

MongoDB – Data Models & Data Types

MongoDB make data survive in flexible schema model. In RDBMS, it is must to create table's schema before inserting data, but here in Mongodb Collections dontenfore document structure.

What are key requirements for any application?

- Performance of database engine during query execution and ease of retrieval of data. Hence the data model should be very important in the application use of data.
- Here everything revolves around documents and their relationships. For this there are 2 types of data models.
 1. Normalized data models
 2. Embedded data models

Normalized Data Model:

- Normalized data model allows us to depict the relationships using references between documents.
- Let us consider the below example where in this normalized data model, the Customer delivery address document contains a reference to the Cust_id document.

Example:

```
{
  _id: "123",
  Customer_name: "Maria",
}
{
  Cust_id:"123"
  street: "123 street",
  city: "london",
  state: "UK",
  zip: "12345"
}
```

These Models can be used in below cases:

- When embedding resulting in duplication of data.

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- When you need to model large hierarchical data sets and complex many-to-many relationships.

Embedded Data Model:

- Embedded data model allows us to store the relative information coupled together in the same database record. Hence, the applications may need less number of queries to completed regular operations.
- Let us consider the below example again as if the customer delivery address data is frequently retrieved with the customer information, then instead of shooting multiple queries to resolve the reference. The better data model should be to embed the customer delivery address data within the single document.

```
{
  _id: "123",
  Customer_name: "Maria",
}
{
  Cust_id:"123"
  street: "123 street",
  city: "london",
  state: "UK",
  zip: "12345"
}
```

These Models can be used in below cases:

- When you have “contains” relationships between entities (one-to-one).
- When you have “many” or child documents can be enclosed as one (one-to-many).

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- It is known that the MongoDB stores the JSON data in a binary encoded format called BSON, where JSON data model actually extends the BSON in order to provide more flexibility with the additional data types and helps in easily encoding and decoding the data across various programming languages.
- By default, there is no support for the data types like date in JSON. But, BSON provides that feature.
- MongoDB supports the below list of data types.
- Each data type in MongoDB possess a unique number.

Datatype	Number	Description
Double	1	Used to stored floating point values
String	2	Commonly used datatype and it is UTF-8 valid
Object	3	Used for storing embedded objects
Array	4	Used for storing embedded objects
Binary Data	5	Used to store binary data
Undefined	6	Used to store undefined value
Object Id	7	Used to store document's ID
Boolean	9	Used to store Boolean value

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Date	10	Used to store current date time in UNIX format.
Null	11	Used to store null value
Regular Expression	12	Used to store regex
Javascript	13	Used to store JavaScript data without scope
Symbol	14	Basically used to store string, but reserved for languages that use specific symbol
Javascript with scope	15	Used to store JavaScript data with scope
Integer	16&18	Used to store numerical value
Timestamp	10	Used to track when a document is modified.
Min/Max Key	255/127	Used to compare value against lowest and highest BSON elements