# Presentation
NoSQL

Database

By: xbi Jul.2020

What is NoSQL

- Stands for <u>N</u>ot <u>O</u>nly <u>SQL</u>. Term was redefined by Eric Evans after Carlo Strozzi.

- Class of non-relational data storage systems.

- Do not require a fixed table schema nor do they use the concept of joins.

- Relaxation for one or more of the ACID properties (*Atomicity, Consistency, Isolation, Durability*)

(typically) NoSQL is . . .

- Non-relational
- Distributed
- Horizontally scalable
- Big data
- Performant
- Open source
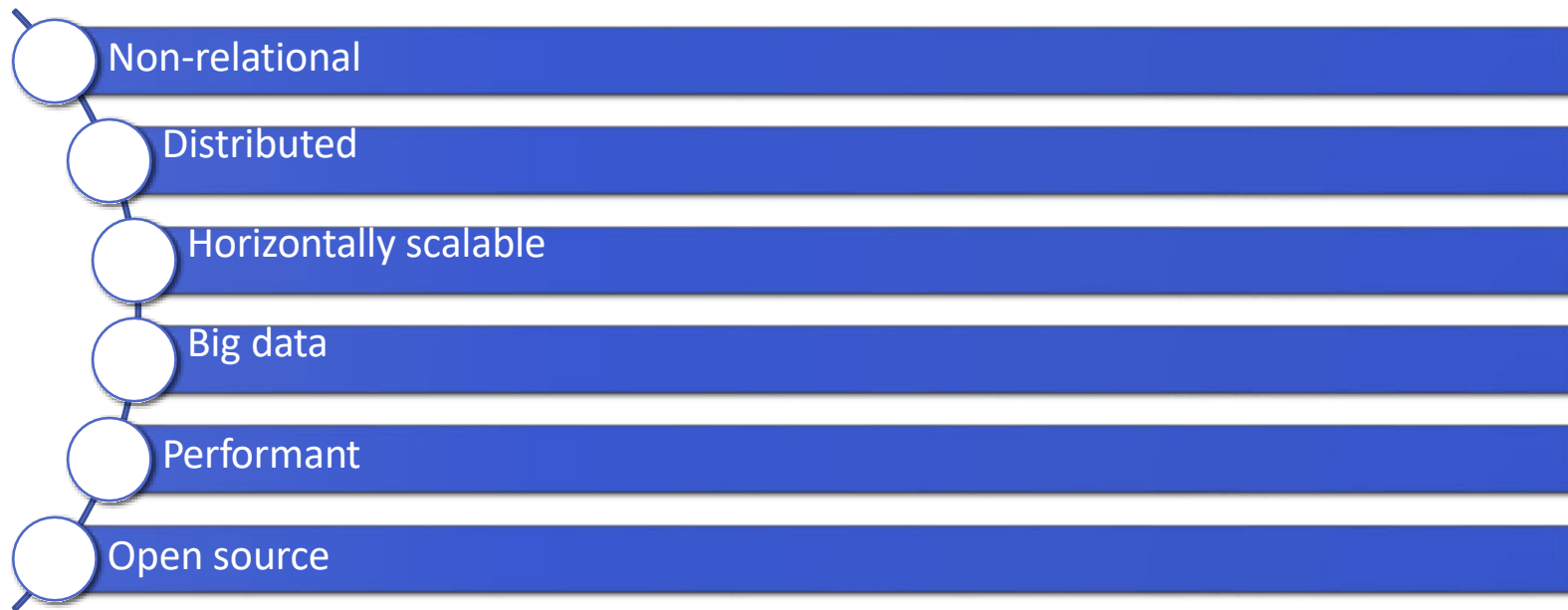
Need of NoSQL

- Explosion of social media sites (Facebook, Twitter, Google etc.) with large data needs. (*Sharding* is a problem)

- Rise of cloud-based solutions such as Amazon S3 (simple storage solution).

- Just as moving to dynamically-typed languages (Ruby/Groovy), a shift to dynamically-typed data with frequent schema changes.

- Expansion of Open-source community.

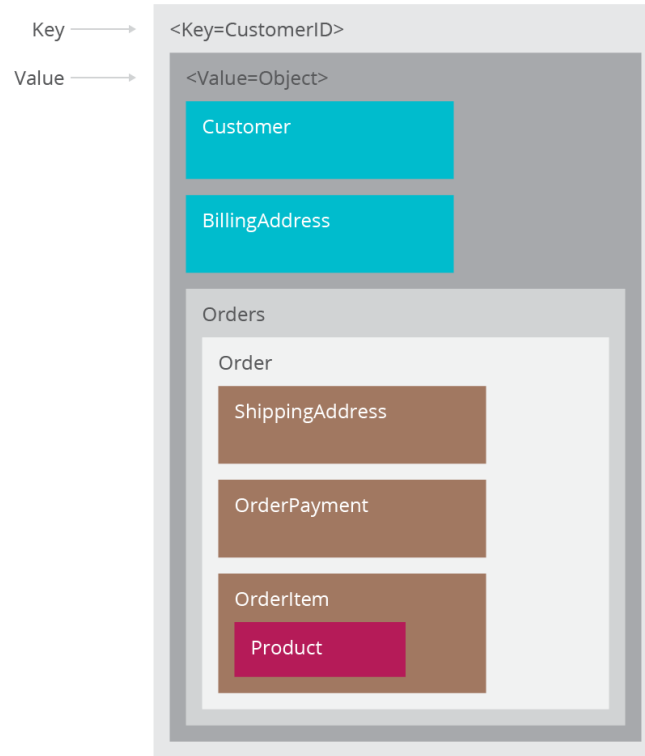- NoSQL solution is more acceptable to a client now than years ago.

NoSQL Types

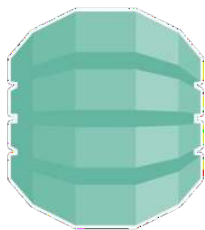NoSQL database are classified into four types:

- Key Value pair based
- Column based
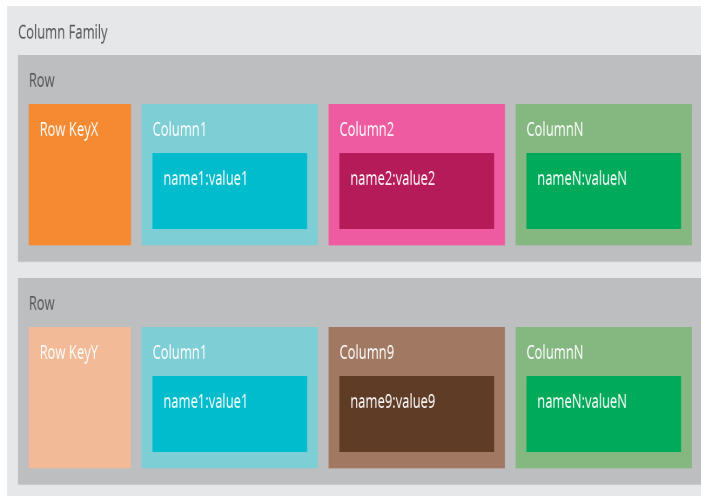- Document based
- Graph based

Key Value Pair Based

Key → <Key=CustomerID>

Value → <Value=Object>

Customer

BillingAddress

Orders

Order

ShippingAddress

OrderPayment

OrderItem

Product

Key-value store.
Implementations

Column based

Column Family

Row

Row KeyX	Column1	Column2	ColumnN
	name1:value1	name2:value2	nameN:valueN

Row

Row KeyY	Column1	Column9	ColumnN
	name1:value1	name9:value9	nameN:valueN

Column store.

Implementations

Document Based

<Key=CustomerID>
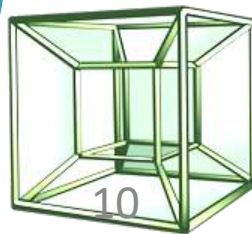
```json
{
    "customerid": "fc986e48ca6"          ←———————— Key
    "customer":
    {
    "firstname": "Pramod",
    "lastname": "Sadalage",
    "company": "ThoughtWorks",
    "likes": [ "Biking","Photography" ]
    }
    "billingaddress":
    { "state": "AK",
       "city": "DILLINGHAM",
       "type": "R"
     }
}
```

Document store. Characteristics

PROS

CONS

Flexible

Object in single document

No joins

Rich querying capabilities
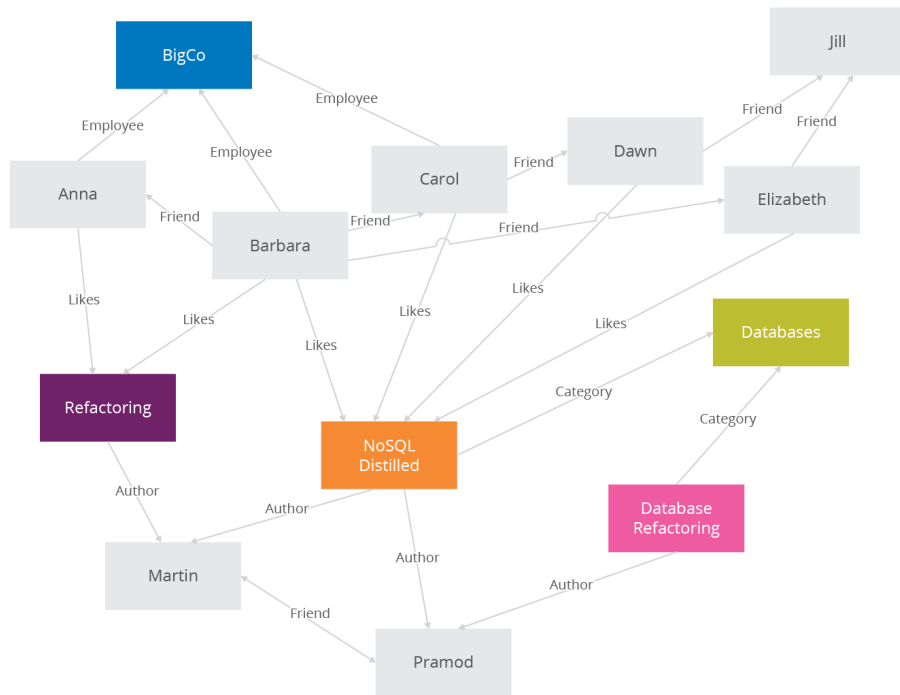
Document store.

Implementations

Graph Based

Graph store.
Implementations

TOP 4 Systems

1	→	MongoDB	Document
2	→	Cassandra	Column + key-value
3	→	Redis	In-memory key-value
4	→	Elasticsearch	Document (search engine)

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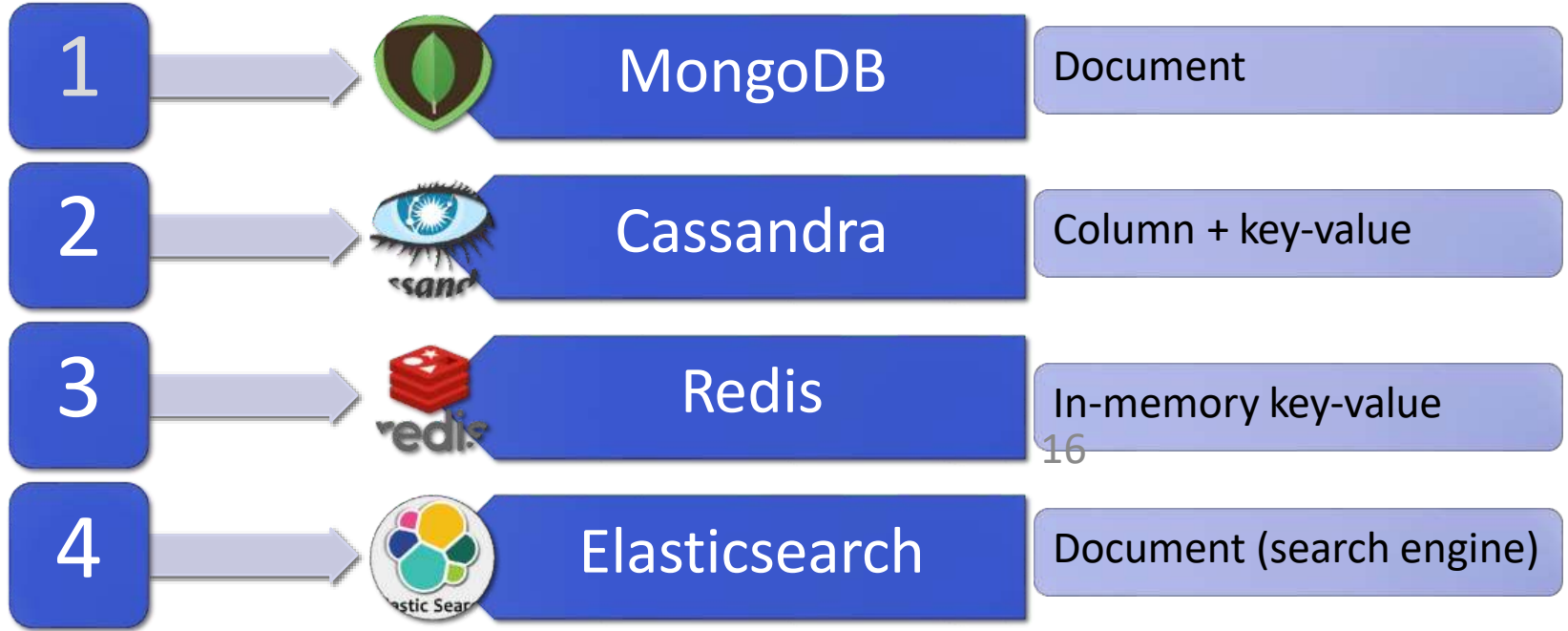
Mongo DB

MongoDB vs SQL performance chart

Tak