



## The Decision-Maker's Guide to FHIR

Buy off-the-shelf, partner up, or build it yourself?

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### The Benefits of FHIR

HL7 FHIR (Fast Healthcare Interoperability Resources) is a data standard that promotes secure and easy healthcare information sharing.



Use out-of-the-box interoperability resources or adapt them



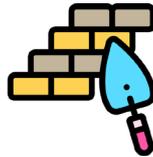
RESTful framework for information exchange



A focus on fast and easy implementation



Evolutionary development path from HL7 Version 2 and CDA



Strong foundation in web standards



Multiple implementation libraries available to kick-start development



Concise and easily understood specifications



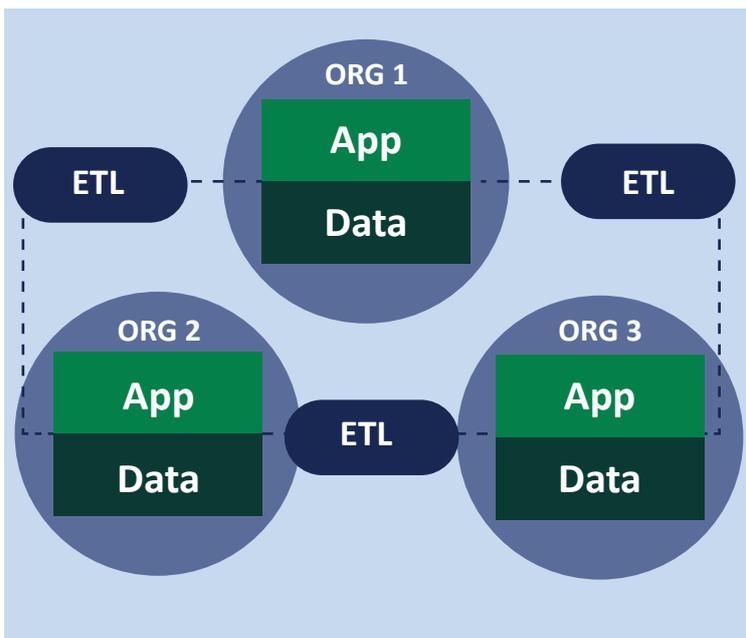
Specification is free for use with no restrictions



A human-readable serialization format for ease of use by developers

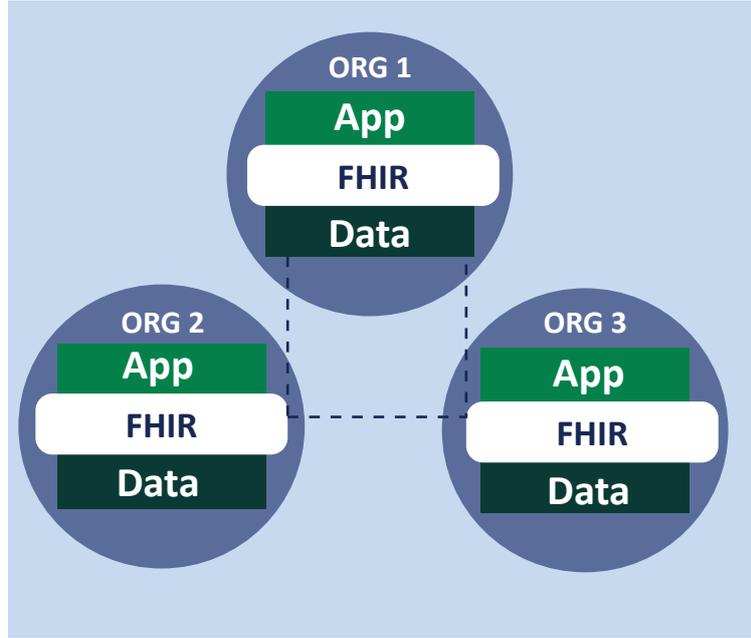
FHIR provides a new way to share and manage data simplifying development, reducing data silos, and ultimately moving healthcare to an interoperable model.

Without FHIR



Without FHIR, complex and costly ETL jobs are required to copy and transform the data before it can be used

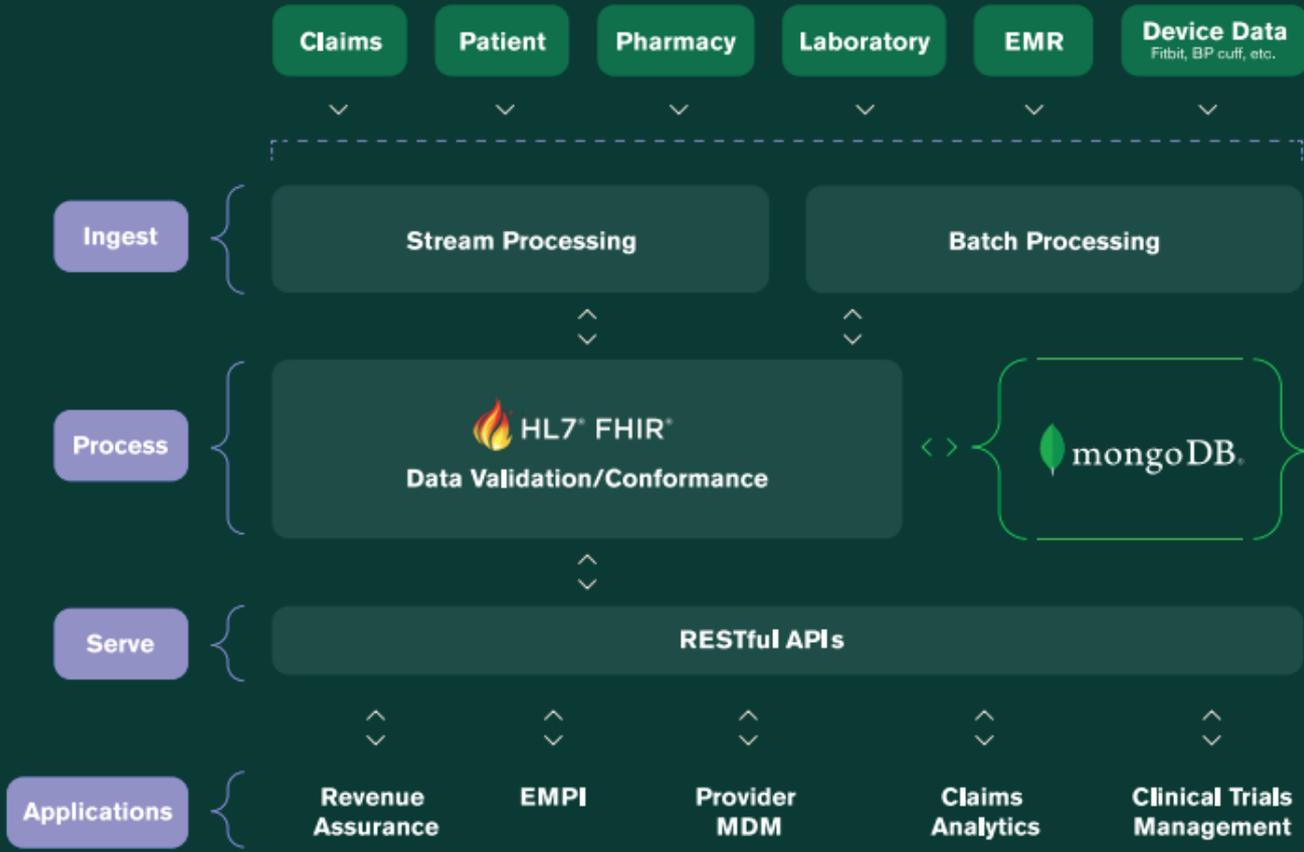
With FHIR



Shared data is managed and made available via a common FHIR REST API layer and database

## FHIR Architecture Fundamentals

Your FHIR solution typically contains four layers:

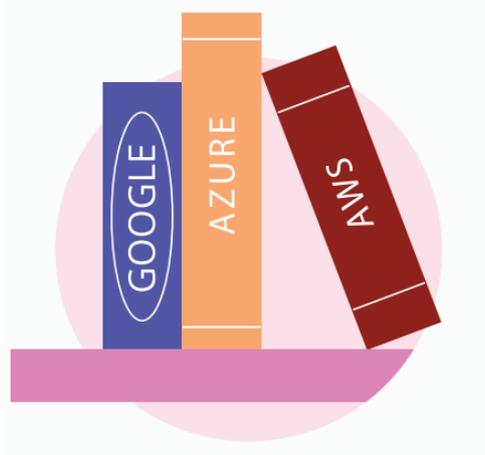


For decision-makers, your FHIR solution comes down to one of three options:

### Build It Yourself

Build your own FHIR solution, including the API. Best for large organizations with experienced development teams.

Although this option offers unlimited flexibility, wouldn't your teams be better off developing customer-facing apps and services, rather than maintaining your FHIR solution?



### Use Off-the-Shelf Software

Google Cloud Healthcare API, Microsoft Azure API for FHIR, and AWS FHIR Works all offer FHIR API and database solutions.

This can be the fastest way to spin up your FHIR solution, but there are drawbacks:

- Cloud only (no on premises)
- Vendor lock-in and no multi-cloud flexibility
- Limited access to underlying database
- New application and/or custom development might be limited

### Use a Customizable Turnkey Solution

The middle ground between off-the-shelf and build it yourself. Combine a purpose-built API and the ideal database for FHIR, MongoDB, gaining:

- Deployment flexibility (on premises, cloud, multi-cloud)
- Integration with legacy systems
- Flexibility to develop additional solutions on top of your data



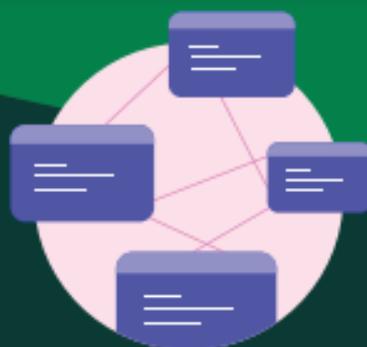
**EXAFLUENCE**  
Data Driven Influence

For an all-in-one FHIR solution, MongoDB has partnered with FHIR experts Exafluence to offer:

- Support for real-time and batch-data ingestion
- Smart integration with automated mapping to the native FHIR format
- Flexible deployment options [multi-cloud, on-premises]
- Native FHIR data in MongoDB to extend and build to suit your business

# To get the most from FHIR and truly embrace interoperability, the data platform you choose must natively support FHIR's JSON data format.

This makes MongoDB's document data model, with its native JSON support, an ideal FHIR companion.



## Tabular (Relational) Data Model

Related data split across multiple records and tables, resulting in:

- Rigid and inflexible schema
- Complexity in understanding the data
- Increased processing overhead
- Query complexity



## Document Data Model

Related data contained in a single, rich JSON document, ensuring:

- JSON in
- JSON stored
- JSON queried
- JSON out

```
HL7 FHIR

{
  "_id": ObjectId("5ad88534e3632e1a35a58499"),
  "name": {
    "first": "John",
    "last": "Doe",
  },
  "address": {
    "location": "work",
    "address": {
      "street": "35 Hatfields",
      "city": "London",
    },
  },
  "dob": ISODate("1977-04-01T05:00:00Z"),
  "Patient Number": NumberDecimal("1292835.75")
}
```

```
Parser

{
  "_id": ObjectId("5ad88534e3632e1a35a58499"),
  "name": {
    "first": "John",
    "last": "Doe",
  },
  "address": {
    "location": "work",
    "address": {
      "street": "35 Hatfields",
      "city": "London",
    },
  },
  "dob": ISODate("1977-04-01T05:00:00Z"),
  "Patient Number": NumberDecimal("1292835.75")
}
```



```
Query Parser

{
  "_id": ObjectId("5ad88534e3632e1a35a58499"),
  "name": {
    "first": "John",
    "last": "Doe",
  },
  "address": {
    "location": "work",
    "address": {
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      "city": "London",
    },
  },
  "dob": ISODate("1977-04-01T05:00:00Z"),
  "Patient Number": NumberDecimal("1292835.75")
}
```

Application



Database



Application

```
Document

{
  "_id": ObjectId("5ad88534e3632e1a35a58499"),
  "name": {
    "first": "John",
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Application

Database

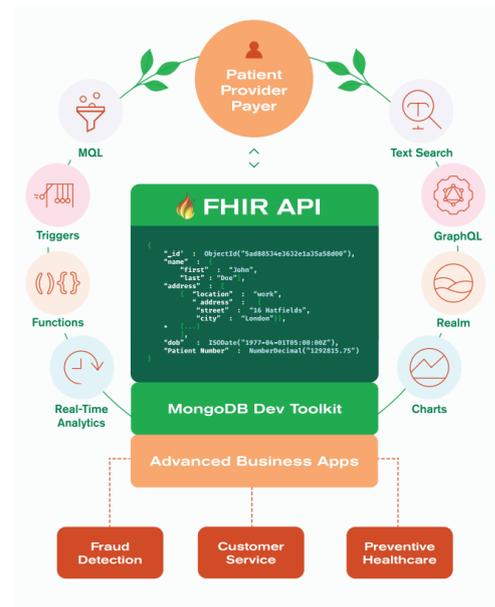
Application

# MongoDB:

## Do more with your FHIR data

Why buy and build a technology that's already a part of the underlying MongoDB platform?

Use MongoDB's toolset to develop value-add business solutions on the FHIR-native dataset without ETL



## MongoDB and MongoDB Atlas:

### FHIR from the cloud to the edge and on premises

With native JSON support, as well as ad hoc queries, indexing, and real-time aggregation to access and analyze your data, MongoDB is uniquely suited to FHIR and an interoperable future.

And with MongoDB Atlas, MongoDB's global cloud database service, your FHIR applications and data are free to work across multiple clouds.



### Rapid FHIR

The fastest way to build FHIR applications



### Multi-Cloud

Have the best of all clouds and distribute FHIR data and applications on AWS, Google Cloud, and Microsoft Azure



### HIPAA

MongoDB Atlas is HIPAA ready and supports the latest in end-to-end encryption



### Patient 360

Create a single view of the patient from disparate databases, systems, and data formats

Find out more at [ExfHealth.io](https://ExfHealth.io)

[Learn More](#)