Caching

↳ storing frequently accessed data in a location that is easily and quickly accessible

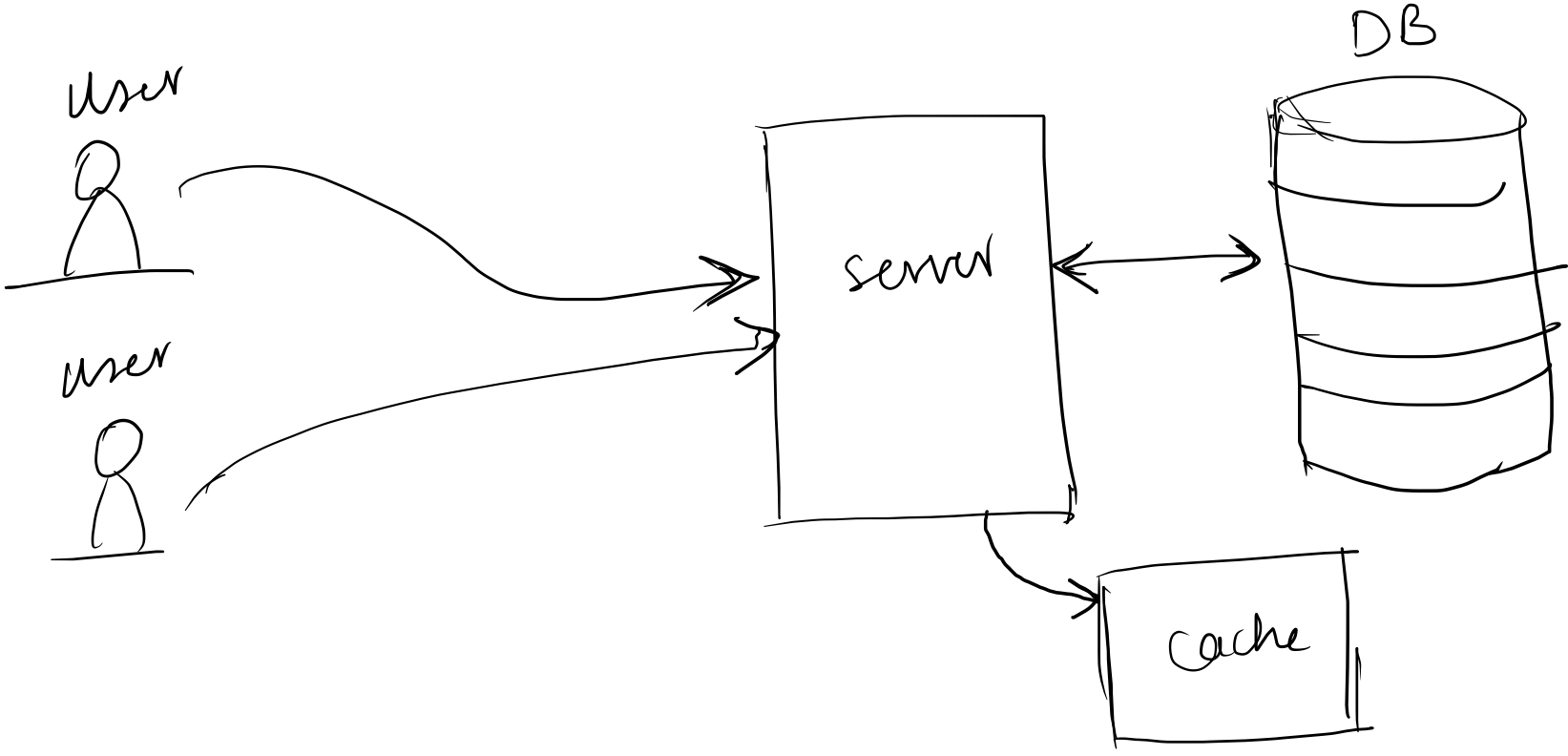
Caching

→ purpose is to improve the performance

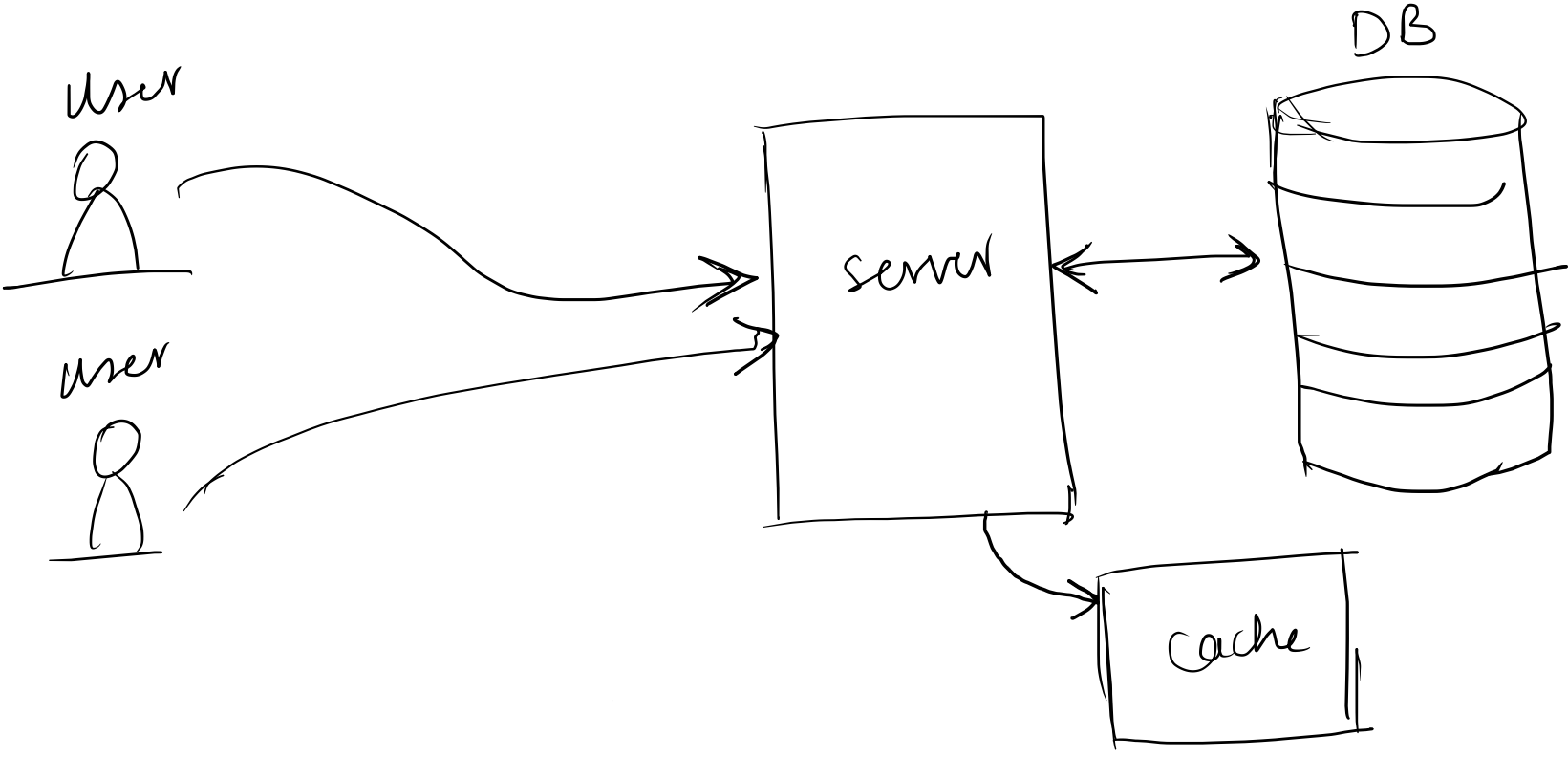
→ reduce the amount of time taken to access data.

→ data is stored closer to the user/application.

How caching works?



How caching works?



Working:

Cache memory is implemented by fast access hardware (RAM)

When data is requested

↳ first check in cache

(data is stored)

Yes

system retrieves data from cache

No

data retrieved from original source

Types of Caching

(i) Database caching

↳ frequently accessed queries

(internal cache is used for avoiding repeated queries)

database caching algorithm → stores key-value pair in hashtable

(2) Memory - caching

↳ Ram is directly used for storing the cached data.

③ Web-caching

Client-side

- caching on client-side
- web-browser caching

Server-side

- Resources are saved on the server side
- dynamic web pages

Advantages of cache

1. Reduces time to access data
2. Decreases load on the server
3. Increases efficiency
4. web page downloading/rendering speed increases

Disadvantages

1.) Cache algorithms are hard & complex to implement.

2.) Increases complexity of the application.

3.) High maintenance cost.

Cache - make your website load faster

cookies - user preferences and data

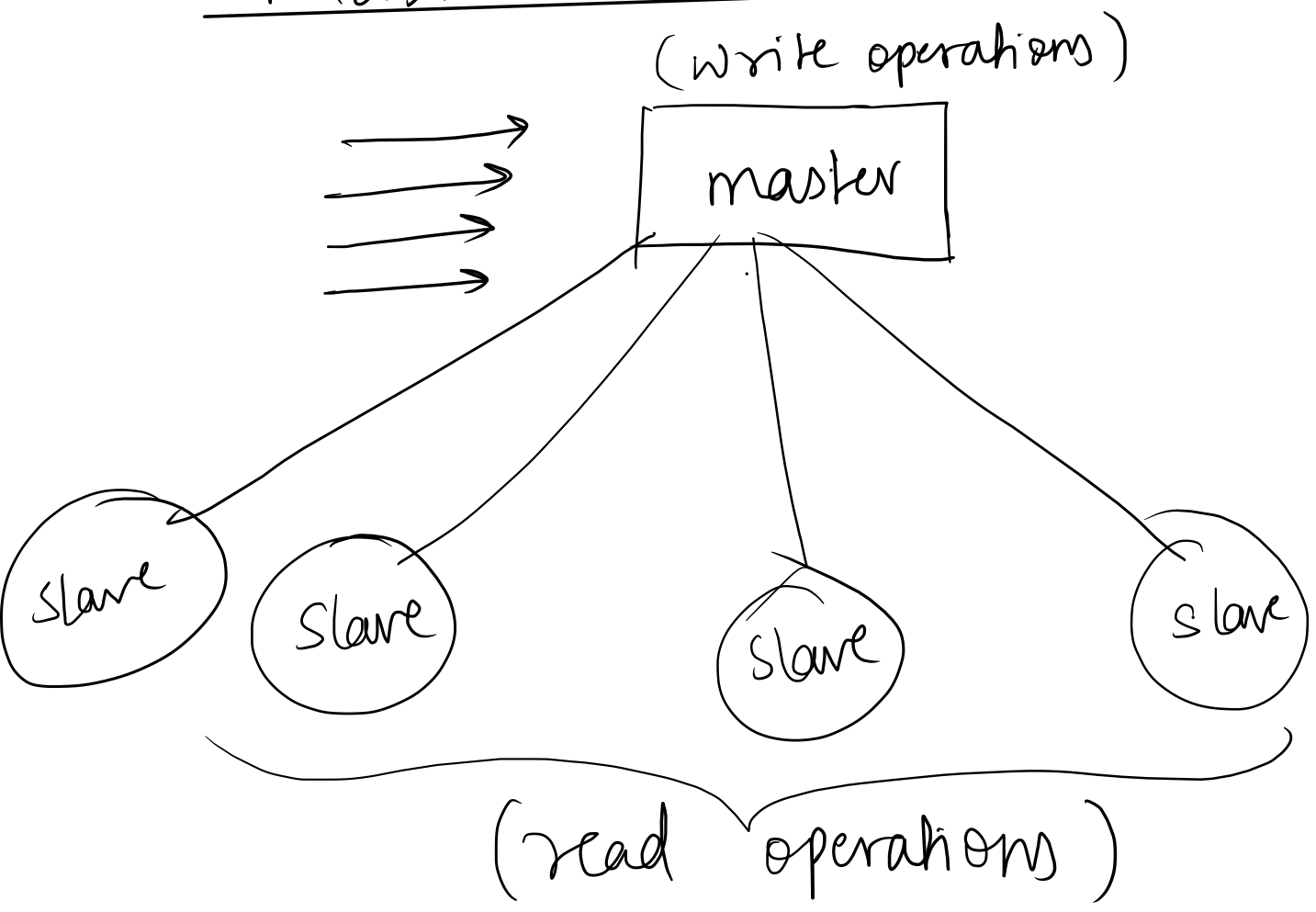
cache - make your website load faster

cookies - user preferences and data

Database

- Master-slave architecture
- Database Indexing
- Replication
- Database Partitioning
- Database Sharding

Master-slave Architechture



Advantages

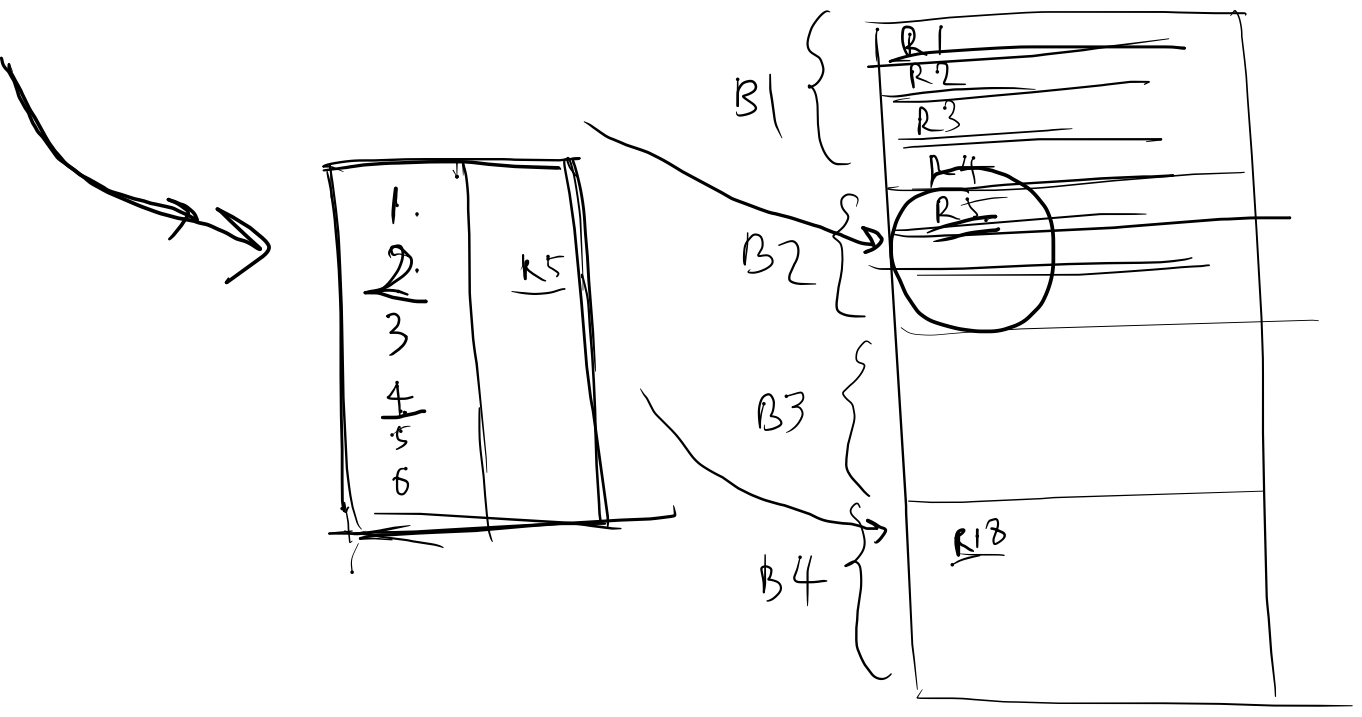
1. Produce backups
2. scaling application
3. Improves performance

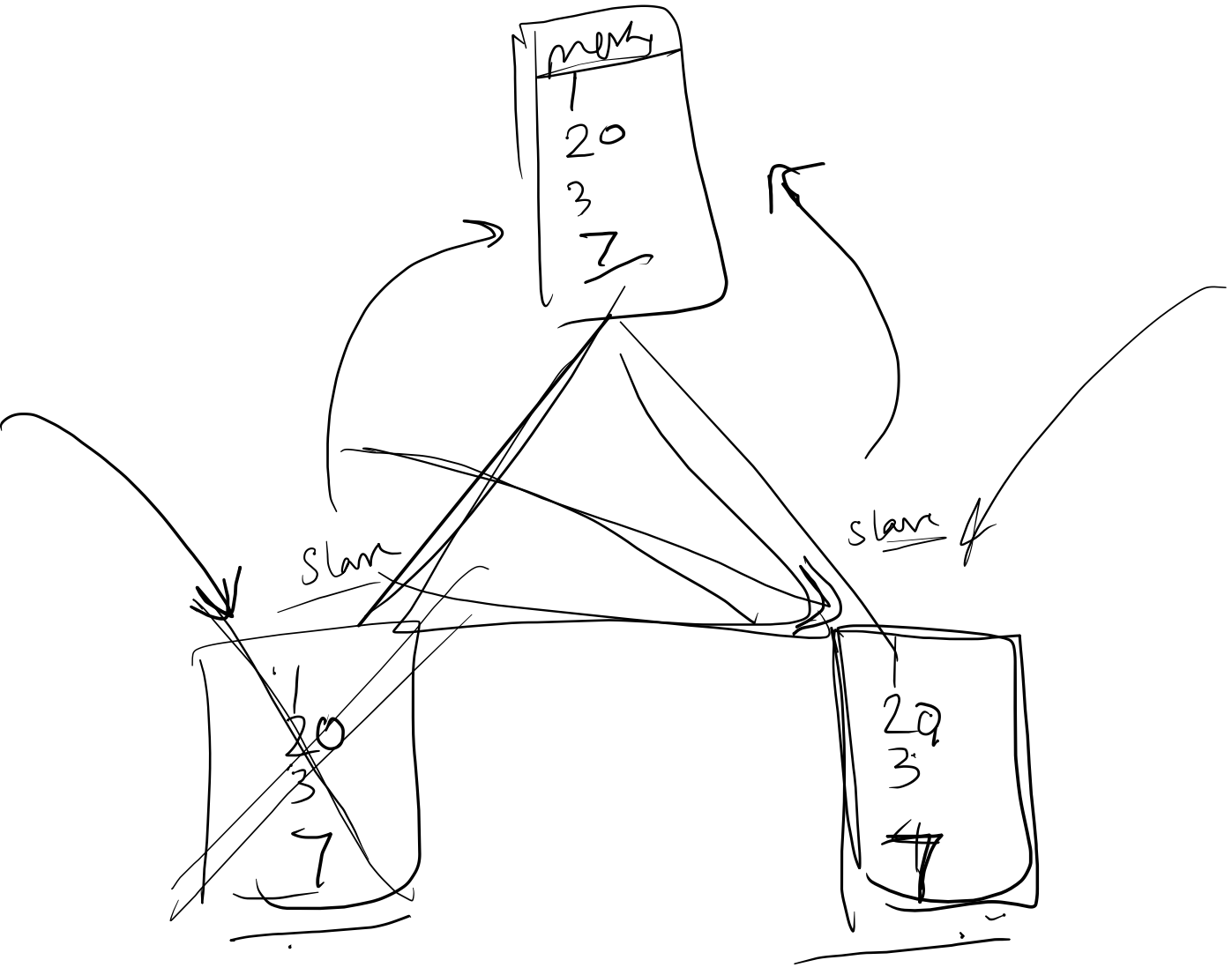
Disadvantages

1. write operations to master are hard to scale
2. No automated failover

Database Indexing

improves the database performance

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Advantages of Indexing

1.) Improves query performance (faster data retrieval)

2.) Efficient data access