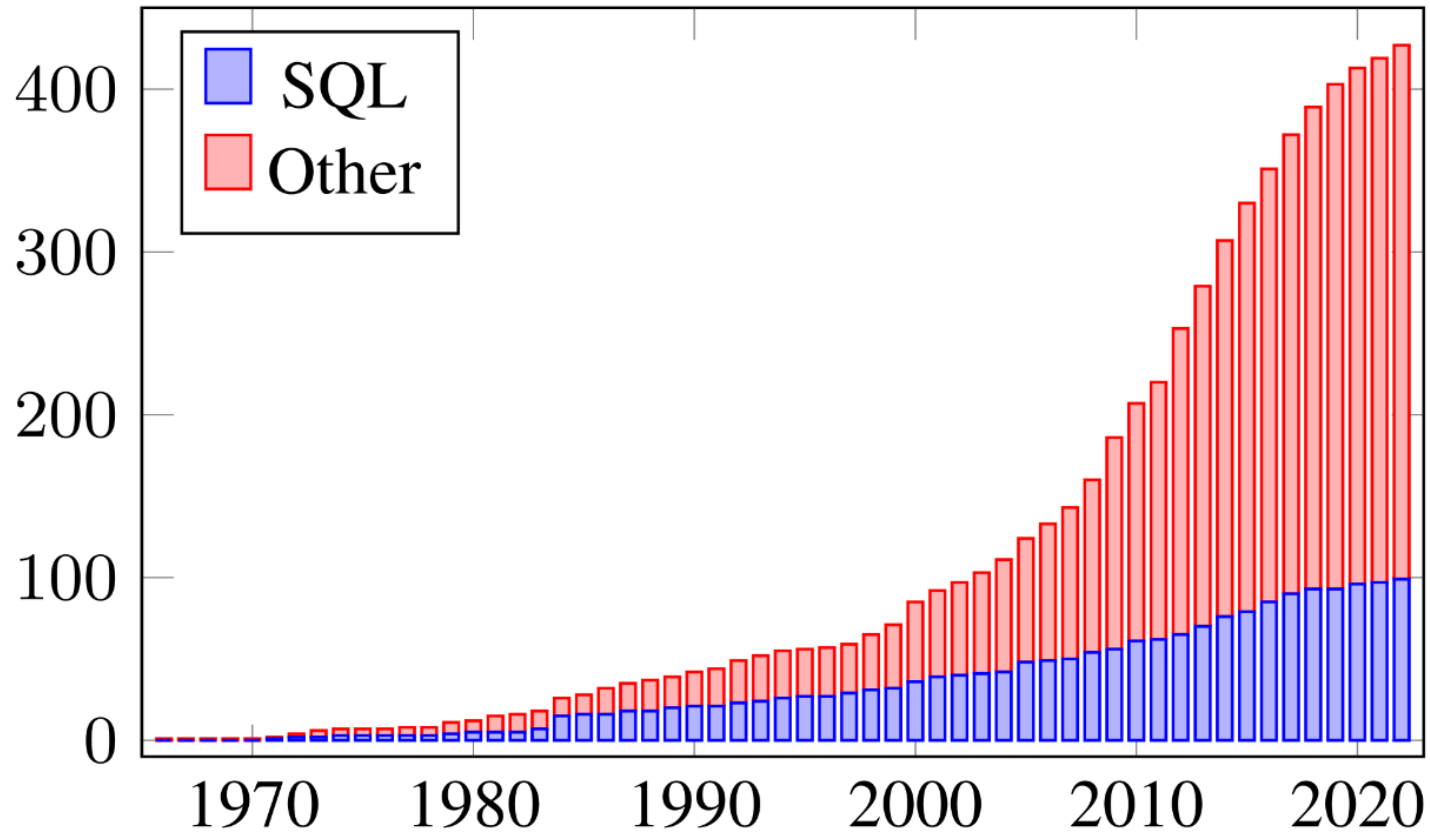
hardware abstraction



Role and tasks

- Application development:
 - Bridge the gap between the (high level) application and DBMSs
- Database operation:
 - Interaction with the OS
 - Backups, security, etc

Database systems

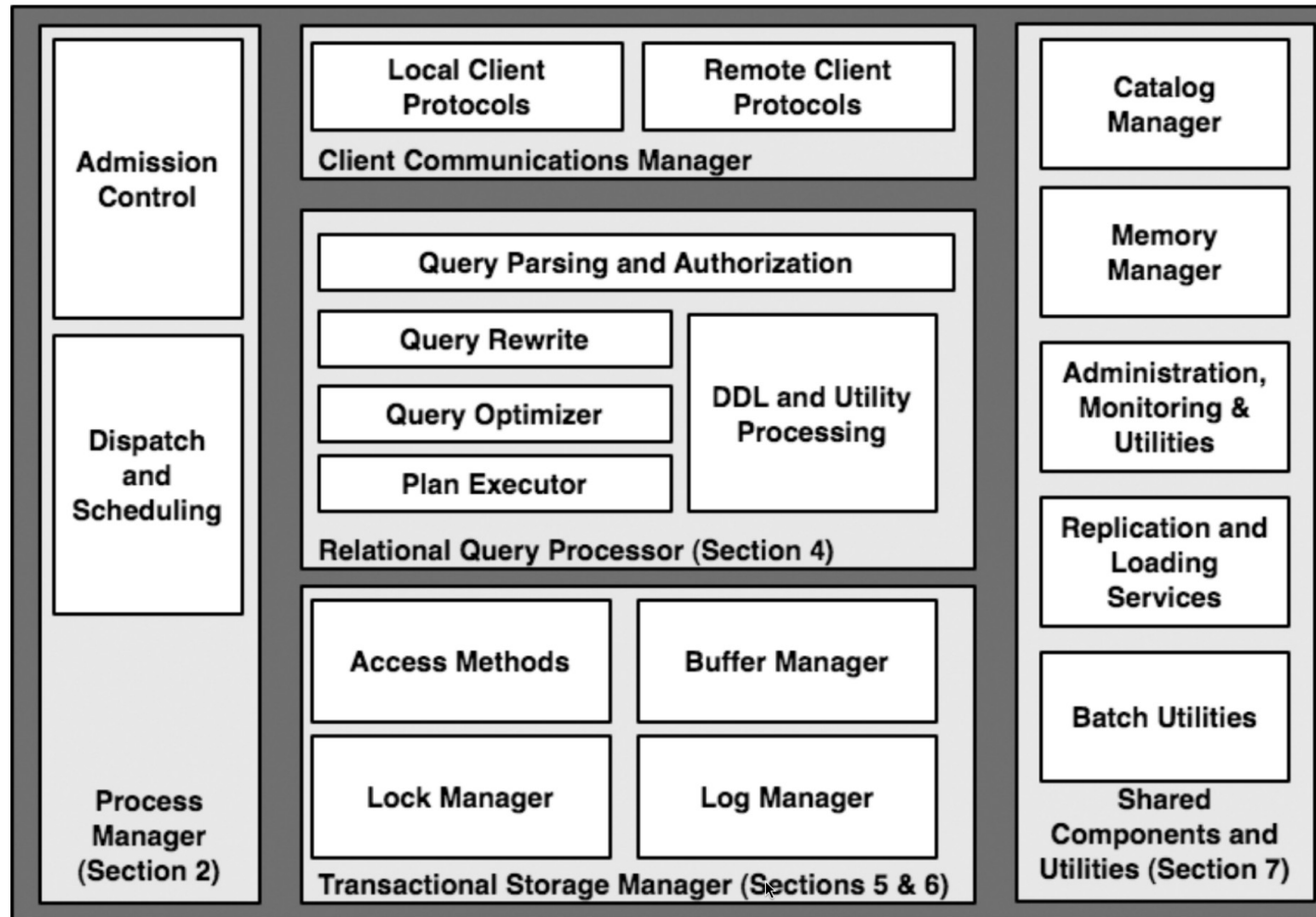


Source: <https://db-engines.com/>

Skills

- In-depth knowledge of DBMSs (plural!)
- Experimentation and deduction
- Ingenuity in problem solving

Architecture of a database system



Source: J. Hellerstein et al. Architecture of a Database System.

Roadmap

- Physical structures
- Query execution
- Redundancy
- Query optimization

} Relational

- Transactional recovery
- Transactional isolation

} ACID