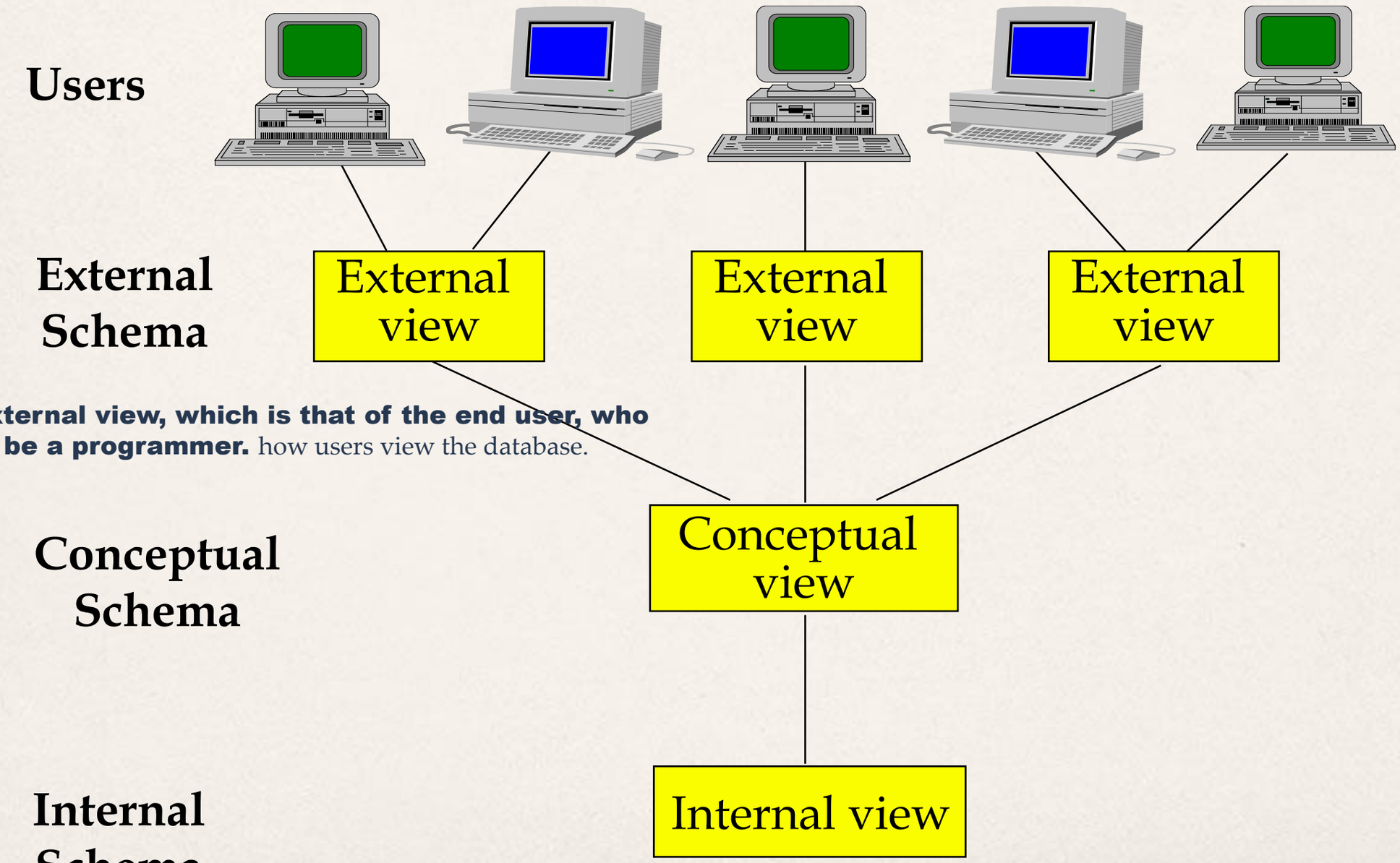
Architecture

- Defines the structure of the system
  - → components identified
  - → functions of each component defined
  - → interrelationships and interactions between components defined

The specification of the architecture of a system requires identification of the various modules, with their interfaces and interrelationships, in terms of the data and control flow through the system.

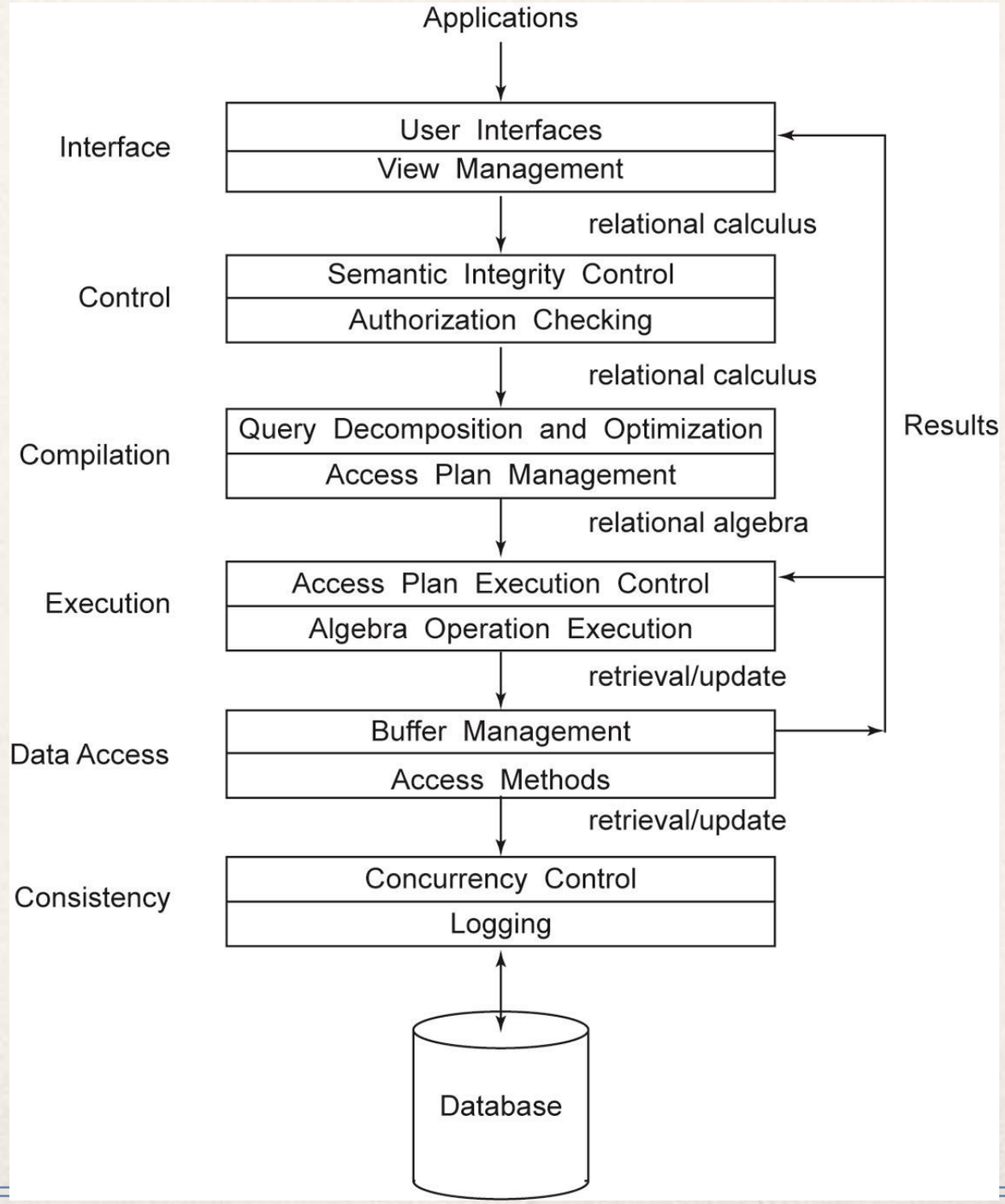
ANSI/SPARC Architecture



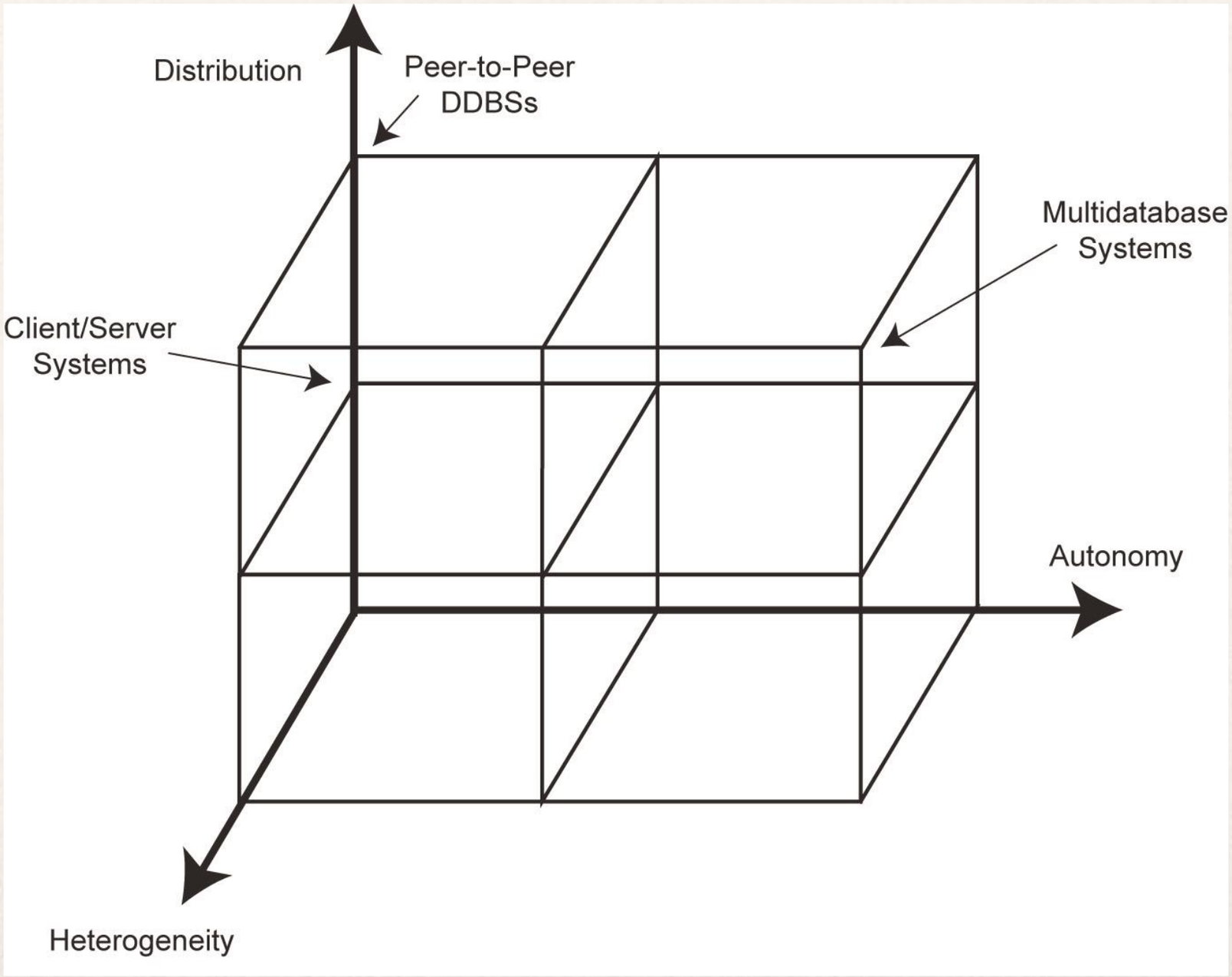
the external view, which is that of the end user, who might be a programmer. how users view the database.

the internal view, that of the system or machine. which deals with the physical definition and organization of data.

Generic DBMS Architecture



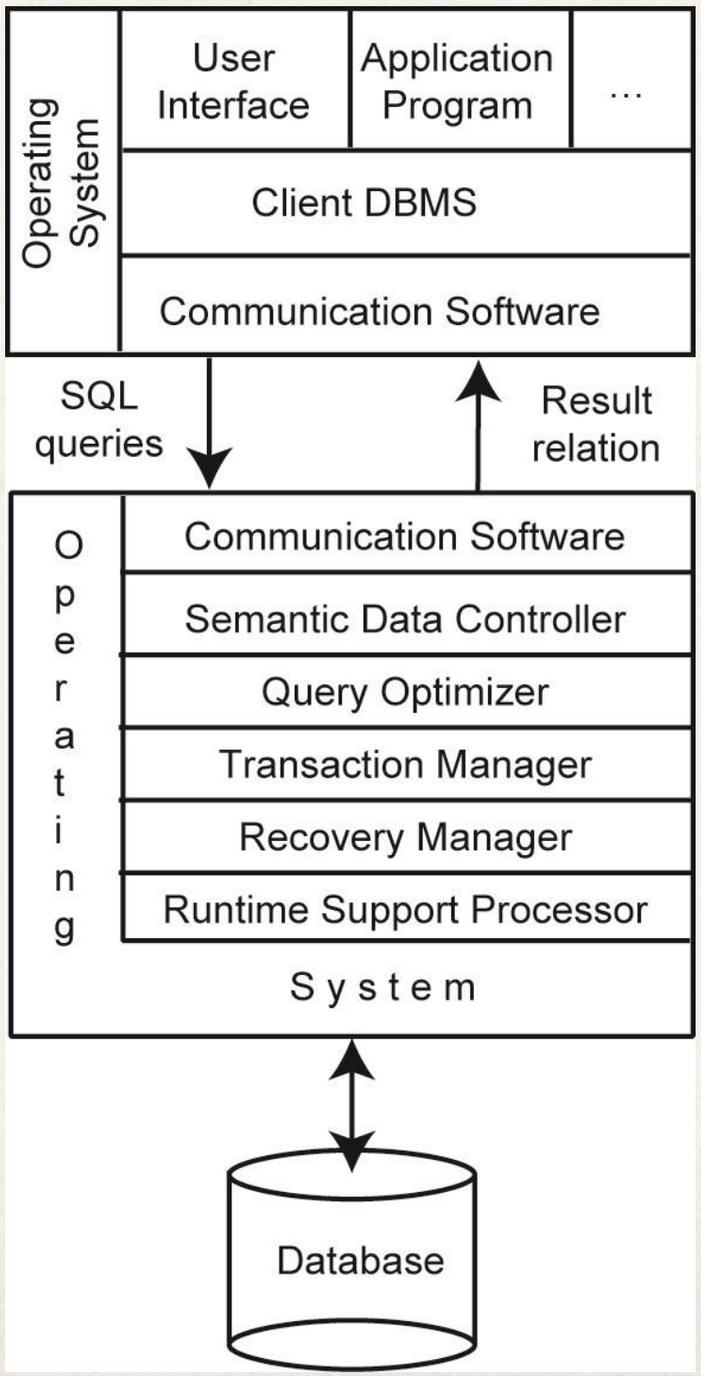
DBMS Implementation Alternatives



Dimensions of the Problem

- Distribution
  - Whether the components of the system are located on the same machine or not
- Heterogeneity
  - Various levels (hardware, communications, operating system)
  - DBMS important one
    - data model, query language,transaction management algorithms
- Autonomy
  - Not well understood and most troublesome
  - Various versions
    - Design autonomy: Ability of a component DBMS to decide on issues related to its own design.
    - Communication autonomy: Ability of a component DBMS to decide whether and how to communicate with other DBMSs.
    - Execution autonomy: Ability of a component DBMS to execute local operations in any manner it wants to.

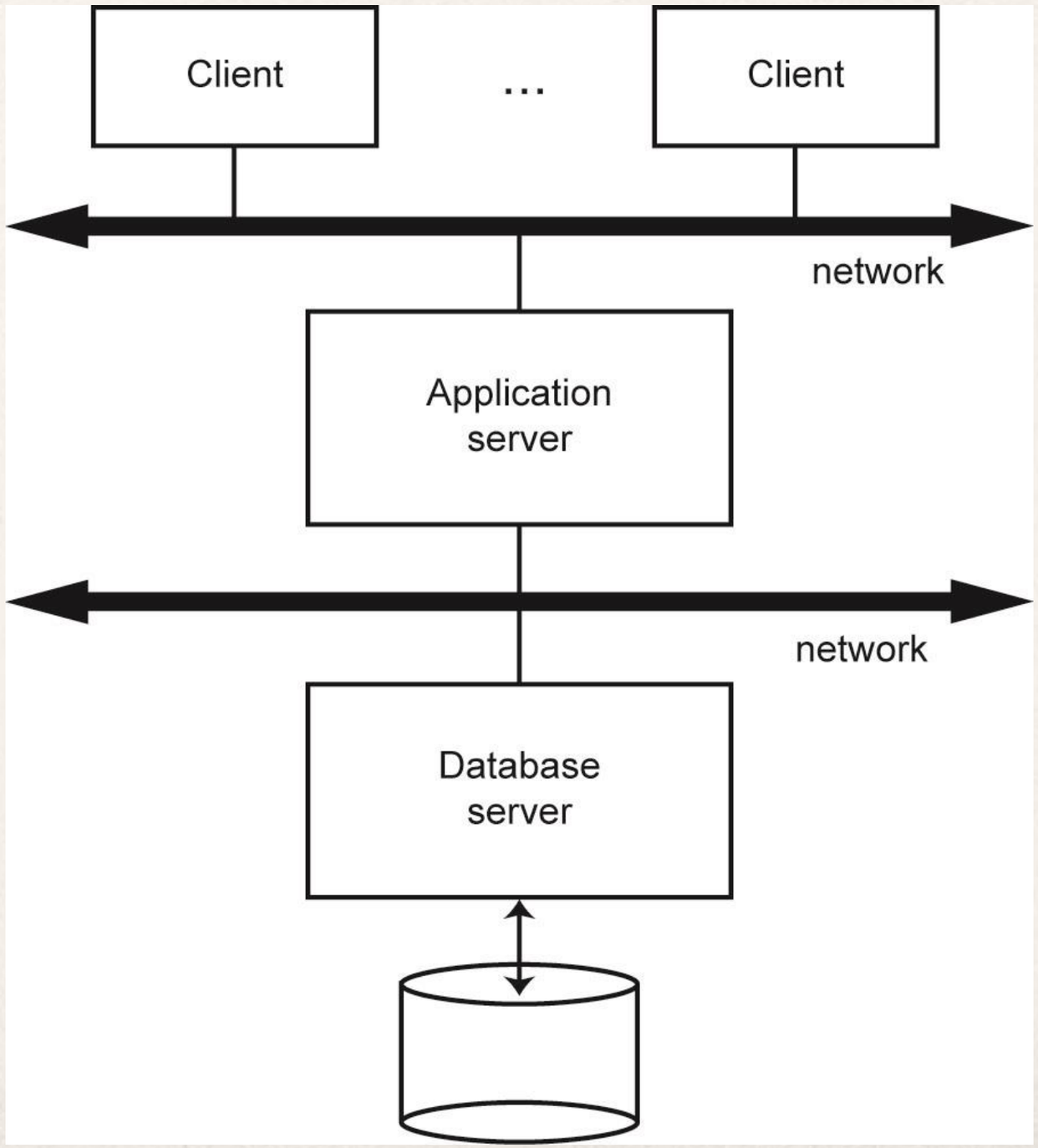
Client/Server Architecture



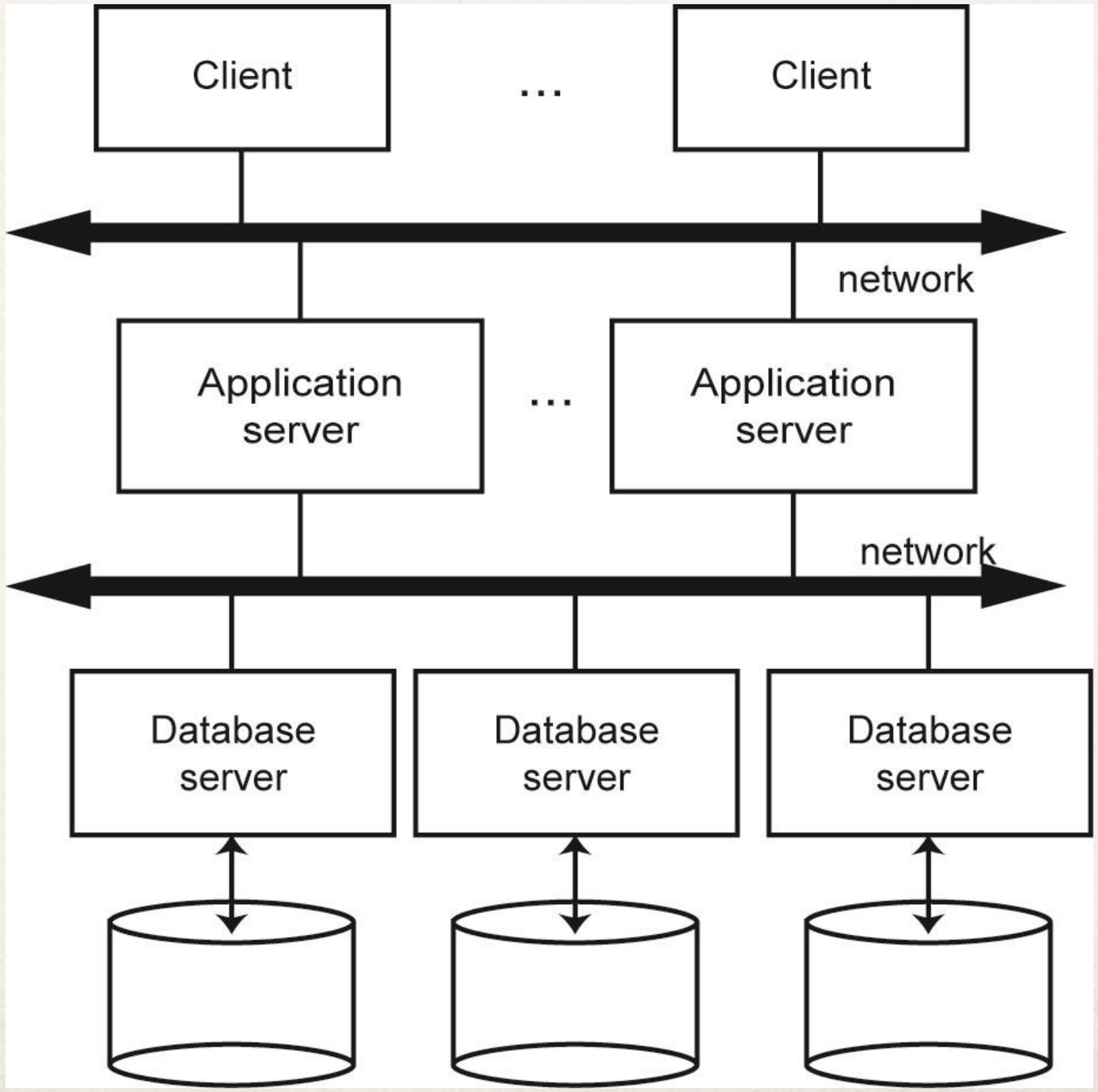
Advantages of Client-Server Architectures

- More efficient division of labor
- Horizontal and vertical scaling of resources
- Better price/performance on client machines
- Ability to use familiar tools on client machines
- Client access to remote data (via standards)
- Full DBMS functionality provided to client workstations
- Overall better system price/performance

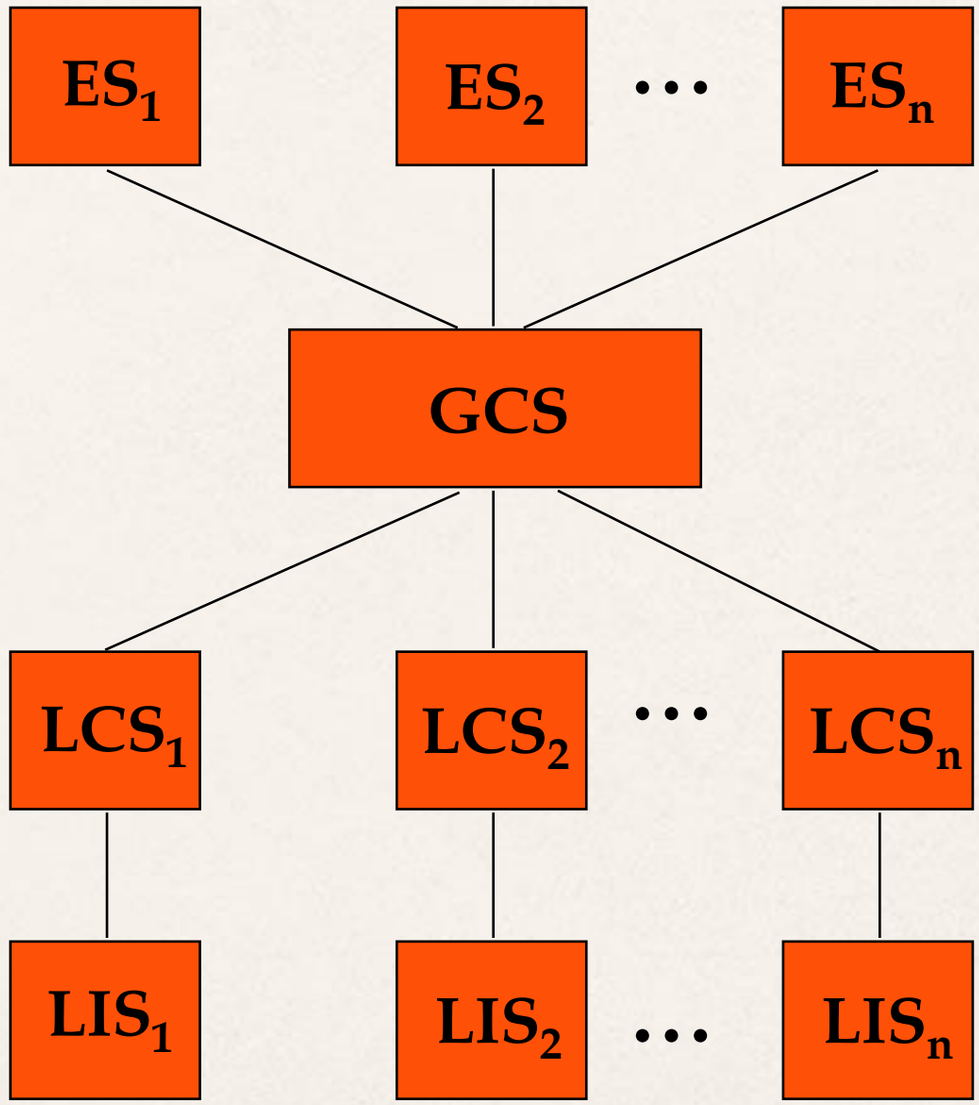
Database Server



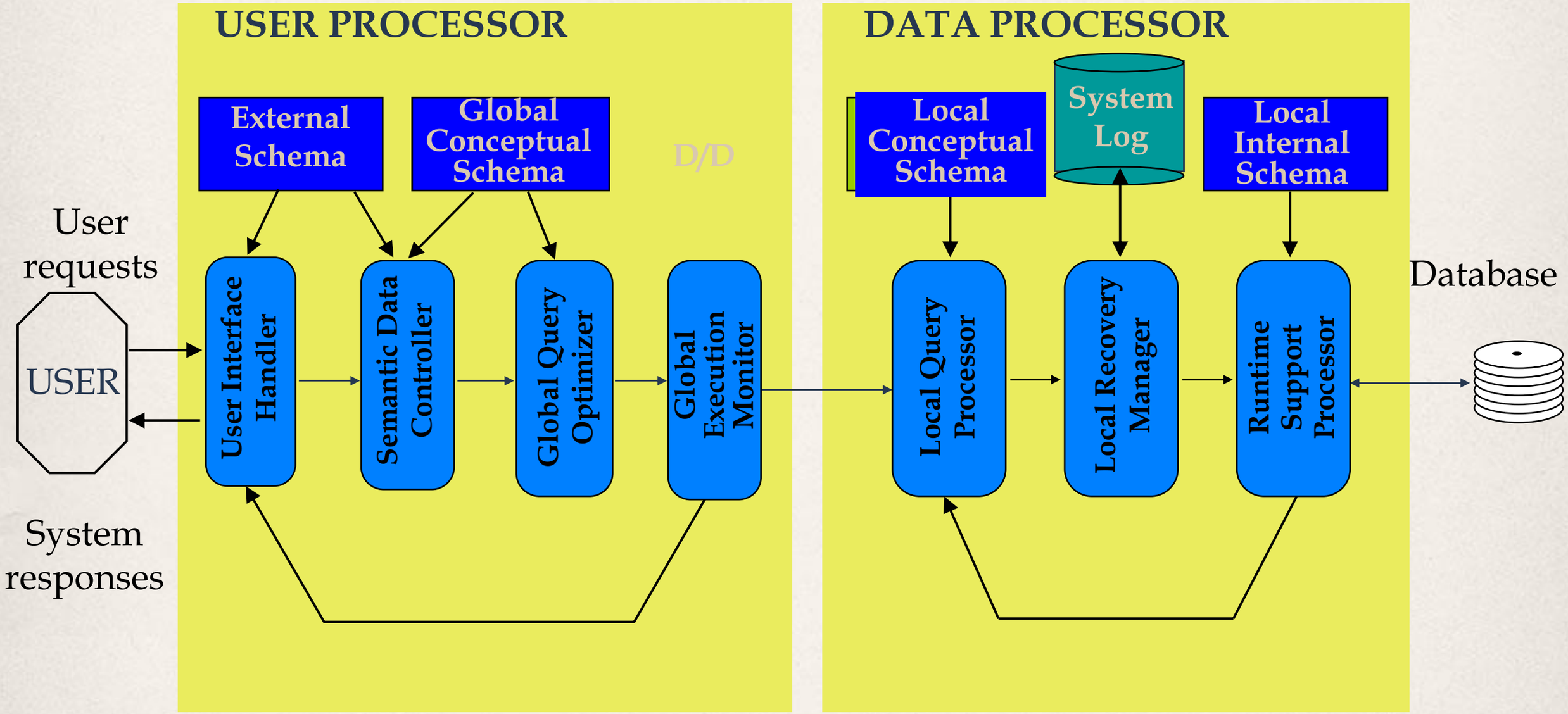
Distributed Database Servers



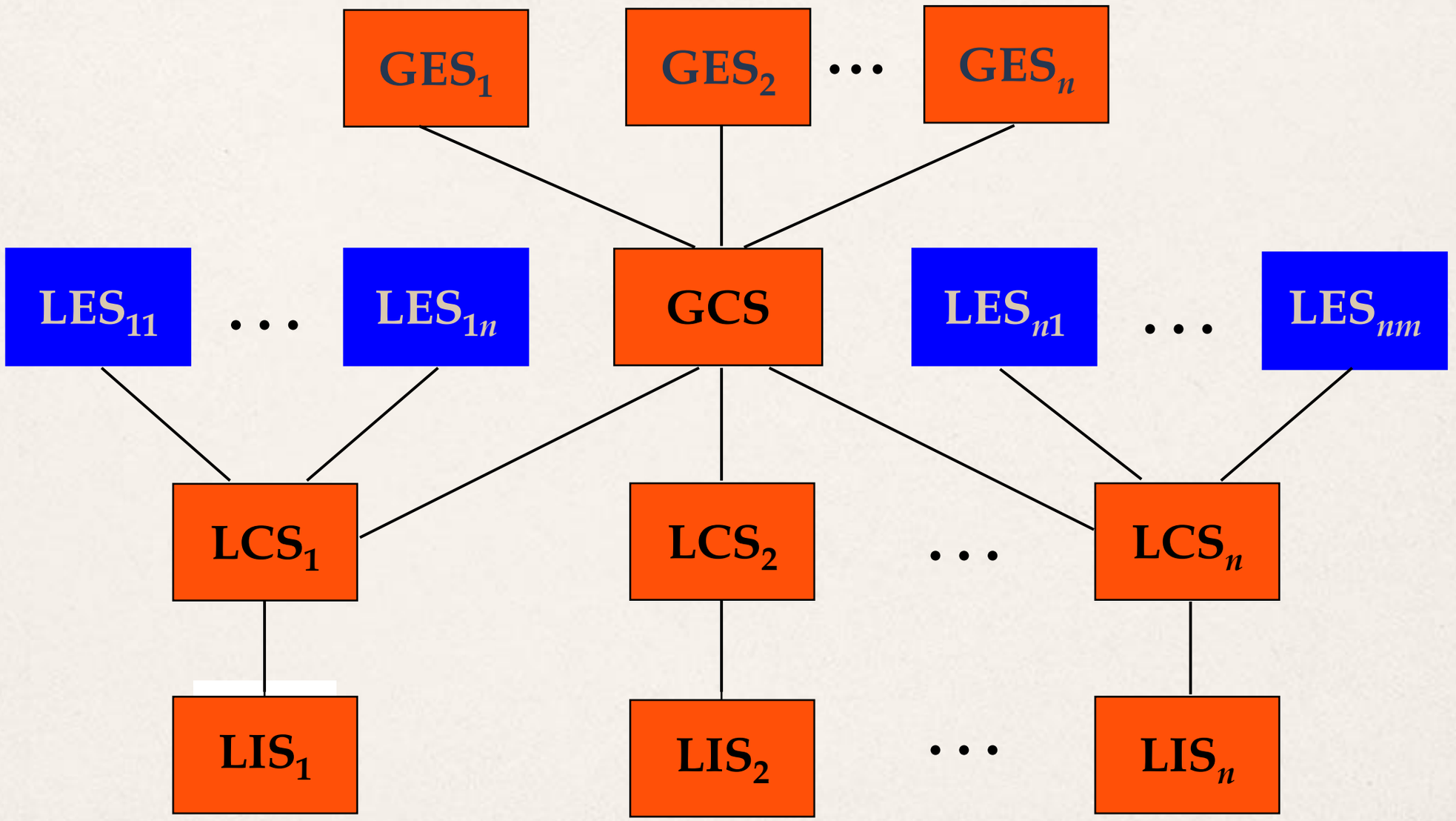
Datalogical Distributed DBMS Architecture



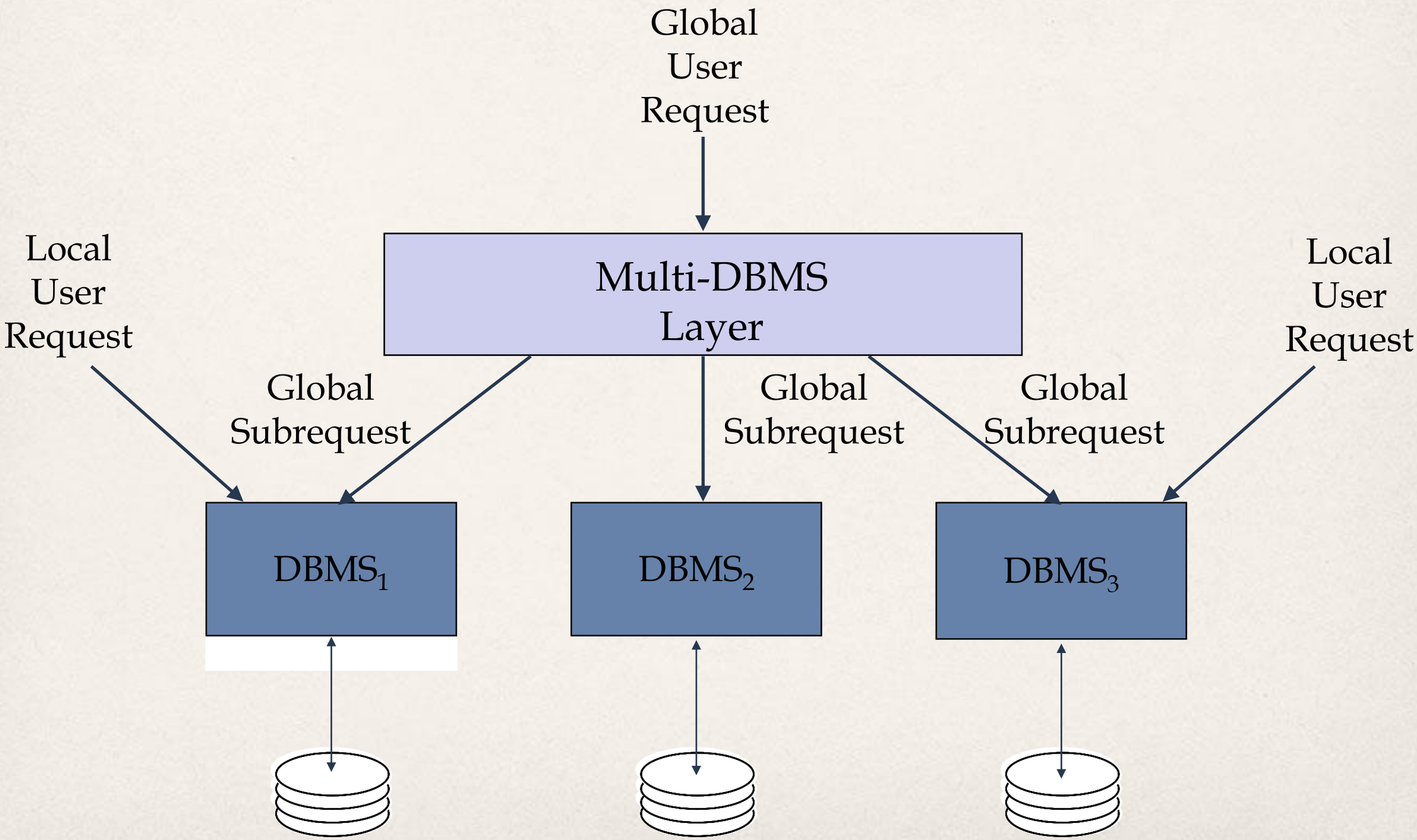
Peer-to-Peer Component Architecture



Datalogical Multi-DBMS Architecture



MDBS Components & Execution



Mediator/Wrapper Architecture