







A database is a collection of persistent data that is used by the application system of some given enterprise.

- C.J. Date



Types of **Databases**

Classification

One way to classify databases involve banking, manufacturing, or insurance

- · An in-memory database is a datat time is critical, such as in telecomi
- An active database includes an ev provide active database features
- A cloud database relies on cloud t browser and Open APIs.
- Data warehouses archive data fro access to operational data. For ex
- data warehousing include extraction A deductive database combines lo
- A distributed database is one in w
- · A document-oriented database is · An embedded database system is
- maintenance.[21]
- End-user databases consist of dat them are much simpler than full-fle
- · A federated database system com DBMSs, possibly of different types
- Sometimes the term multi-databas application. In this case, typically I
- A graph database is a kind of NoS databases such as triplestores an
- · An array DBMS is a kind of NoSQ
- . In a hypertext or hypermedia data large amounts of disparate inform
- A knowledge base (abbreviated K representing problems with their s
- A mobile database can be carried Operational databases store detail
- demographic information about a parts inventory, and financial data

A parallal database cooks to impre

Depending upon the usage requirements,

1. Centralised database.

Distributed database.

3. Personal database.

4. End-user database.

6. NoSQL database.

Commercial database.

Operational database.

10. Object-oriented database.

8. Relational database.

9. Cloud database.

11. Graph database.

Types of **DATA**



- **Distributed Database** 01 It comprises of at least two documents situate
 - destinations either on a similar system or on a
- 02 A centralized database framework is a framew information in one single database at one sing
- Personal Database 03 Information is gathered and stored on PCs, wh quantity and can easily manageable.

Relational Database It is described by a set of tables from where data can be accessed. Relational database can store a large amount of information in a set of tables, which are linked to each other.

ctions of documer

Ope 05 An ope amount

04

- 06 In hie that li
- Clo 07 It is de as-a-Se

applica

NoSQL

- 08 It is a databa logic.
- No: 09 set of

Different types of Database

















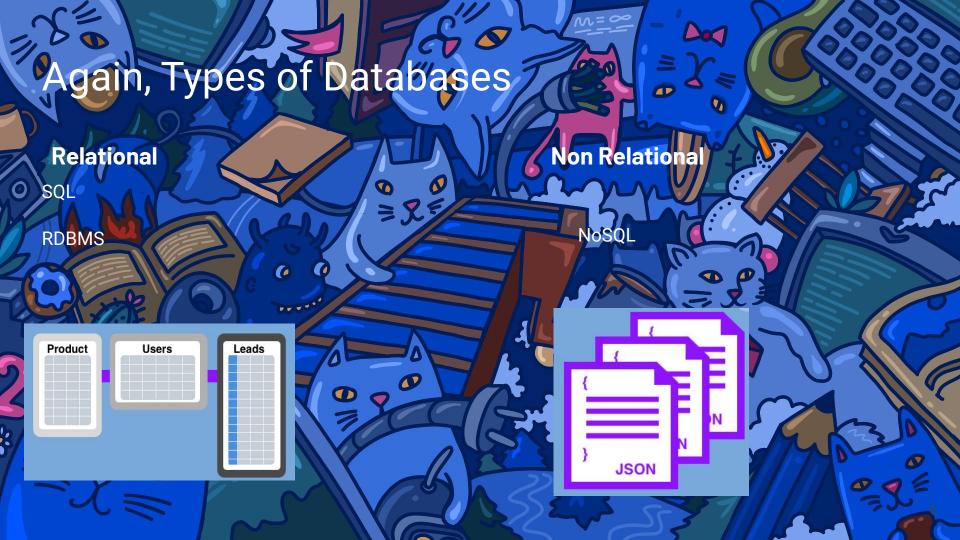




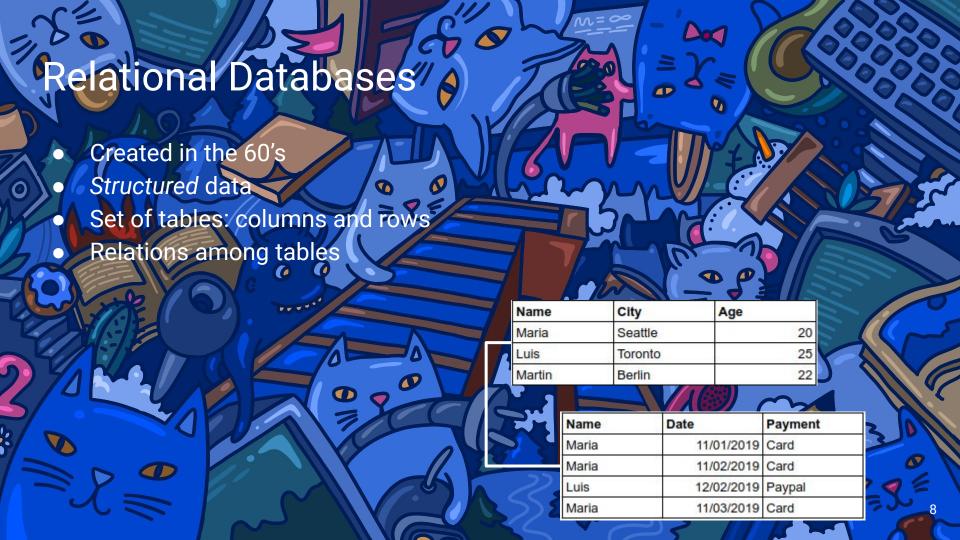
SYBASE

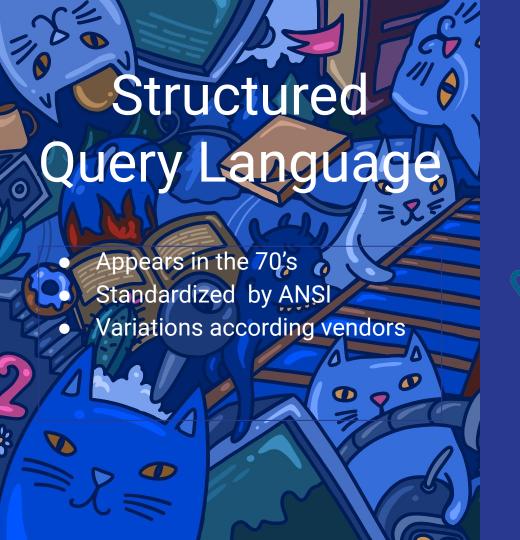
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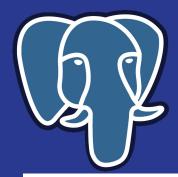




SELECT TOP 10 field FROM table



SELECT field FROM table WHERE ROWNUM <= 10



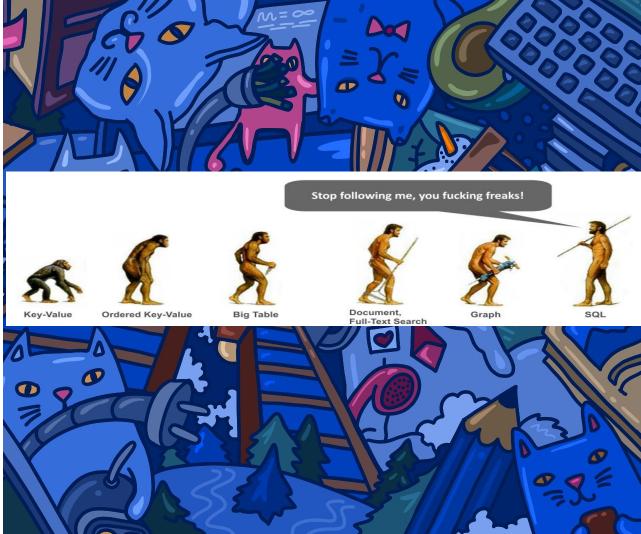
SELECT field FROM table FETCH FIRST 10 ROW ONLY

SELECT field FROM table LIMIT 10;



- Appears in the 90's
- Explodes in 2010
- Depends mostly on the vendor
- Different subtypes





Document





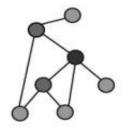




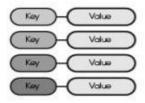




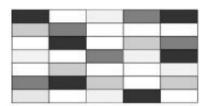
Graph



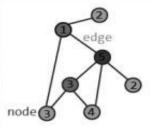
Key-Value

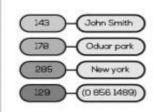


Wide-Column



{	
"us	ser":{
	"id":"143",
	"name": "improgrammer",
	"city": "New York"
	}
}	*





1	Fruit	A Foo	B Baz	
2	City	E DC	DIPLA	G FLD
3	State	AINZ	clcr	















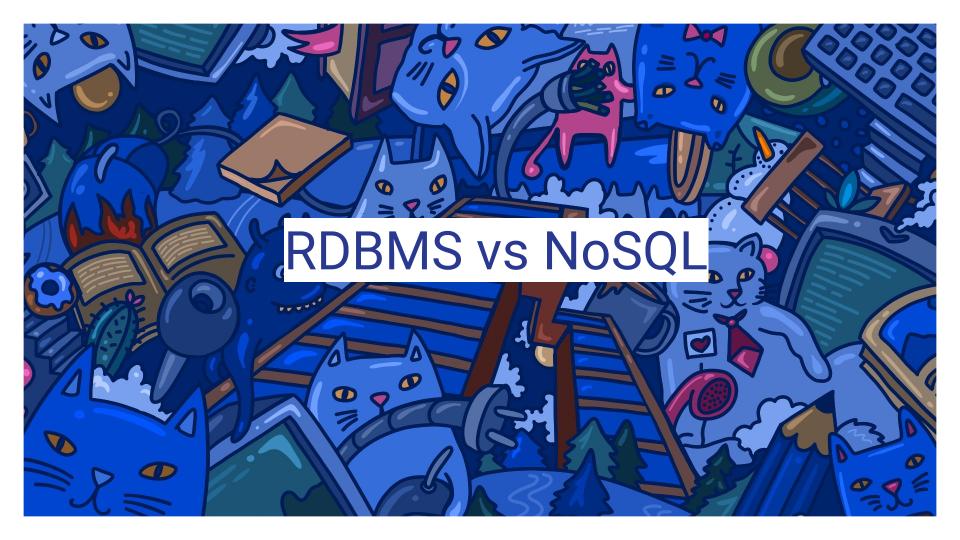




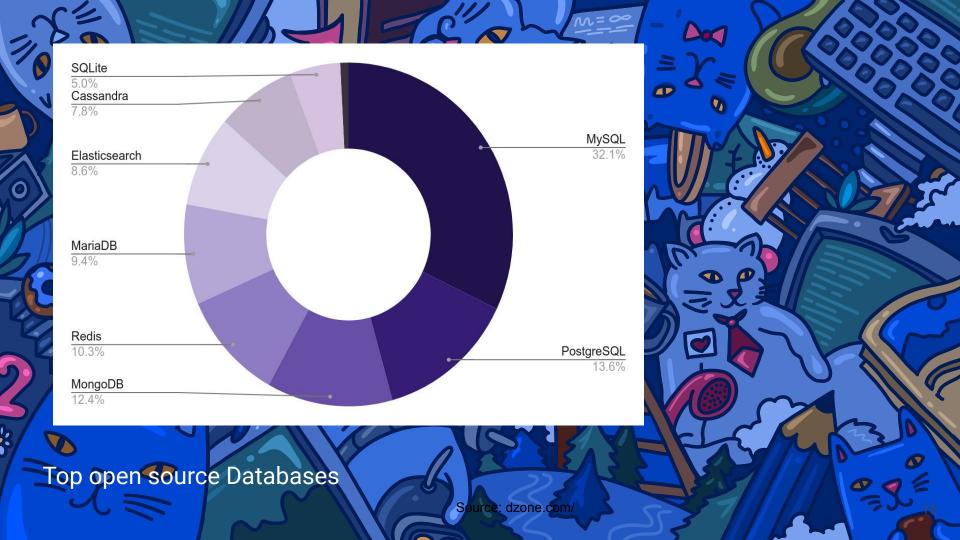


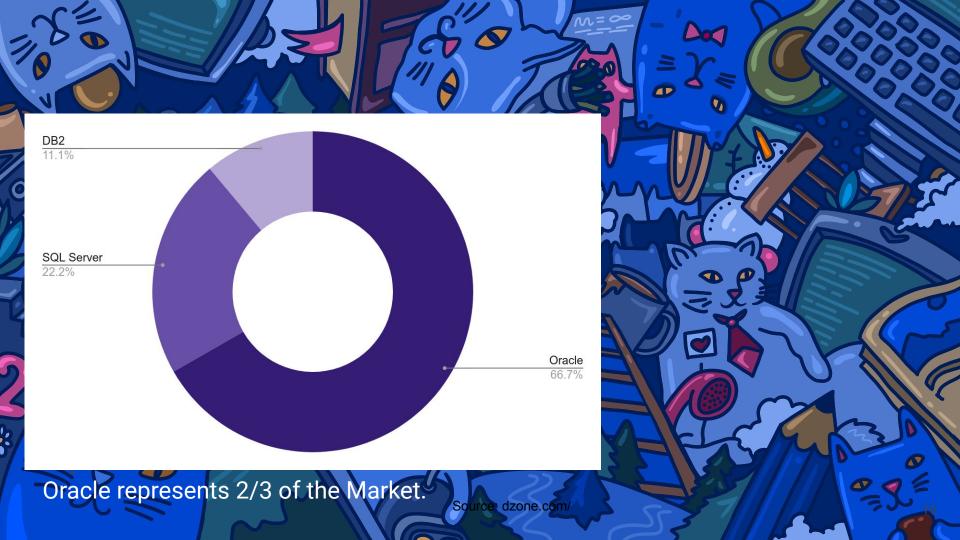












Relational vs NoSQL

Relational

- Requires a defined and structured schema
- Huge community supporting it
- Needs more managed scalability.
- SQL, transferable skills
- Many fantastic reporting tools
- Can offer performance problems for big data
- Support ACID

- Allows the persistence of any data in the "document"
- Small community
- Easy scalability
- No structured query language
- Few reporting tools that are difficult to standardize.
- Excellent performance on big data.
- Limited support for joins
- Data is denormalized, requiring mass updates



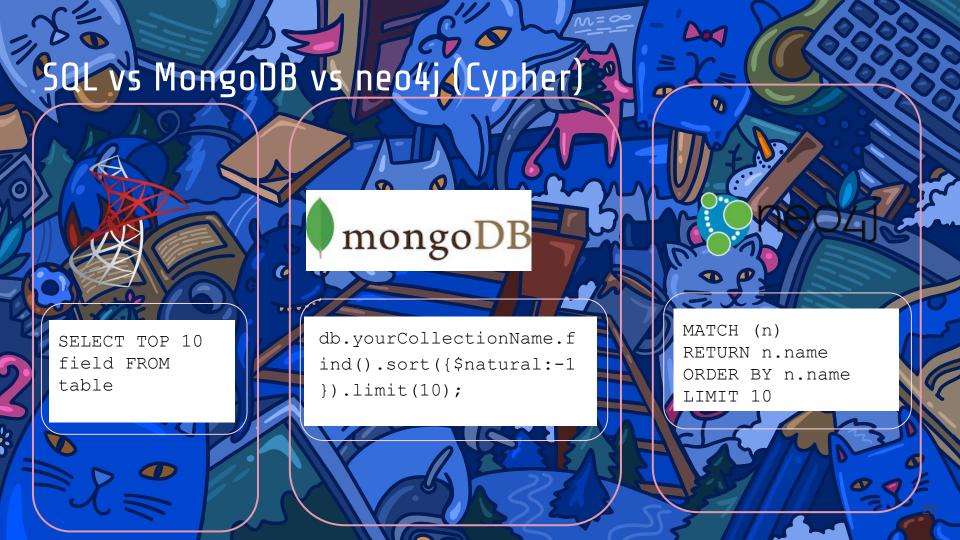


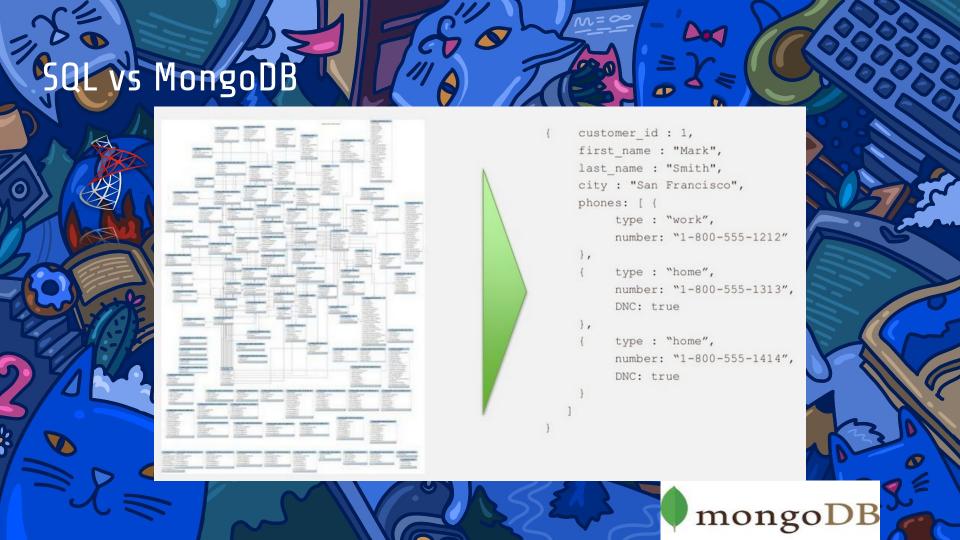
Relational vs Non Relational



Whereas relational databases chop up data, Document stores save documents as a single entity

```
"articles": [
  "title": "title of the article",
  "articleID": 1.
  "body": "body of the artricle",
  "author": "Isaac Asimov".
  "comments": [
         "username": "Fritz",
         "join date": "1/4/2014",
         "commentid": 1.
         "body": "this is a great article",
        "replies": [
                 "username": "Freddy",
                 "join date": "11/12/2013",
                 "commentid": 2,
                 "body": "seriously? it's rubbish"
         "username": "Stark",
         "join date": "19/06/2011",
         "commentid": 3.
         "body": "I don't agree with the conclusion"
```







SELECT name, author FROM books

name	author	
Ender's Game	Orson Scott Card	
Foundation	Isaac Asimov	
Neuromancer	William Gibson	
Consider Phlebas	lain M. Banks	
Revelation Space	Alastair Reynolds	

Couchbase

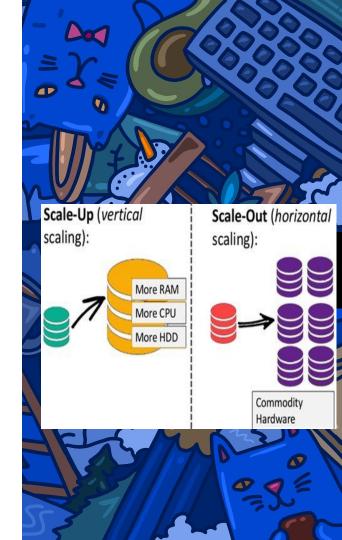
SELECT name, author FROM books

Selection requirements

Relational

- Medium-to-large-scale databases
- Fairly low concurrency
- ACID is a must
- Data highly correlated
- Big need of complex reporting
- Vertical scaling needed

- Large scale db
- High concurrency
- ACID can be relegated
- No need for an static escheme
- Freedom in changes during development
- Horizontal scaling is needed



Common uses

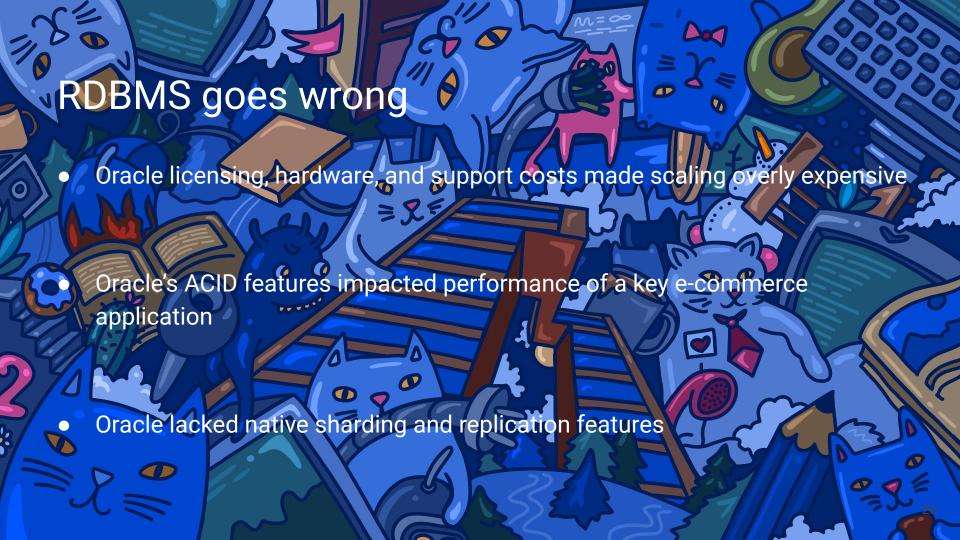
Relational

- Accounting, finance
- Banking systems
- Transaction management systems

- Mobile apps
- Real-time analytics
- Content management
- Personalization
- IoT apps





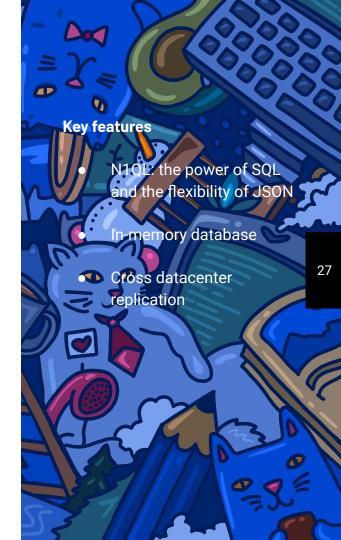


Couchbase to the rescue

Ebay implemented Couchbase server in 2014.

Outcames

- Linear scalability and high read/write throughput keep applications highly responsive even as users increase
- Location-aware low latency querying boosts performance for 110B
 Couchbase calls per day
- Auto-sharding distributes data evenly across nodes, while cross datacenter replication keeps sites highly available
- Flexible schema increases developer agility







Bitcoin exchange shut down in March 2014

 Flaw in the code which allows transfers between flexcoin users.

 Sent thousands of simultaneous requests until the sending account was overdrawn, before balances were updated.



 Bitcoin exchange attacked in March 2014

 Vulnerability in the code that takes withdrawals.

 Placed several simultaneous withdrawals which resulted successful even though there was no real funds to cover.





Understand your data and business needs

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