Data Mining

Data Warehouse and Mediator (Part A)

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Mediator and Data Warehouse

Query based search systems vs. mediators and data warehouses

Similarity - they both provide a query language.

Difference - Query based search systems use search engines as the backend while mediators and data warehouses employ a DBMS as the backend, which in turn interacts with the Web.

Advantages of query based search systems:
Users see the whole Web.

Advantages of data warehouses:
DBMS has benefits like security and querying facilities.

Disadvantages of data warehouses:
Users can only see data in DBMS, not the entire Web.

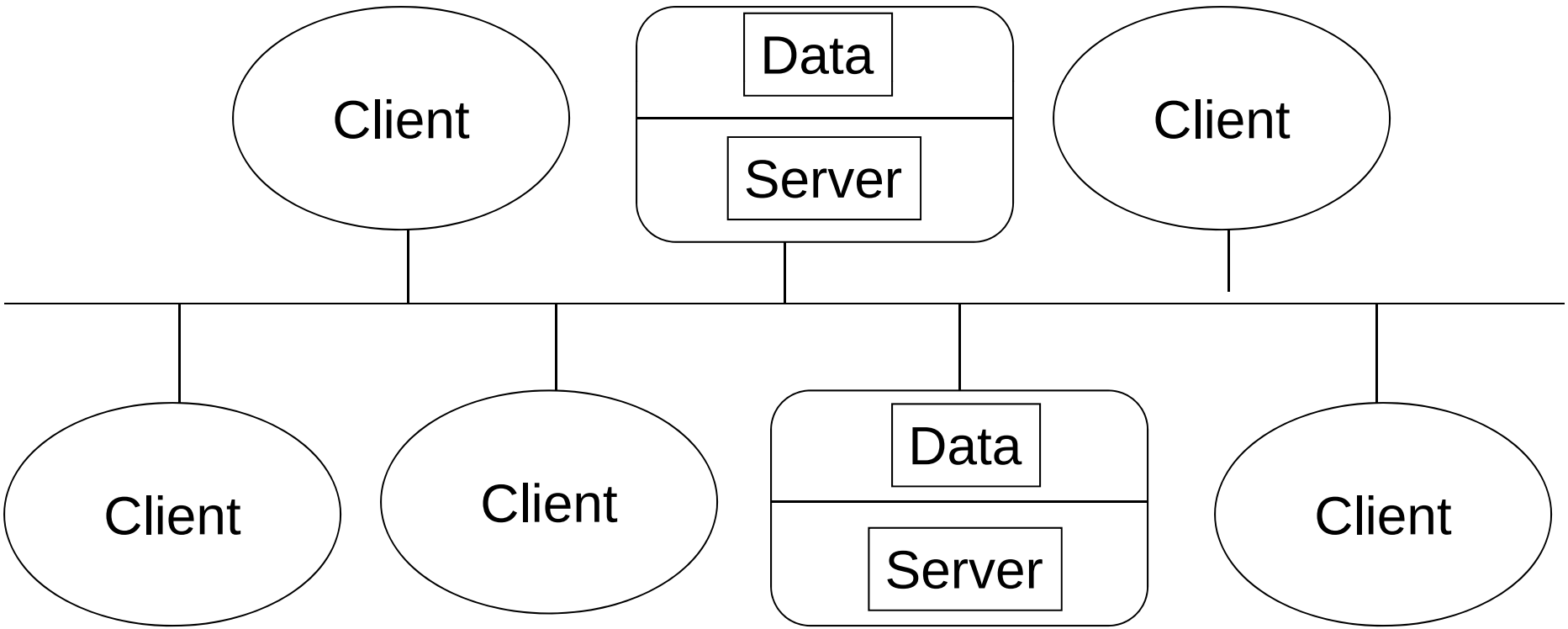
Data Warehouse, Mediator and Wrapper

Data warehouses - provide a centralized location to store data and process queries.

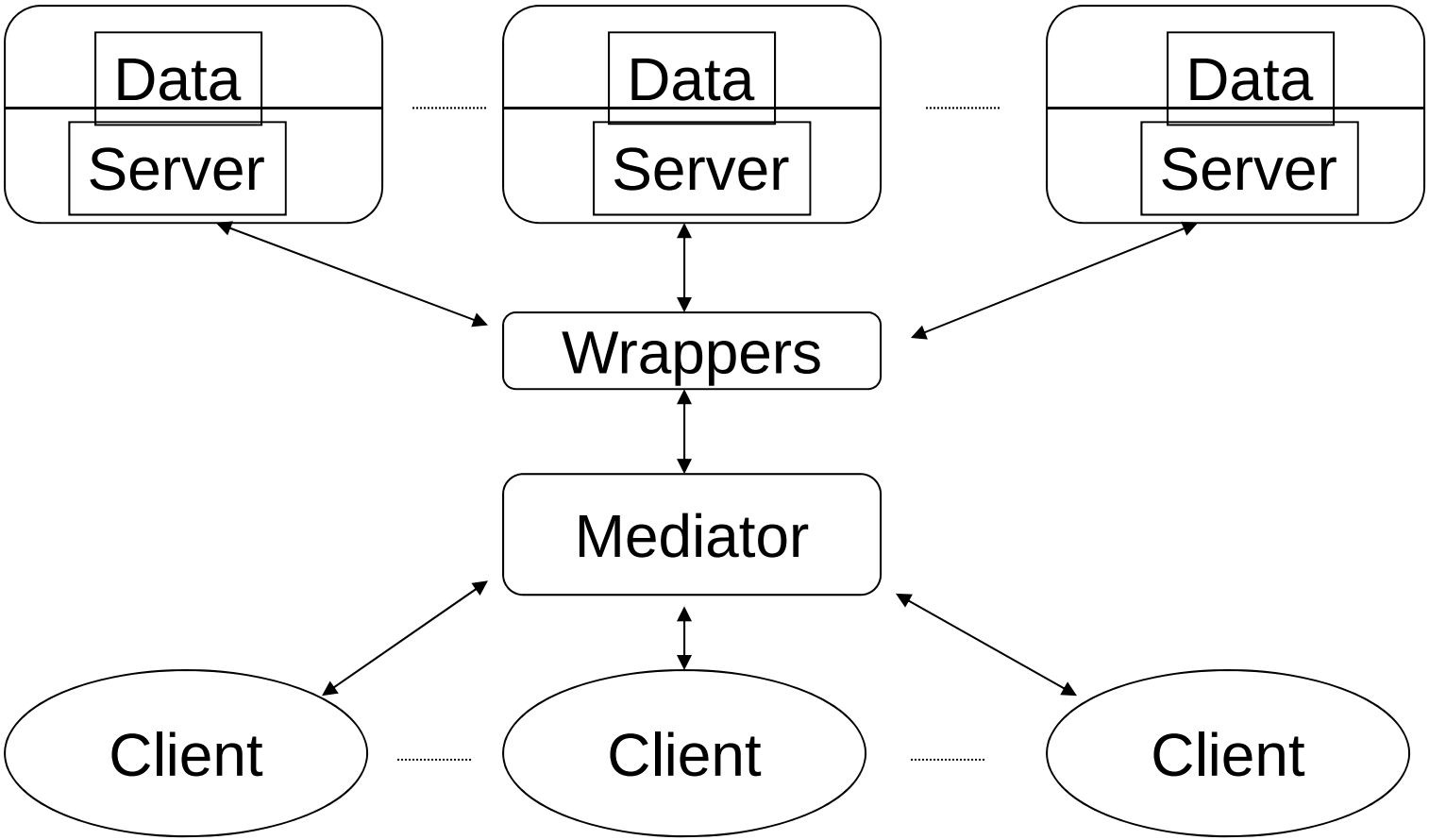
Mediators - provide a centralized location (with a small amount of data) for querying only.

Wrappers - used by both data warehouses and mediators to extract data from the Web, and filter and transform the Web data into suitable formats.

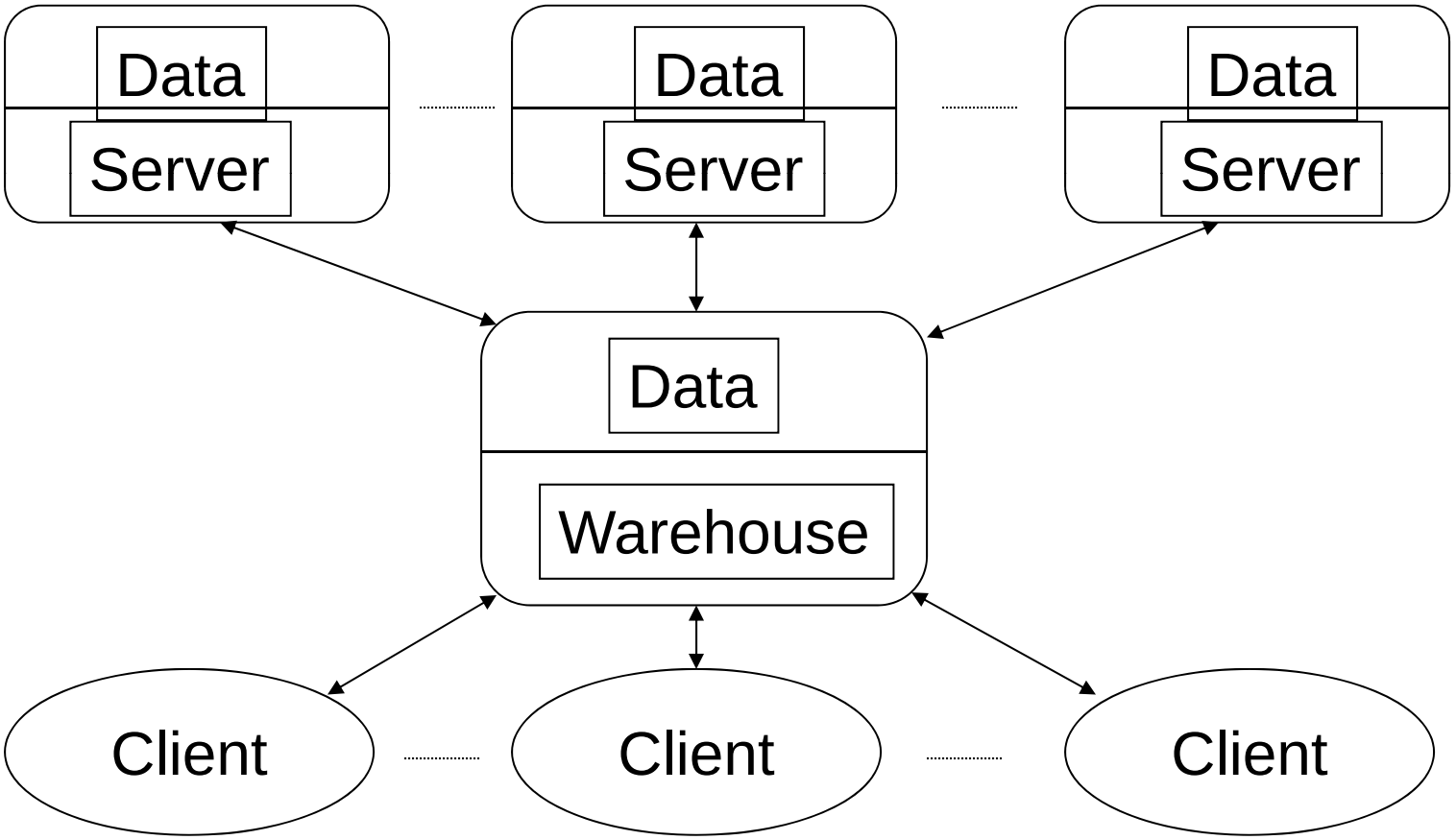
A Client/Server Architecture



A Mediator with Wrappers



A Data Warehouse Architecture



Data Warehouse: Its Definition

A data warehouse is a subject-oriented, integrated, time-variant, and nonvolatile collection of data in support of management's decision-making process.
— W. H. Inmon

Data Warehouse: Its Definition (cont.)

- Organizing data around major subjects, such as university majors, and focusing on modeling and analysis of data for decision makers, not on daily operations or transaction processing.
- Integrating data from heterogeneous data sources.

Data Warehouse: Its Definition (cont.)

Providing information from a historical perspective (e.g., past 3-6 years).

Physically containing data separate from its operational environment.

Requiring only initial loading of data and access of data, but no transaction processing, recovery, or concurrency control mechanisms.

OLAP

- Knowledge worker
- Decision support
- Subject-oriented
- Historical data
- Complex queries
- Query optimization
- 100 GB

OLTP

- Clerk
- Daily operations
- Application-oriented
- Current data
- Transactions
- Transaction processing
- 100 MB

Warehouse

- OLAP
- Complex OLAP queries
- Multidimensional view
- Aggregation and summarization of data from heterogeneous sources

DBMS

- OLTP
- Access methods
- Indexing
- Concurrency control
- Recovery

End of
Data Warehouse and Mediator Module (Part A)