Data Modeling Introduction

Data in MongoDB has a flexible schema.

MongoDB's collections do not enforce document structure.

Flexibility in MongoDB facilitate the mapping of documents to an entity or an object.

The key challenges in data modelling:

- Balancing the needs of application.
- Performance characteristics of the database engine.
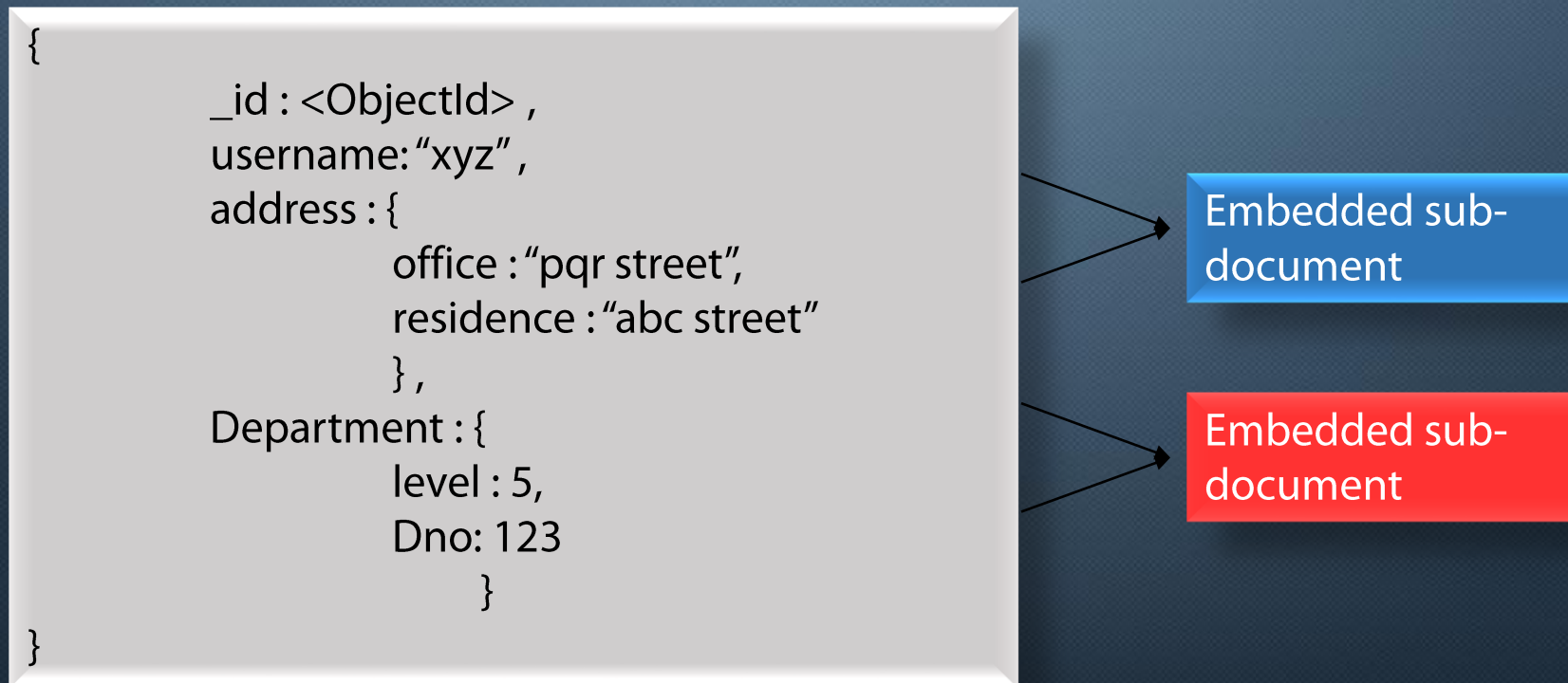- Data retrieval patterns.

Data Model Design

❑ The key decision in designing data models for MongoDB applications revolves around the structure of documents and how the application represents relationships between data.

❑ There are two tools that allow applications to represent these relationships:

Data Model Design

References

Embedded documents
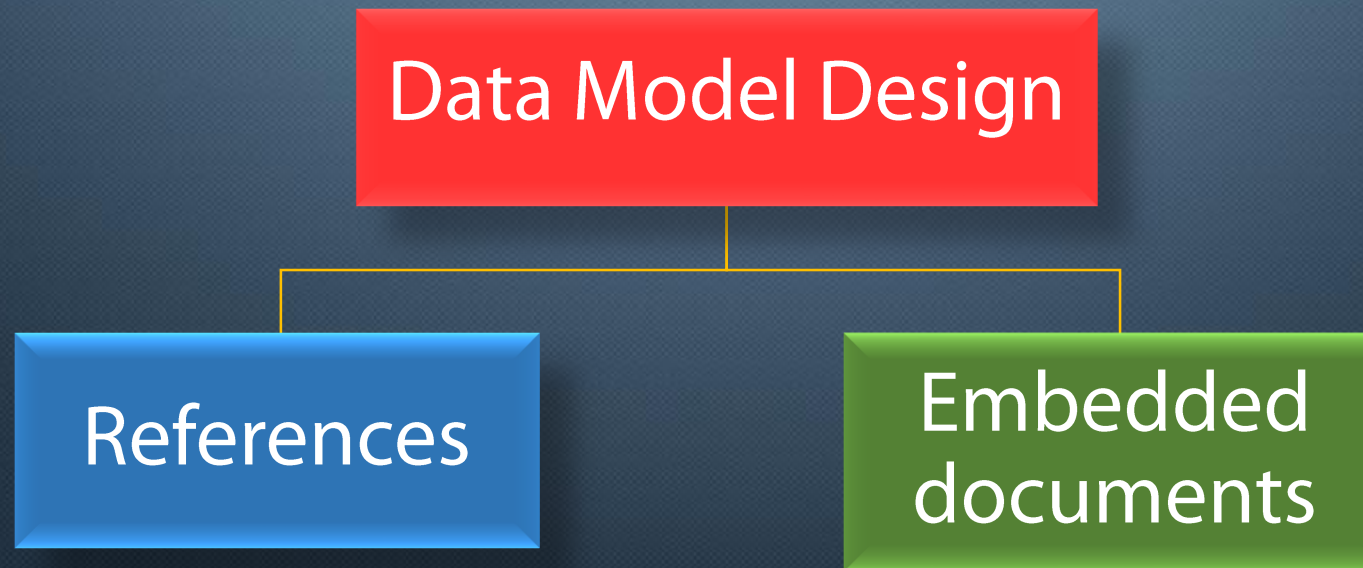
Embedded Data

- With MongoDB, you may embed related data in a single document allowing applications to store related pieces of information in the same database record.

- As a result, applications may need to issue fewer queries and updates to complete common operations.

```
{
        _id : <ObjectId> ,
        username: "xyz" ,
        address : {
                office : "pqr street",
                residence : "abc street"
                } ,
        Department : {
                level : 5,
                Dno: 123
                        }
}
```

Embedded sub-document

Embedded sub-document

Normalized Data Models

- Normalized data models describe relationships using references between documents.

- References store the relationships between data by including references from one document to another. Applications can resolve these references to access the related data.

User Document

```
{

    _id : <ObjectId1>,
    name: "xyz"

}
```

Department Document

```
{

            _id:<ObjectId2>,
            _id:<ObjectId1>,
            Deptname: "science"

}
```

Contact Document

```
{

            _id:<ObjectId3>,
            _id:<ObjectId1>,
            address: "pqr street",
            "mobileno":9876789678

}
```

Operational Factors and Data Models

Modeling application data for MongoDB depends on both the data itself, as well as the characteristics of MongoDB itself.

Atomicity

Sharding

Indexes

Document growth

Data Lifecycle Managements

Large Number of collections