

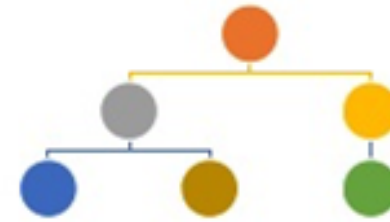
5602201

6. Document Model: Basic Concepts

CHUTIPORN ANUTARIYA

Document Model and Mongo DB

Document Model



A specialized Key-value Store

Designed for storing, retrieving and managing document-oriented information, also known as [semi-structured data](#), such as XML, JSON, BSON

Provides a query/update language that exposes the ability to query or update based on the internal structure in the document.

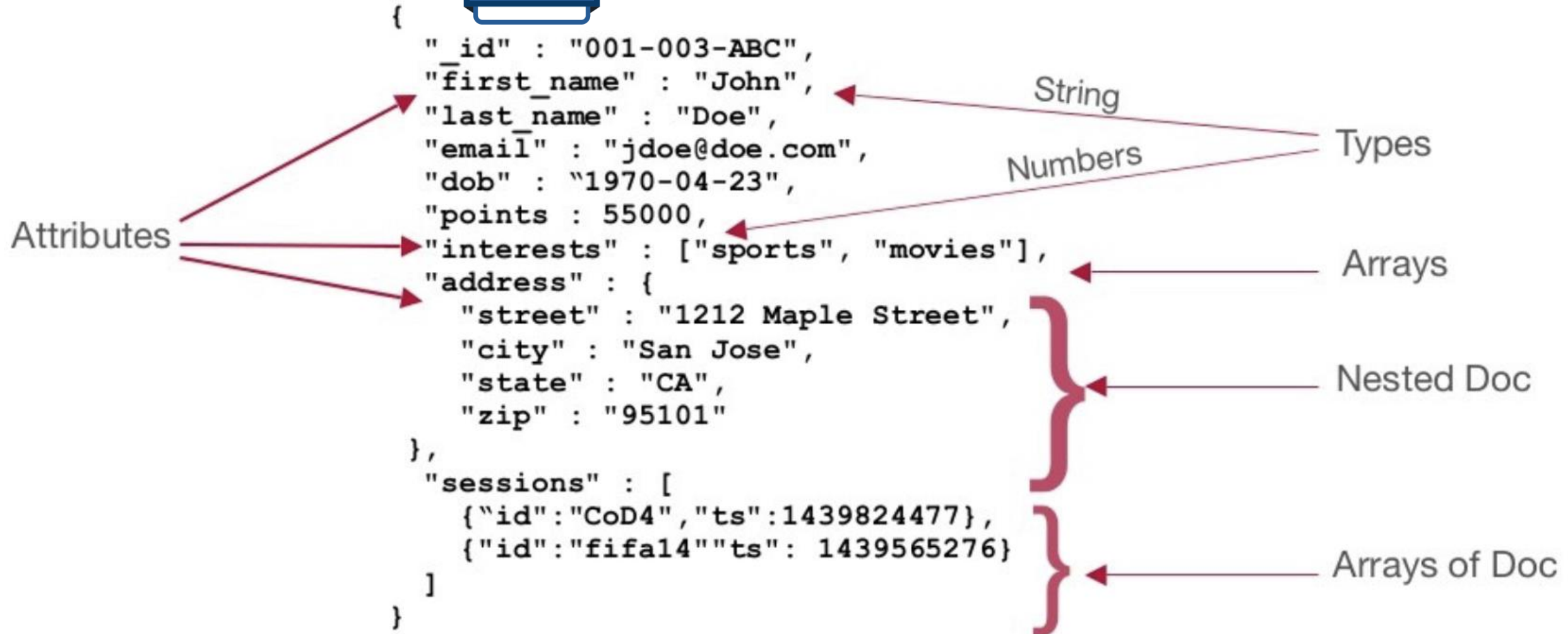
Flexible Schema



- Support Data Types
- Complex Data Structure
- Developer Friendly
- Flexible

```
{
  "_id" : "001-003-ABC",
  "first_name" : "John",
  "last_name" : "Doe",
  "email" : "jdoe@doe.com",
  "dob" : "1970-04-23",
  "points" : 55000,
  "interests" : ["sports", "movies"],
  "address" : {
    "street" : "1212 Maple Street",
    "city" : "San Jose",
    "state" : "CA",
    "zip" : "95101"
  },
  "sessions" : [
    {"id": "CoD4", "ts": 1439824477},
    {"id": "fifa14", "ts": 1439565276}
  ]
}
```

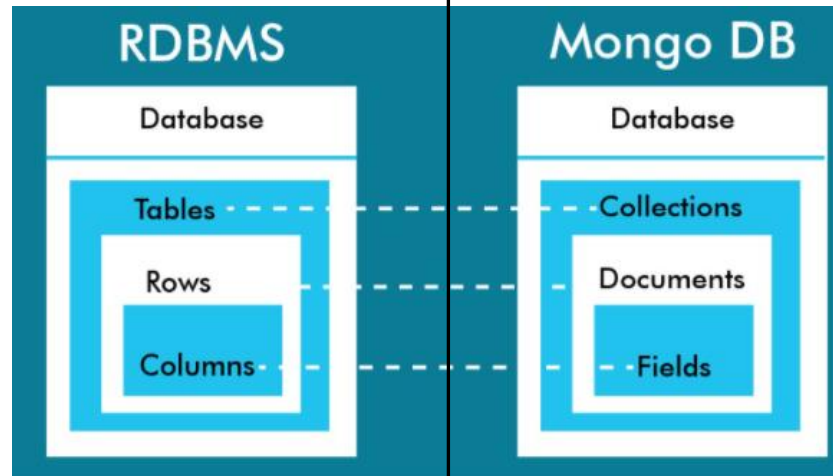
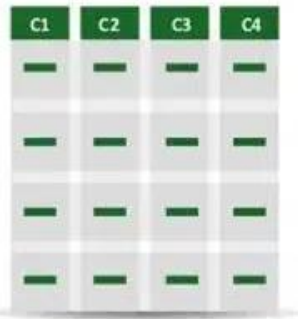
Flexible Schema



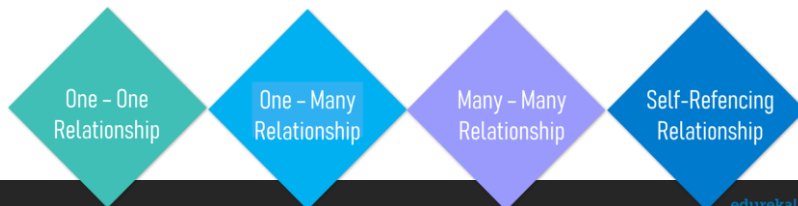
RDBMS vs. Document - What's the difference

Relational data model

A Table



Relationship : PK, FK, JOIN



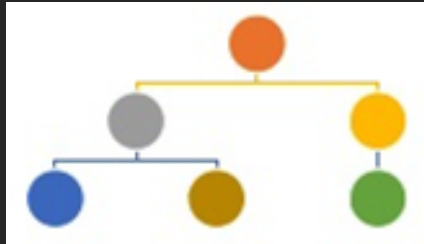
Document data model

A Collection



Relationship: embedded & linking, multi-value field types

CRUD Operations



Creation (or
insertion)

Retrieval (or
query,
search, read
or find)

Update (or
edit)

Deletion (or
removal)

About Document Model



Stores data in flexible, JSON-like documents





Fields can vary from document to document and data structure can be changed over time








Queries, indexing, and aggregation



Flexible Schema in Action

Best Sellers View  




Showing 10 items Sort By **Best selling**




 Vitus Bikes Sommet VR Suspension Bike 2015 ★★★★★ 5 Reviews \$2312.99 RRP \$3153.99 SAVE 27% -- SELECT OPTION -- BUY	 Vitus Bikes Escarpe 290 PRO Suspension Bike 2015 ★★★★★ 1 Reviews \$3903.49 RRP \$5677.49 SAVE 31% -- SELECT OPTION -- BUY	 Cube Agree GTC Triple Road Bike 2014 ★★★★★ 8 Reviews \$1082.99 RRP \$1890.99 SAVE 43% -- SELECT OPTION -- BUY
--	--	---

 Pinarello Marvel T2 Athena Road Bike 2014 ★★★★★ \$2891.49 - \$2949.99 RRP \$5204.49 - \$5309.99 SAVE UP TO 44% -- SELECT OPTION -- BUY	 Cube Agree GTC Race Compact Road Bike 2015 ★★★★★ 5 Reviews \$2022.49 RRP \$2206.49 SAVE 8% -- SELECT OPTION -- BUY	 Colnago AC-R - Ultegra Road Bike 2015 ★★★★★ \$2674.49 RRP \$3942.49 SAVE 32% -- SELECT OPTION -- BUY
---	--	---

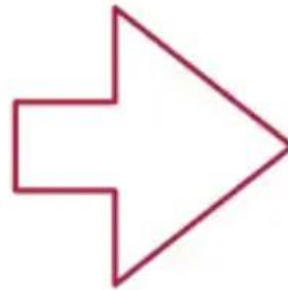
Best Sellers View  

Showing 1 - 48 of 100 Sort By **Best selling**

 RockShox Reverb Seatpost ★★★★★ 221 Reviews \$269.99 RRP \$460.00 SAVE 41% -- SELECT OPTION -- BUY	 Chain Reaction Cycles Gift Voucher ★★★★★ 88 Reviews \$1.00 - \$200.00 -- SELECT OPTION -- VIEW	 Evoc Bike Travel Bag 280L ★★★★★ 28 Reviews \$450.00 - \$490.00 RRP \$475.00 - \$490.00 SAVE UP TO 5% -- SELECT OPTION -- BUY
--	---	--

 Continental Grand Prix 4000S II Road Tyre - 25c PAIR ★★★★★ 27 Reviews \$99.99 RRP \$157.99 SAVE 37% -- SELECT OPTION -- BUY	 RockShox Reverb Stealth Seatpost ★★★★★ 77 Reviews \$314.99 - \$329.99 RRP \$544.00 - \$551.99 SAVE UP TO 42% -- SELECT OPTION -- BUY	 Shimano Ultegra 6700 10 Speed Road Cassette ★★★★★ 160 Reviews \$44.99 RRP \$89.99 SAVE 50% -- SELECT OPTION -- BUY
---	---	--

Product Catalog - RDBMS



“Entity Value Attribute” Pattern

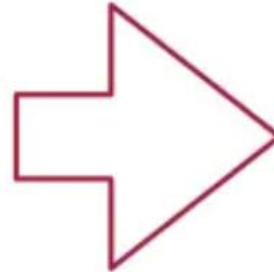
```
SELECT * FROM (
  SELECT
    ce.sku,
    ea.attribute_id,
    ea.attribute_code,
    CASE ea.backend_type
      WHEN 'varchar' THEN ce_varchar.value
      WHEN 'int' THEN ce_int.value
      WHEN 'text' THEN ce_text.value
      WHEN 'decimal' THEN ce_decimal.value
      WHEN 'datetime' THEN ce_datetime.value
      ELSE ea.backend_type
    END AS value,
    ea.is_required AS required
  FROM catalog_product_entity AS ce
  LEFT JOIN eav_attribute AS ea
    ON ce.entity_type_id = ea.entity_type_id
  LEFT JOIN catalog_product_entity_varchar AS ce_varchar
    ON ce.entity_id = ce_varchar.entity_id
    AND ea.attribute_id = ce_varchar.attribute_id
    AND ea.backend_type = 'varchar'
  LEFT JOIN catalog_product_entity_text AS ce_text
    ON ce.entity_id = ce_text.entity_id
    AND ea.attribute_id = ce_text.attribute_id
    AND ea.backend_type = 'text'
  LEFT JOIN catalog_product_entity_decimal AS ce_decimal
    ON ce.entity_id = ce_decimal.entity_id
    AND ea.attribute_id = ce_decimal.attribute_id
    AND ea.backend_type = 'decimal'
  LEFT JOIN catalog_product_entity_datetime AS ce_datetime
    ON ce.entity_id = ce_datetime.entity_id
    AND ea.attribute_id = ce_datetime.attribute_id
    AND ea.backend_type = 'datetime'
  WHERE ce.sku = 'rp-prod132546'
) AS tab
WHERE tab.value != '';
```

To get a single product

Product Catalog – NoSQL/Document

```
{
  "_id" : "rp-prod132546",
  "name" : "Marvel T2 Athena",
  "brand" : "Pinarello",
  "category" : "bike",
  "type" : "Road Bike",
  "price" : 2949.99,

  "size" : "55cm",
  "wheel_size" : "700c",
  "frameset" : {
    "frame" : "Carbon Toryaca",
    "fork" : "Onda 2V C"
  },
  "groupset" : {
    "chainset" : "Camp. Athena 50/34",
    "brake" : "Camp."
  },
  "wheelset" : {
    "wheels" : "Camp. Zonda",
    "tyres" : "Vittoria Pro"
  }
}
```



```
products
  .findById("rp-prod132546")
```

Store the product “as a business object”

To get a single product

Easy Variation with Document

```
{
  "_id" : "rp-prod132546",
  "name" : "Marvel T2 Athena",
  "brand" : "Pinarello",
  "category" : "bike",
  "type" : "Road Bike",
  "price" : 2949.99,

  "size" : "55cm",
  "wheel_size" : "700c",
  "frameset" : {
    "frame" : "Carbon Toryaca",
    "fork" : "Onda 2V C"
  },
  "groupset" : {
    "chainset" : "Camp. Athena 50/34",
    "brake" : "Camp."
  },
  "wheelset" : {
    "wheels" : "Camp. Zonda",
    "tyres" : "Vittoria Pro"
  }
}
```

```
{
  "_id" : "rp-prod106702",
  "name" : " Ultegra SPD-SL 6800",
  "brand" : "Shimano",
  "category" : "pedals",
  "type" : "Components",
  "price" : 112.99,

  "features" : [
    "Low profile design increases ...",
    "Supplied with floating SH11 cleats",
    "Weight: 260g (pair)"
  ]
}
```

```
{
  "_id" : "rp-prod113104",
  "name" : "Bianchi Pride Jersey SS15",
  "brand" : "Nalini",
  "category" : "Jersey",
  "type" : "Clothing",
  "price" : 76.99,

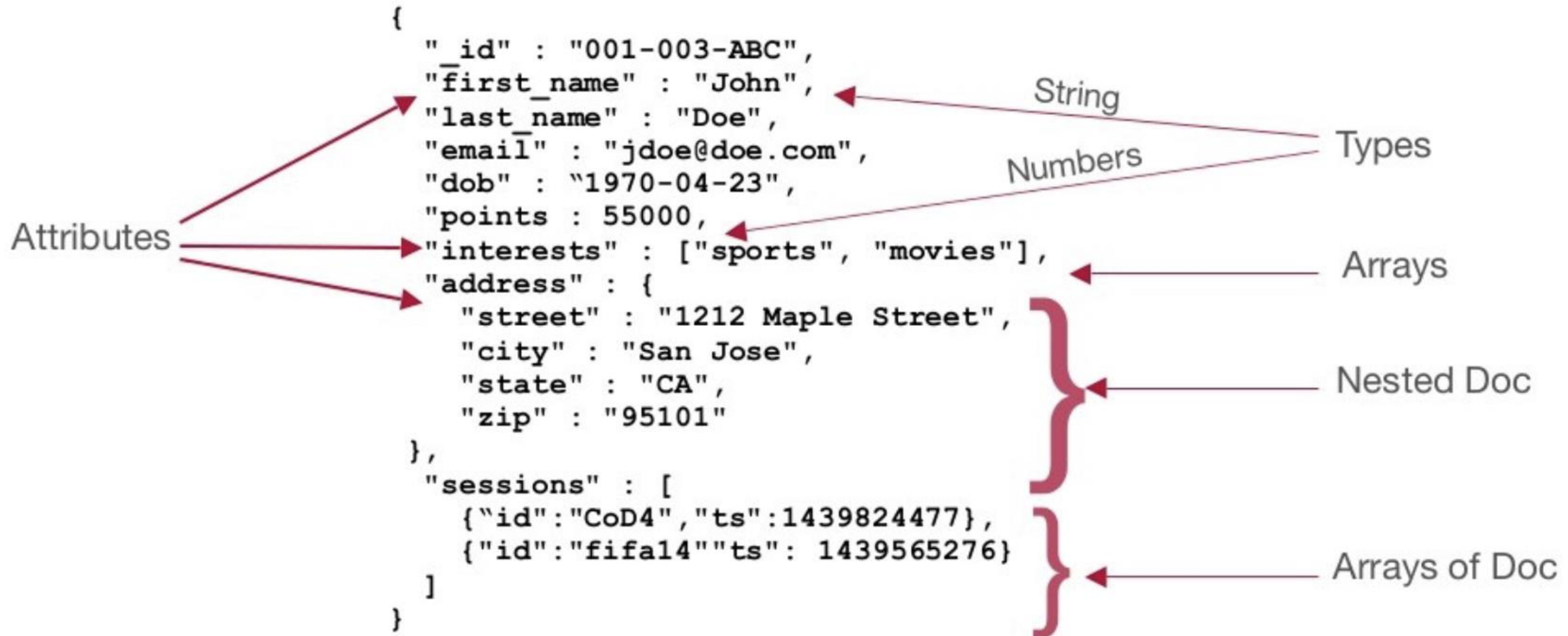
  "features" : [
    "100% Polyester",
    "3/4 hidden zip",
    "3 rear pocket"
  ],
  "color" : "black"
}
```


Flexible Schema

- Support Data Types
- Complex Data Structure
- Developer Friendly
- Flexible

```
{
  "_id" : "001-003-ABC",
  "first_name" : "John",
  "last_name" : "Doe",
  "email" : "jdoe@doe.com",
  "dob" : "1970-04-23",
  "points" : 55000,
  "interests" : ["sports", "movies"],
  "address" : {
    "street" : "1212 Maple Street",
    "city" : "San Jose",
    "state" : "CA",
    "zip" : "95101"
  },
  "sessions" : [
    {"id":"CoD4","ts":1439824477},
    {"id":"fifa14","ts": 1439565276}
  ]
}
```

Flexible Schema



Add feature easily

Requirement: "users can vote and comment product"

```
{
  "_id" : "rp-prod113104",
  "name" : "Bianchi Pride Jersey SS15",
  "brand" : "Nalini",
  "category" : "Jersey",
  "type" : "Clothing",
  "price" : 76.99,
  "features" : [
    "100% Polyester",
    "3/4 hidden zip",
    "3 rear pocket"
  ],
  "color" : "black",
  "comments" : [{...}, {...}],
  "ratings" : [{..., "value" : 5}, {..., value : 3}],
  "rating" : 4
}
```

Done: just store the data!
Means less time to market

How to model this in JSON?

Size: **12"**

Infield/Outfield/Pitcher model

2-Piece Web pattern

Most popular MLB® pattern among pitchers

Pro Stock® American steerhide leather offers rugged durability and a superior feel

Dual-Welting™ on "exposed edges" of the fingers helps maintain pocket shape and durability

Pro Stock™ hand-designed pattern for unbeatable craftsmanship

Dri-Lex® ultra-breathable wrist lining repels moisture from your hand

Black leather with rich brown embellishments

Pattern: **B212**

Model: **WTA2000BBB212**

Wilson



JSON Object



Documents are Rich Structures

```
{  
  category: "glove",  
  model: "PRO112PT",  
  name: "Air Elite",  
  brand: "Rawlings",  
  price: 229.99,  
  available: Date("2013-03-31"),  
  position: ["infield", "outfield", "pitcher"]  
}
```



Fields can contain arrays

Documents are Rich Structures

```
{  
  category: "glove",  
  model: "PRO112PT",  
  name: "Air Elite",  
  brand: "Rawlings",  
  price: 229.99,  
  available: Date("2013-03-31"),  
  position: ["infield", "outfield", "pitcher"],  
  endorsed: {name: "Ryan Howard",  
             team: "Phillies",  
             position: "first base"},  
  history: [{date: Date("2013-03-31"), price: 279.99},  
            {date: Date("2013-06-01"), price: 259.79},  
            {date: Date("2013-08-15"), price: 229.99}]  
}
```

} Fields can contain an array of sub-documents

Variation is Easy!

```
{  
  
  category: bat,  
  model: B1403E,  
  name: Air Elite,  
  brand: "Rip-IT",  
  price: 399.99  
  
  diameter: "2 5/8",  
  barrel: R2 Alloy,  
  handle: R2 Composite,  
  type: composite,  
}
```

```
{  
  
  category: glove,  
  model: PRO112PT,  
  name: Air Elite,  
  brand: "Rawlings",  
  price: "229.99"  
  
  size: 11.25,  
  position: outfield,  
  pattern: "Pro taper",  
  material: leather,  
  color: black  
}
```

```
{  
  
  category: ball,  
  model: ROML,  
  name: MLB,  
  brand: "Rawlings",  
  price: "6.99"  
  
  cover: leather,  
  core: cork,  
  color: white  
}
```

Easy Query! (MongoDB Query)

```
> db.products.find( { "position" : "infield",  
                      "endorsed.team" : "Phillies" } )  
  
{  
  category: "glove",  
  model: "PRO112PT",  
  name: "Air Elite",  
  brand: "Rawlings",  
  price: 229.99,  
  available: Date("2013-03-31"),  
  position: ["infield", "outfield", "pitcher"],  
  endorsed: {name: "Ryan Howard",  
             team: "Phillies",  
             position: "first base"},  
}
```




THANK YOU